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APPLICATION OF THE ECOSYSTEM DIAGNOSIS AND TREATMENT METHOD TO THE GRANDE RONDE MODEL WATERSHED PROJECT

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PREFACE

The results of the first phase of the GREDT project were reported in three documents: A "Recommendations" report, a "Template for Project Planning Status Report", and a Progress Report. This document replaces the Recommendations and Progress Reports. The recommendations put forth in the first report are included in Part I of this document without significant change. The Template Project Status Report, which shows how an annual planning report is structured, is a stand alone piece which is not incorporated here. The contents of the Progress Report have been updated and expanded into the methods (Part II) and results sections (Part III) of this report. The phase one Progress Report covered the upper portion of the Grande Ronde basin only, this report covers all of the Grande Ronde and Imnaha basins.

The data and information included in this analysis were obtained from numerous sources. Lengths and widths for individual reaches were obtained from the StreamNet database and checked against Oregon State Resource maps. Seasonal and historic variations in width were provided by Mr. Boyd Hadden, former water master in the basin. Studies and reports dating back as far as 1845 were consulted, a bibliography is included as Appendix H. Most of the information, however was assembled through a series of workshops where biologists familiar with the streams in the basin provided input from survey records, field notes, and personal experience. The specific sources of each data item used in this report are documented in the projects electronic database. This database, which also includes the "raw data" is housed on the computers at the offices of Mobrand Biometrics Inc. awaiting transfer to a more appropriate locally accessible data keeper.

PART I. AN OVERVIEW OF THE GREDT PROJECT

In the spring of 1994 a technical planning support project was initiated by the Grande Ronde Model Watershed Board of Directors (Board) with funding from the Bonneville Power Administration. The project was motivated by a need for a science based method for prioritizing restoration actions in the basin that would promote effectiveness and accountability. In this section we recall the premises for the project. We also present a set of recommendations for implementing a watershed planning process that incorporates a science-based framework to help guide decision making. This process is intended to assist the Grande Ronde Model Watershed Board in its effort to plan and implement watershed improvement measures. The process would also assist the Board in coordinating its efforts with other entities in the region.

The planning process is based on an approach for developing an ecosystem management strategy referred to as the Ecosystem Diagnosis and Treatment (EDT) method (Lichatowich et al. 1995, Lestelle et al. 1996). The process consists of an on-going planning cycle. Included in this cycle is an assessment of the ability of the watershed to support and sustain natural resources and other economic and societal values. This step in the process, which we refer to as the diagnosis, helps guide the development of actions (also referred to as treatments) aimed at improving the conditions of the watershed to achieve long-term objectives.

The planning cycle calls for routinely reviewing and updating, as necessary, the basis for the diagnosis and other analyses used by the Board in adopting actions for implementation. The recommendations offered below address this critical need to habitually updated the information used in setting priorities for action.

PREMISES

This project and the recommendations that follow are based upon a set of premises drawn from the purpose of the model watershed program in general and the Grande Ronde Model Watershed in particular. Those premises are:

> *Ecosystem strategy* -- Watershed planning should employ a holistic approach that incorporates human economies and values, while being consistent with ecological principles that promote sustainability. The strategy should incorporate the broad range of values and objectives held by stakeholders in the Grande Ronde Basin. Although many of the initial actions may target spring chinook salmon, the scope of watershed planning is much broader. The salmon should be seen as an indicator, or diagnostic species, of the general condition of the watershed and its ability to sustain a diversity of values and objectives.
>
> *Sustainability* -- Communities generally desire that resource-based values and objectives associated with the water and land of a watershed be sustainable. These communities embrace basic land and water ethics that recognize the need for sustainability within the context of a watershed that has undergone major changes to accommodate human needs.

Therefore, land and water processes of a watershed should continue to function in a manner that can sustain both human and natural resources. If such processes are rapidly changed without regard to consequences, those resources may not be sustainable. Species like salmon that are dependent on the relative stability of those processes over a wide expanse of the watershed can therefore help us diagnose conditions for sustainability.

Scientific method -- Current understanding of how to achieve resource sustainability is limited and inadequate for meeting the challenges of growing communities and their associated needs for natural resources. Therefore, a necessary part of watershed management should be the use of the scientific method to improve understanding over time. Fundamental to this method of learning is the use of an explicit conceptual framework within which information about the system of interest is gathered, analyzed and organized. A logical linkage between actions and events within the watershed and their effect on values and objectives must be presumed and explicitly addressed. The scientific method promotes learning and assures accountability.

Adaptive Management -- Watershed management should be driven by a decision process that is based upon learning by doing, often referred to as adaptive management. This approach to decision making allows action in the face of scientific uncertainty. It serves two important functions: it provides assurance that watershed management is progressive-i.e. those actions that are effective are continued and those proven ineffective or damaging are discontinued: and it also provides the means for an open decision making process where the public has the opportunity to remain informed and participate effectively. Adaptive management requires a strong commitment to learning through research, monitoring and evaluation. Both scientific information and community values must be effectively integrated into the adaptive management decision process.

PROCESS RECOMMENDATIONS

In order to make the best use of the framework and information developed by the GREDT project, in the context of adaptive management, we offer the following four recommendations:

1. *We recommend that the Board organize its planning process so that both policy and technical roles are clearly identified and supported.*

   The watershed management process consists of both policy and technical related components (Fig. 1). The Board is responsible for policy related elements, including such items as identification of objectives, selection of actions for implementation, scheduling, and review of program performance.

   Technical support information is needed by the Board in fulfilling its functions (Fig. 1). This information needs to be organized and understood through a science-based framework. The information should be supplied to the Board by individuals qualified to perform necessary analyses and to communicate the results.

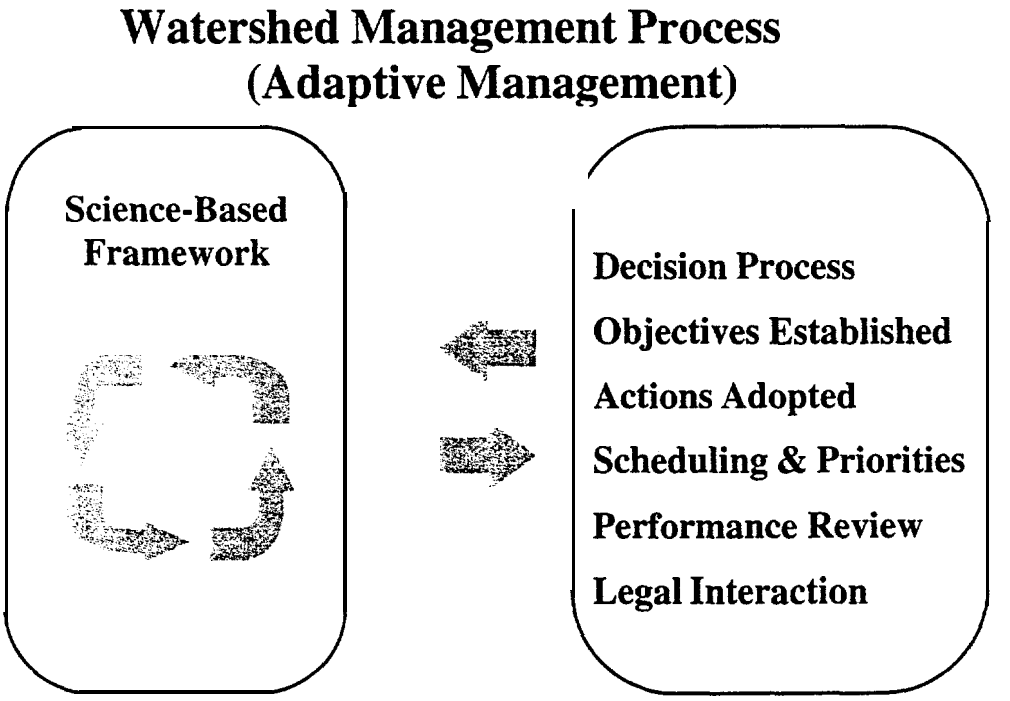


Figure 1. Technical and policy related components of Watershed Management Process.

We assume that the technical aspects of the program are to be handled by existing staff of the Grande Ronde Model Watershed Program at least in the short-term. In the future, the Board may want to consider other options for handling technical needs, such as drawing on the expertise of other governmental agencies in the region or hiring its own specialists as may be necessary.

2. *We recommend that the Board formalize an annual planning cycle, through which the Board would review the progress of the program, consider proposed actions, and adopt appropriate actions for implementation.*

Such an annual planning cycle would revolve around the Board's responsibilities for considering proposed actions and for adopting and implementing those that are selected (Fig. 2). Technical staff would supply information to the Board consistent with the annual cycle.

The planning cycle would set a schedule for accomplishing the following each year:

- Produce an annual planning report (Planning Status Report or PSR)
- Review a range of candidate actions for the upcoming year
- Prioritize candidate actions on the basis of how consistent they are with program strategies and for their expected results
- Adopt actions for implementation
- Perform an annual review of the performance of the program

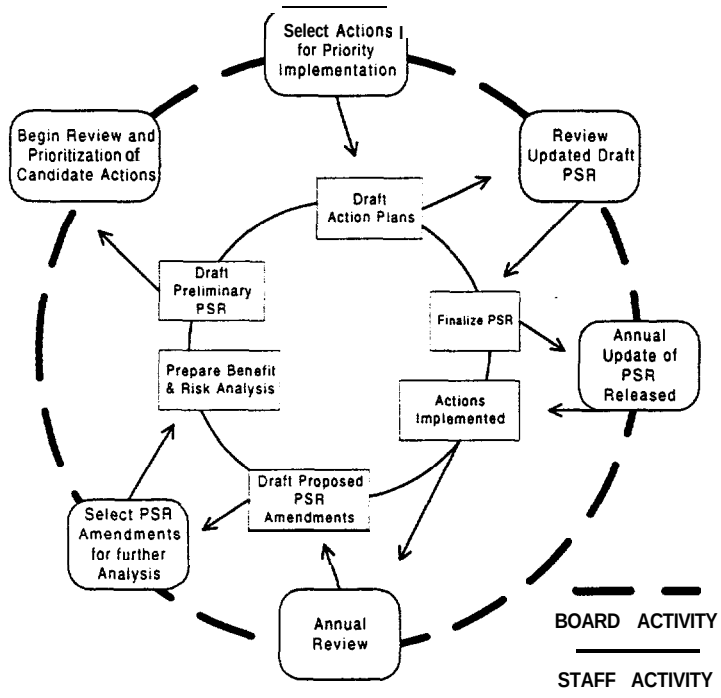


Figure 2. Annual planning and decision making cycle.

3. *We recommend that the Board modify its existing technical support activities so that staff support would include the following, consistent with the annual cycle:*

- Prepare a set of proposed actions that are developed consistent with the watershed diagnosis
- Prepare a technical analysis (including trade-offs) of all candidate actions (those based on the scientific diagnosis as well as any other proposed actions)
- Prepare drafts of the annual Planning Status Report (see Fig. 2)
- Coordinate the annual performance review
- Update analytical tools as required

4. *We recommend that a standard set of analytical tools be used in generating technical support information for the Board.*

These tools are described in detail in a BPA report titled "Applied Ecosystem Analysis - A Primer" (Lestelle et al. 1996). The tools include the following items:

- A database of information used in diagnosing watershed conditions
- An analytical model for computing productivity and capacity indices of spring chinook in the basin
- A series of graphical displays to assist in performing analyses and communicating results
- A watershed restoration strategy that incorporates the metapopulation concept to form guidelines to prioritize actions

PART II. APPROACH AND METHODOLOGY

This part of the report covers five topics: an overview of the Grande Ronde watershed; chinook salmon as a diagnostic species: the EDT approach; the data analysis methods used; and principles for prioritization of actions.

THE GRANDE RONDE WATERSHED – A Brief Orientation

The Grande Ronde Basin is located in northeastern Oregon and southeastern Washington (Fig. 3). The basin drains an area of approximately 4,000 square miles and connects to the Snake River 169 miles upstream of its mouth. The confluence of the Snake and Grande Ronde rivers is located 493 miles upstream of the mouth of the Columbia River.

The basin is characterized by rugged mountains and two major river valleys-the Grande Ronde and Wallowa valleys. The Blue Mountains and the Wallowa Mountains rise to 7,700 and 10,000 feet respectively.

The basin has a semi-arid climate. Temperatures and precipitation vary with elevation. Average annual rainfall in the valleys ranges from 12 inches to 23 inches, while at higher elevation it can exceed 50 inches. The valleys tend to have warm, dry summers and cold, moist winters (NPPC 1990).

Approximately 45 percent of the basin is public land managed by the U.S. Forest Service (NPPC 1990). Privately owned land is located primarily at lower elevations along streams and on the valley floors, Primary land uses in the basin are forest, range, and cropland.

The Grande Ronde Basin contains aquatic resources of considerable importance to local, regional, and national interests. These include approximately 2,300 miles of salmonid streams (Huntington 1994). The majority of these miles support anadromous salmonids.

Alterations of the watershed started soon after settlement in the 1860s. Agricultural development, timber harvest and mining were among the land use practices that stimulated early development and supported the growth of local communities. These activities have gradually changed the natural landscape and altered the physical and biological processes that characterized the system.

Reviews of changes that have occurred to the basin's stream system are given in West and Zakel (1993), Smith and Knox (1993), and McIntosh (1992).

CHINOOK SALMON – A Diagnostic Species

Early in this project we concluded that chinook salmon are indeed a useful indicator of watershed health. The history of chinook salmon abundance and distribution is a reflection of the changes that its environment has undergone over the past century.

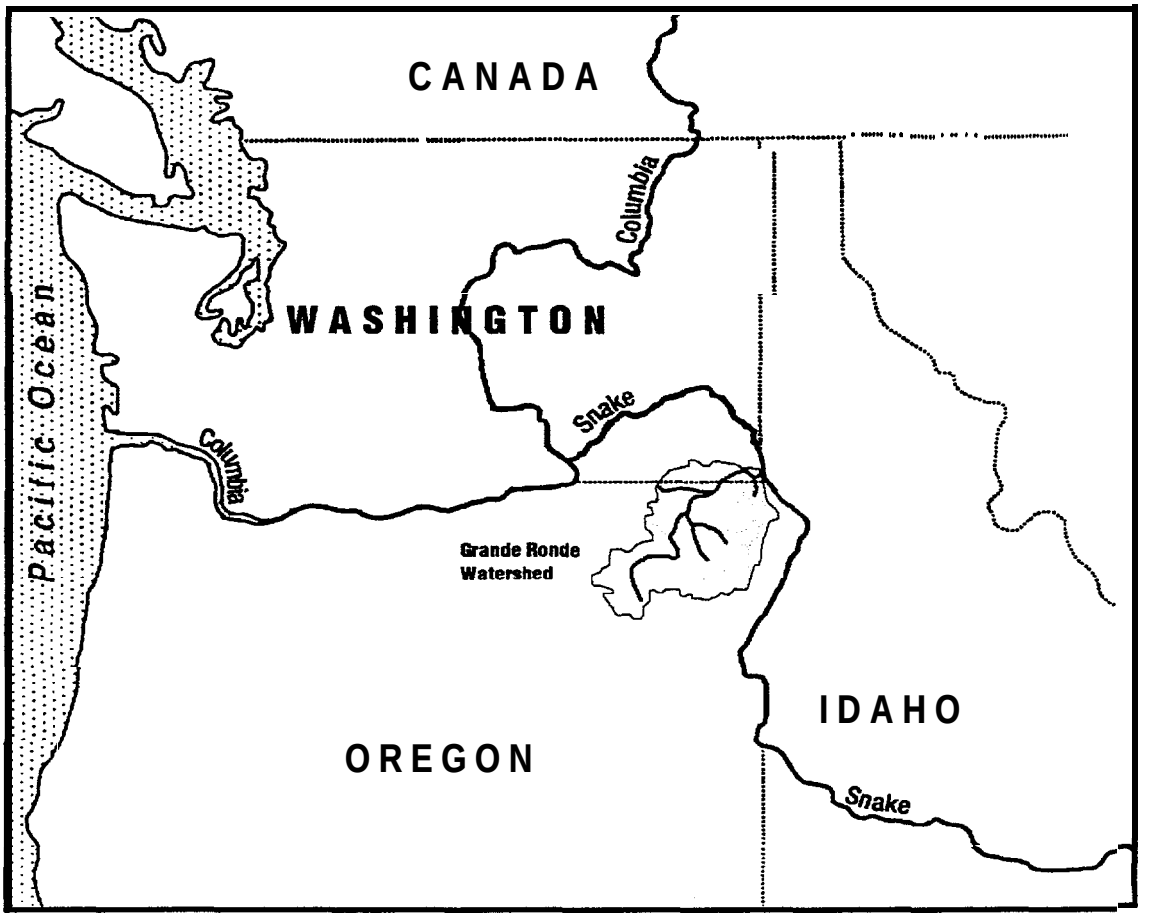


Figure 3. Map showing location of the Grande Ronde / Imnaha Basins.

The Grande Ronde Basin historically produced large runs of spring chinook salmon. Fisheries managers estimated that 12,200 spring chinook entered the river in 1957 (NPPC 1990). Run sizes were estimated to be about 8,400 fish in the early 1970s (Smith 1975). Prior to all dam construction and alteration of the watershed, run sizes were likely much larger than these levels (Lichatowich and Mobrand 1995).

Spring chinook are widely distributed in the basin. Twenty-one streams historically supported spawning. The Wenaha River, Catherine Creek, Minam River, Lookingglass Creek, Lostine River, and the Upper Grande Ronde River were considered highly productive for these fish (NPPC 1990).

Redd counts made in the basin indicate that spawner abundance remained relatively high until the early 1970s. A sharp decline has occurred since then. Run sizes in some recent years have numbered several hundred fish.

Outplanting (supplementation) of spring chinook has occurred in the basin in recent years in an attempt to bolster the run. See NPPC (1990) for a more complete description.

The suitability of chinook salmon as a diagnostic species is further supported by arguments that:

- it is sensitive to water quality and quantity, which is important to the ability of the watershed to support many other objectives,
- it is a highly migratory species and therefore utilizes most of the watershed - from mouth to headwaters,
- it has many distinct life stages and a complex history, with specific and varying environmental requirements,
- through its life history it connects the different environments and cycles nutrients between ocean and headwaters,
- and last but not least chinook salmon are an integral part of the Northwest heritage and represent an important component of its culture and quality of life.

THE EDT APPROACH – An Overview

The approach we are about to describe is referred to as the Ecosystem Diagnosis and Treatment (EDT) method (Lichatowich et al. 1995, Lestelle et al. 1996). It was devised to help diagnose the condition of resources like salmon and the environments upon which they depend. A diagnosis guides the development of rational actions and strategies. Actions may involve land use practices, water management, hatcheries or habitat restoration. The EDT method is presented in greater detail in a report titled "Applied Ecosystem Analysis – A Primer" (Lestelle et al. 1996), which we refer to in this report as the "Primer". We urge the reader who wishes a more complete description of the EDT approach to consult the "Primer".

The EDT method was developed with strong emphasis on the importance of a science-based approach. Fundamental to the scientific method is the use of an explicit conceptual framework

within which information about the natural system is gathered, analyzed and organized. A logical linkage between actions and events within the watershed and their effect on values and objectives must be presumed and explicitly addressed. This process promotes learning and provides accountability.

While the ideas we present are based on concepts that are familiar, we believe the EDT method provides a new and useful way of thinking about resources like salmon and their ecosystems.

The Ecosystem Diagnosis and Treatment (EDT) method is a science-based approach to formulating and analyzing actions to maintain or improve the sustainability and production of natural resources. Its chief aim is to provide a theory, a set of tasks, and a collection of tools which can form the basis for technical input in watershed management processes.

The approach provides an ecosystem perspective to natural resource management. The analysis focuses on one or more species, whose dependence on the ecosystem is extensive both in space and time. The approach has been developed and tested using the life histories of migratory salmonids. Their broad migratory range and sensitivity to human activities make them well suited as indicators or diagnostic species. Species other than salmon could be analyzed using the same approach.

The EDT method is formulated around five premises that support the concept of **watershed management:** 1) Management actions, whether aimed at biotic (e.g., fish populations) or abiotic (e.g., water and land) elements, should be built on an ecosystem-directed strategy; 2) A primary goal for management is to ensure the sustainability of renewable natural resources and, where possible, to allow their sustainable use; 3) Certain species or populations that are dependent on the relative stability of ecological processes over a wide expanse of the watershed can serve to help diagnose conditions for sustainability; 4) Use of the scientific method in management will increase understanding of important ecological relationships; and 5) Information generated through using the EDT method will be of most benefit if it is incorporated into an on-going and iterative management process.

The EDT method is comprised of three components: *Tasks, Theory, and Tools* These components complement each other. The *Tasks* set forth a specific sequence of actions; they explain what needs to be done and in which order. The *Theory* is the conceptual framework needed to apply the scientific method, and the *Tools* are methods, procedures and aids designed for analysis and communication. Each component is described briefly below.

The Tasks are composed of a sequence of planning and implementation steps introduced in Lichatowich et al. (1995). The sequence forms an iterative cycle of planning, implementing, and learning: 1) Identification of objectives; 2) Diagnosis; 3) Formulation of strategies and actions; 4) Trade-off analysis; 5) Revision of objectives; and 6) Prioritization and sequencing and implementation of actions, including monitoring and evaluation. Several of these steps require policy direction—we confine our discussion to the technical elements of the process.

The Theory is the conceptual framework that gives the tasks purpose and meaning. Watershed management has a logical requirement—we must be able to see the whole and its parts in a

consistent way. This requires conceptualizing the system in a manner that is useful and consistent with ecological theory. We call this conceptualization a framework or a theory. The architecture of the framework is prevailing ecological theory, and its building blocks are the assumptions which explain our observations and rationalize our actions. The EDT method incorporates an explicit conceptual framework for understanding how actions will affect the ecosystem. The EDT framework partitions the relationship between goals and actions into three components: (1) it relates goals to biological performance, (2) biological performance to environmental attributes, and (3) environmental attributes to actions.

The Tools are analytical procedures or conceptual devices used in performing analyses. There are four categories of tools: 1) diagnostic procedures and models; 2) procedures for strategy development; 3) procedures for trade-off analysis; and 4) monitoring and evaluation procedures. These tools include procedures for capturing data (a database system), for analyzing information (models and analytical routines), for displaying results (graphics and reports), and for prioritizing monitoring and evaluation.

DATA AND ANALYSIS

The data and information that is analyzed and presented in this report were obtained through a series of workshops conducted in La Grande and Enterprise over the past three years. The methods used to organize, analyze and display the data are described in detail in the Primer (Lestelle et al. 1996). We also refer to that report for a discussion of assumptions associated with the approach.

The workshops focused primarily on the second component of the framework – the relationship between biological performance and environmental attributes (see previous section). This relationship was examined for each stream reach from the perspective of seven chinook salmon life stages. Both the present and the historic (prior to Euro-American influences) conditions were evaluated as a part of a Patient-Template Analysis (PTA) (Lichatowich et al. 1995). The PTA formed the basis for the “diagnosis” of the watershed.

Part III of this document presents the results of our analysis of the Grande Ronde watershed from the perspective of chinook salmon.

PRIORITIZATION PRINCIPLES

The diagnosis tells us why resource objectives are not being met under current environmental conditions. We can now describe lost productivity and capacity in terms of location, time and life stage, and we can identify and describe the loss of life history diversity. Given the diagnosis and the stated objectives, there still remains the question of which are the most important problems to address, what are the appropriate remedies and in what order should they be applied?

The PTA and the diagnosis tell us the condition of the environment from the salmon's point of view. In particular it tells us the past and present conditions along a suite of potential life history pathways. It does not tell us which of the lost or damaged life history pathways are most important to rebuild or how to identify and prioritize potential remedial actions. This is done as a part of the "treatment selection" step in the EDT process.

The treatment selection must be consistent not only with the diagnosis of the environment but also with the present status of the chinook populations in the Grande Ronde and Imnaha basins. It also needs to be consistent with the mechanisms whereby chinook populations organize themselves within a changing environment. Those mechanisms include metapopulation organization and genetic diversity (ISG 1996). Analysis of the metapopulation structure of the historic Grande Ronde and Imnaha chinook populations was not attempted in this project (although the PTA analysis does shed light on this subject). Instead the assumption was made that the maintenance and enhancement of existing populations of spring chinook would be a high priority in the process of identifying and restoring core populations and their habitats.

Several hundred potential life history pathways for spring chinook within the study area were identified. Based upon present usage they were classified as primary, secondary, or vacant (perhaps the ghosts of pathways lost). Then the following strategic priorities were recommended:

1. Maintain the quality of habitat associated with primary life history pathways.
2. Improve the quality of habitat associated with primary life history pathways.
3. Maintain the quality of habitat associated with secondary life history pathways.
4. Improve the quality of habitat associated with secondary life history pathways.
5. Begin to improve habitat quality along lost life history pathways – with highest priority for potential core population pathways.
6. Reconnect the lost (and thus vacant) life history pathways to begin their repopulation.

In order to translate these strategic priorities into reach specific action priorities, we need to know (a) which reaches are most important for spring chinook, and (b) among those, which ones offer opportunities for improvement, To address question (a) we computed a **"chinook usage score"** for each reach based on the numbers of primary and secondary life histories it supported. Since all priority one life history pathways cannot be improved simultaneously, we need to further refine these strategic priorities. We suggest that the potential for biological performance improvement is an appropriate and useful criterion for such refinement. By biological performance we mean the combination of productivity, capacity and diversity. We argue that, under present conditions, productivity is perhaps the most important element of performance. The potential for improvement also depends upon the feasibility to enhance productivity -- question (b) above. If we assume that historic performance represents an upper limit to future performance, then the difference between the present and the past is a measure of potential gain. In order to identify the priority of a specific stream reach we must take into consideration the potential cumulative gain in performance (primarily productivity) in that reach, which depends on how much time the fish spend there. These considerations were assimilated into a score for **"habitat productivity change."**

Part III of this report includes tables and charts that enable decision makers to translate these strategic priorities into reach specific action priorities by referring to chinook usage scores, habitat productivity change scores, and other information.

PART III: RESULTS AND DISCUSSION

This part of the report introduces the results of the EDT analyses performed to date. There are three subsections covering respectively: patient-template analysis (PTA), diagnosis, and treatment selection. The actual study results are contained in the Appendices at the end of the report. This section is a road map to the lookup charts and tables in the Appendices.

PATIENT-TEMPLATE ANALYSIS

Purpose and Terminology

The Patient-Template Analysis (PTA) is an examination of watershed conditions from the perspective of spring chinook salmon, the diagnostic species. The PTA compares existing environmental conditions (the Patient) to historic reference conditions (the Template). The Template is a reference point that represents the spring chinook performance potential within the climatic, geologic, and biologic setting of the watershed.

Both the PTA and the subsequent diagnosis (next section) use the term "performance" to describe watershed conditions. Performance consists of three elements that together measure the suitability of the watershed to support spring chinook salmon. These elements are productivity', capacity', and diversity.' Roughly speaking, these terms represent the quality, the quantity, and the distribution and connectivity of conditions for spring chinook within the watershed.

Results of the analysis are presented as a series of charts and summary narratives. The narratives highlight the major differences between Template and Patient conditions seen in each chart. This information which is grouped by "stream reach ranges" (see definition below), is provided in Appendix C for both the Grande Ronde and Imnaha basins.

Description of PTA Graphics

The graphics are designed to facilitate comparison between Patient and Template. Each display is a visualization of spring chinook performance patterns over space and time within the watershed.

Two types of graphic layouts are used. The first displays either the quantity of key habitat -- a measure of habitat capacity (Fig. 4), or relative density-independent survival --a measure of productivity (Fig. 5). These graphics depict each of the two performance-related measures as a "landscape" across a grid that defines location and time. The landscapes are shown as three-dimensional surfaces projected above a contour plot on the space-time plane.

1/ Productivity is the reproductive rate of a salmon life cycle: it can be disaggregated into a density-independent survival rate and reproductive potential (e.g., the salmon's fecundity) components. The survival component can be further disaggregated into life stage survivals. The cumulative value for an entire life history is referred to as cumulative productivity. The analysis presented here focuses on the survival component, which is affected by environmental quality.

2 / Capacity represents the upper limit on abundance that a given unit of habitat can support within some time period. Within a short period of time, it is largely determined by the quantity of habitat available (with a given quantity of food). Over longer periods of time, such as covering the full period of freshwater utilization by spring chinook, there is a cumulative capacity for production, which is affected by productivities and capacities at intermediate life stages. Capacity regulates the density-dependent survival component of total survival.

3/ Life history diversity represents the range of pathways through space and time available to, and used by, a species in completing its life cycle.

Catherine Cr Key Habitat Quantity

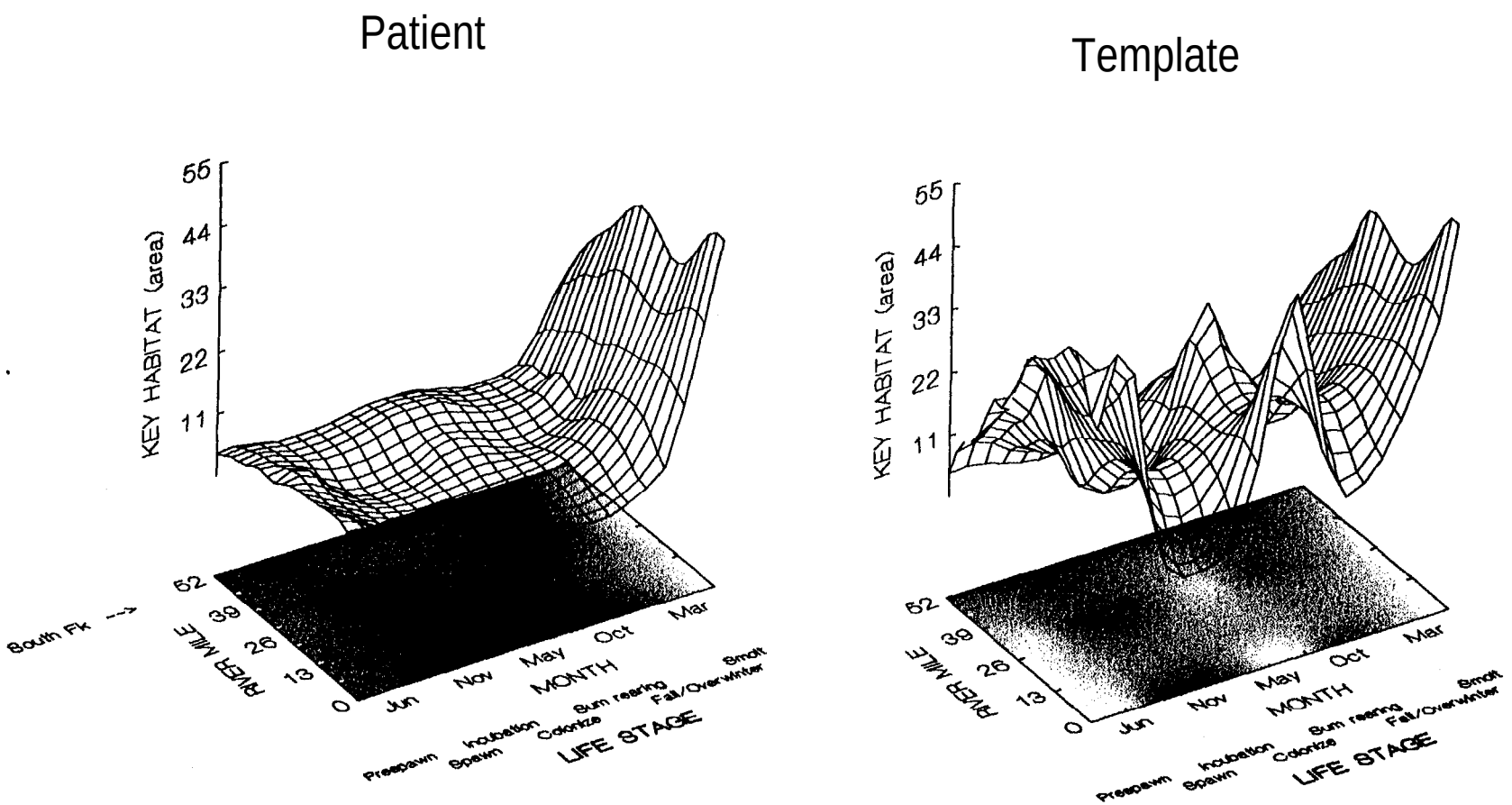


Figure 4. **Sample key habitat landscape for a tributary (Catherine Cr.)**

Catherine Cr Relative Survival

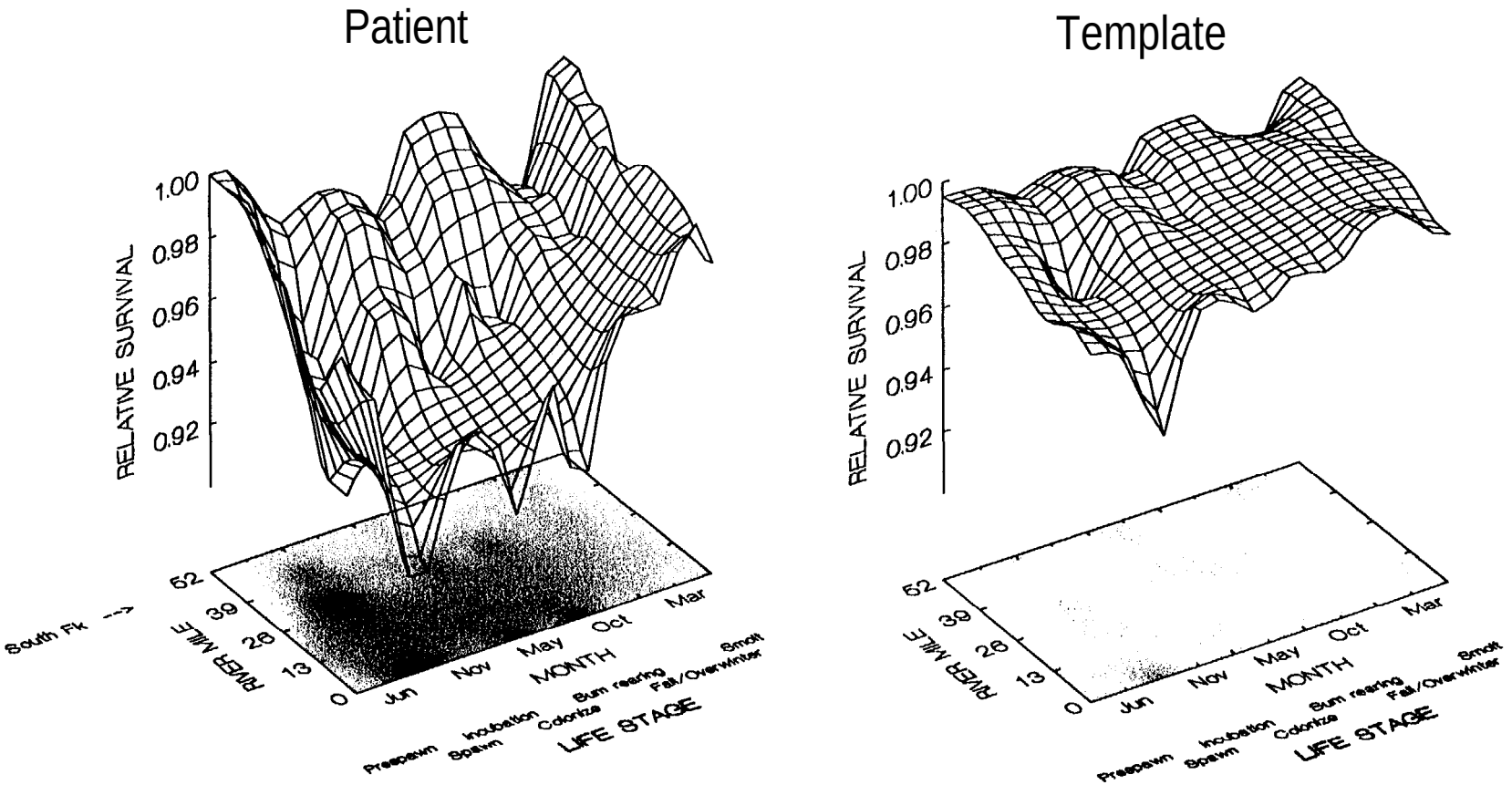


Figure 5. Sample productivity landscape for a tributary (Catherine Cr.)

The space dimension of each graphic is shown as location (river mile) along a continuously connected stream channel, from its headwaters to its mouth. The time dimension is measured in months. Corresponding to time are the life stages (Table 1) of spring chinook salmon, shown on each chart to identify the approximate time period associated with each life stage.

The two measures (key habitat and relative survival) illustrated in these graphics are indirect measures of life stage capacity and life stage productivity. Key habitat is the portion of the total quantity of habitat available that is strongly preferred or required for a given life stage (Table 2); Fig. 4 depicts quantity as the amount of stream surface area within a defined stream reach comprising key habitat. Relative survival (Fig, 5) is an index of productivity, where a value of 1 indicates that survival conditions at a given location and time are optimal; values less than 1 indicate less than optimal conditions.

The second type of graphic is composed of 28 separate charts (Fig. 6), each with the same space and time dimensions that are used in the first type of graphic. The charts compare broad patterns of environmental quality for Patient and Template for each of 14 attributes that affect survival (Table 3), all displayed on one page to facilitate comparison. The display for each attribute is a 2-D contour plot showing the effects of the attribute on productivity (i.e., relative survival, as illustrated in Fig. 5). These graphics are meant to show only broad patterns of attribute effects, highlighting differences between stream reaches and life stages-they do not show differences in effects within life stages at a particular location.

Stream Reach Ranges

The landscapes displayed in Figs. 4-6 use Catherine Creek as an example. Location (river miles) is displayed as distance from the mouth of Catherine Creek. Another way of viewing Catherine Creek is as an extension of the Grande Ronde River. Here location is shown along the river channel beginning at the Grande Ronde River's entry into the Snake River, extending upstream to the mouth of Catherine Creek, then continuing upstream the length of Catherine Creek (for example, Figs. 7-9). Hence location (distance in river miles from the Snake River) can always be viewed along a single, linear dimension in relation to the Snake River. The connected stream reaches that form the y-axis on the chart are referred to as a stream **reach range.**

A reach range begins at the main river's entry into the Snake River and terminates at or near the headwaters of a contiguous drainage. The locations where one stream enters the next larger channel are denoted along the reach range in the larger charts. Each reach range ends at or near the upstream margin of the habitat utilized by spring chinook in the drainage.

By displaying environmental information along the major reach ranges used by spring chinook salmon in a watershed, a series of landscapes can be presented that show the portions of the watershed that are most important, relevant to different spawning subpopulations.

Table 1. Definition of spring chinook salmon life stages within the Grande Ronde Basin and corresponding time periods.

Life Stage	Description	Months	Statistical weeks
Pre-spawning adult	Upstream adult migration and holding prior to spawning.	April-August	15-33
Spawning	Spawning period, including establishment and defense of redd sites.	August-September	33-38
Incubation	Egg deposition to fry emergence.	August-April	33-70
Fry colonization	Fry emergence until establishment of summer rearing locations.	April-June	61-71
Summer rearing	After colonization ceases when fish are largely stationary and activities are mainly directed at feeding and growth (large fish may outmigrate near end of period).	June-September	71-95
Fall redistribution and overwintering	Beginning with drop in temperature in early fall until the onset of yearling smolt migration at the end of winter.	September-March	96-114
Smolt to smolt	Onset of seaward migration to departure from the Grande Ronde Basin.	April-June	114-125

Table 2. Descriptions of key habitat used by spring chinook salmon by life stage within the Grande Ronde Basin.

Life stage	Key habitat
Pre-spawning adult	Large, deep pools with sufficient connecting flow for adult migration.
Spawning	Riffles containing a mixture of gravel and cobble sizes with flow of sufficient depth for spawning activity.
Incubation	Riffles as described for spawning with sufficient flow for egg and alevin development.
Fry colonization	Shallow and relatively slow velocity areas within stream channel, often associated with stream margins and in relatively low gradient reaches.
Summer rearing	Pool type habitat associated with relatively low gradient stream channel reaches (usually not in backwaters nor slow eddies).
Fall redistribution/overwintering	Areas containing structural complexity (wood matrices, brush, or large cobbles) within flowing channel, not usually in swift or higher gradient reaches; off-channel areas (ponds, oxbows, etc.).
Smolt to smolt	Sufficient flow for free movement of smolts downstream.

Table 3. Description of environmental quality attributes affecting responses of salmonids within freshwater. This list was applied to spring chinook salmon in the Grande Ronde Basin; other attributes may be needed for other species or in different types of environments.

Attribute	Description
Channel stability	Stability of the reach with respect to its streambed, banks, and its channel shape and location.
Flow	Pattern and extent of flow fluctuations within the stream reach.
Habitat type diversity	The extent of habitat complexity within a stream reach. Complexity is the opposite of uniformity; greater complexity increases density-independent survival; woody debris, brush, and other structure add complexity.
Sediment load	The amount of sediment present in, or passing through, the stream reach. Sediment may be suspended (turbidity), moving along the substrate (bedload), or within the substrate (percent fine particles).
Temperature	Water temperature in the stream reach. Density-independent survival is affected by rapid fluctuations, or by conditions near the extremes of tolerance.
Riparian condition	The state of the vegetation component of the narrow strip of land bordering the stream where vegetation species occur that are dependent on the stream or its adjacent water table.
Predators	The relative abundance of predators that feed upon the diagnostic species. The effects of poaching and human harassment are included here.”
Chemicals	Concentrations of toxic chemicals from point and non-point sources.
Competitors	The relative abundance of other species in the stream reach that compete with the diagnostic species for food or space.
Obstructions	Physical structures that impede the use of a stream reach, such as dams, weirs, or waterfalls.
Withdrawals	Water withdrawals from the stream reach.
Nutrient load	The concentration of dissolved nutrients due to natural or man-induced causes. (Only nutrient loads that affect density-independent survival are considered here; hence, food enrichment for the diagnostic species is not addressed here.)
Oxygen	Mean concentration of dissolved oxygen in the stream reach.
Pathogens	The abundance, concentration, or effect of pathogens in the stream reach. For example, the presence of a fish hatchery or large numbers of livestock along the reach could cause unusually high concentrations of pathogens.
Other	Any other attribute unique to the stream reach that may affect survival.

‘Subsistence, ceremonial, recreational and commercial fishing impacts are not included.

Catherine Cr Environmental Attributes

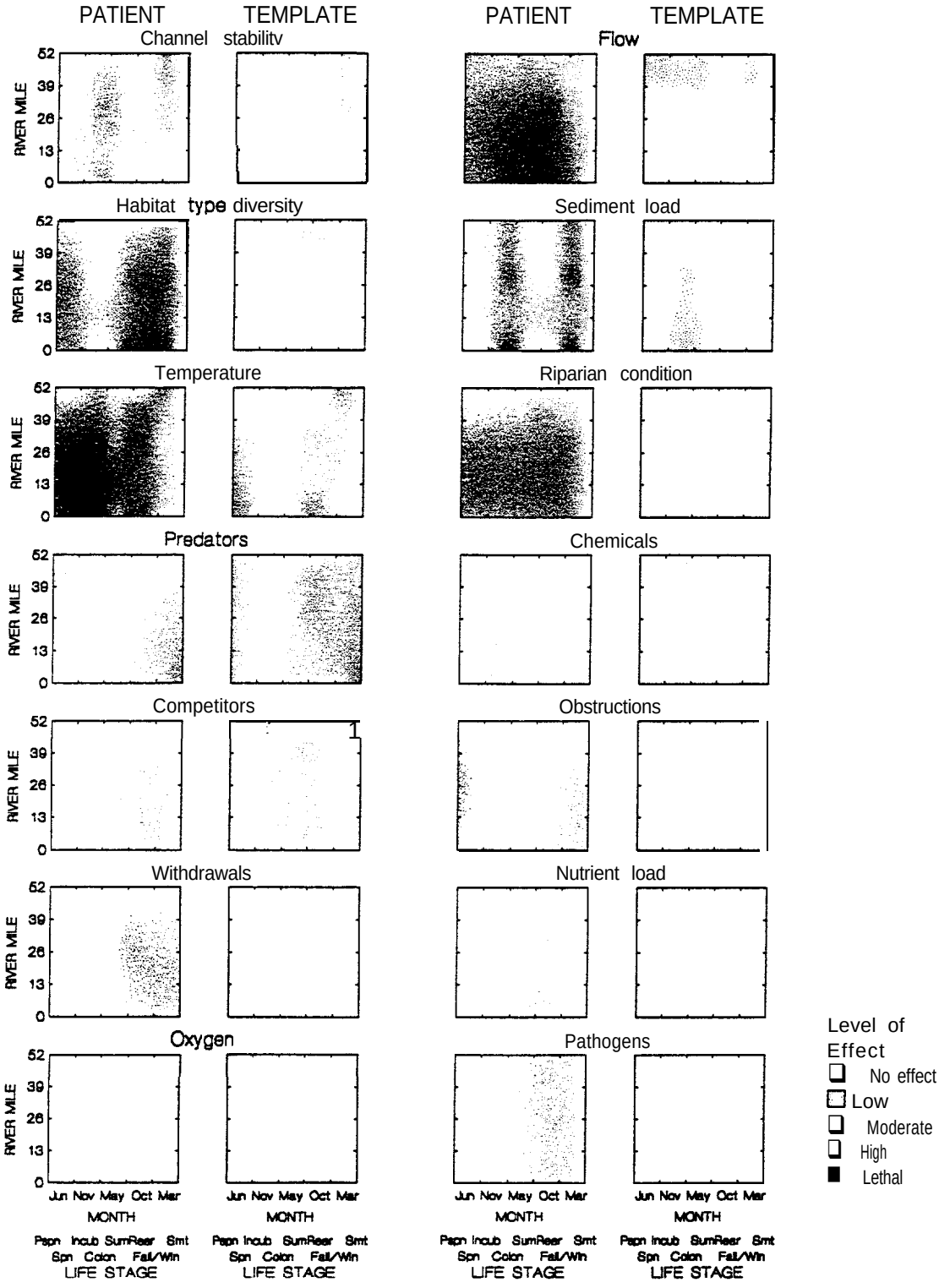


Figure 6. Sample environmental attribute landscapes for a tributary (Catherine Cr.)

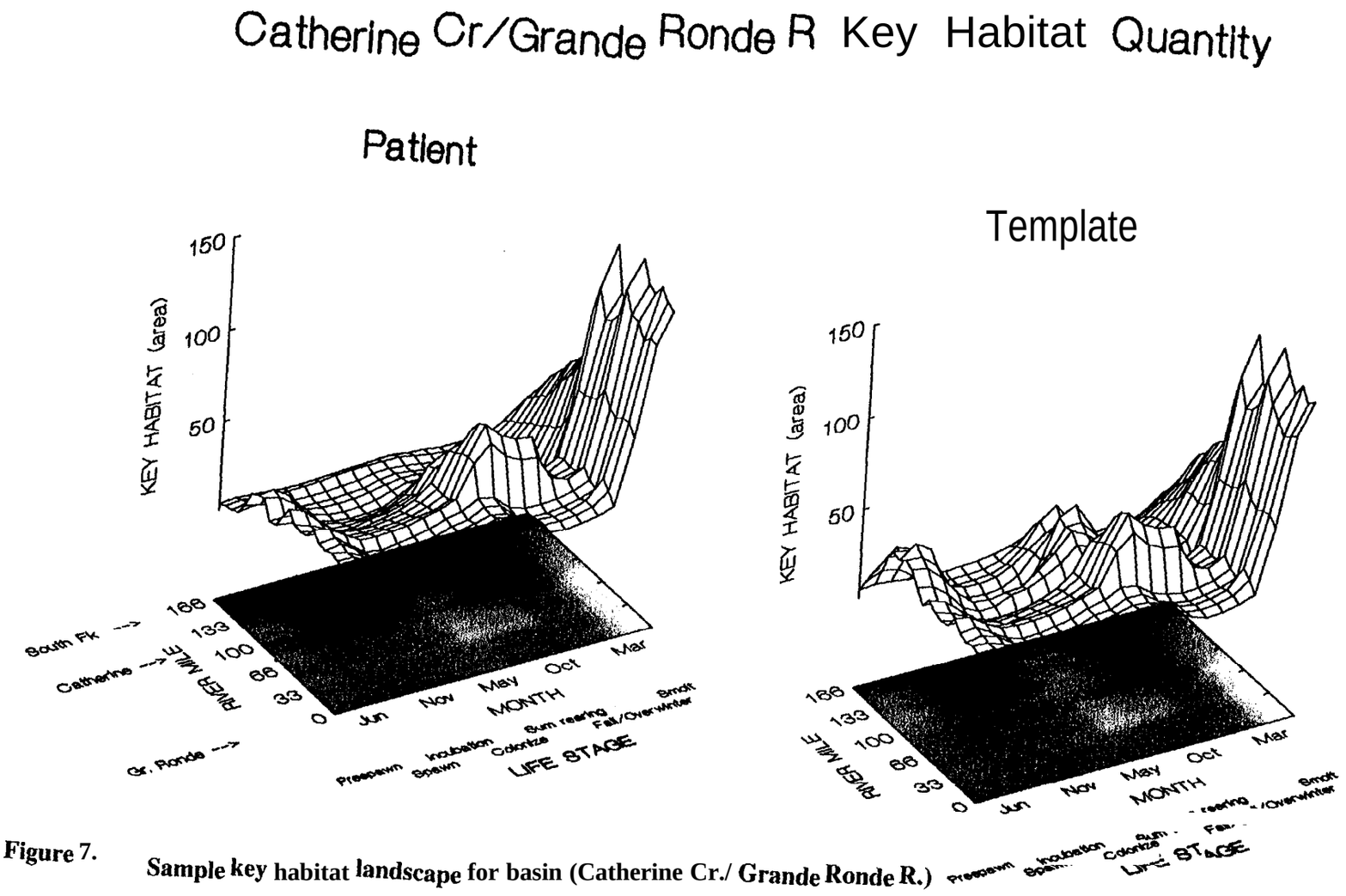


Figure 7. Sample key habitat landscape for basin (Catherine Cr./ Grande Ronde R.)

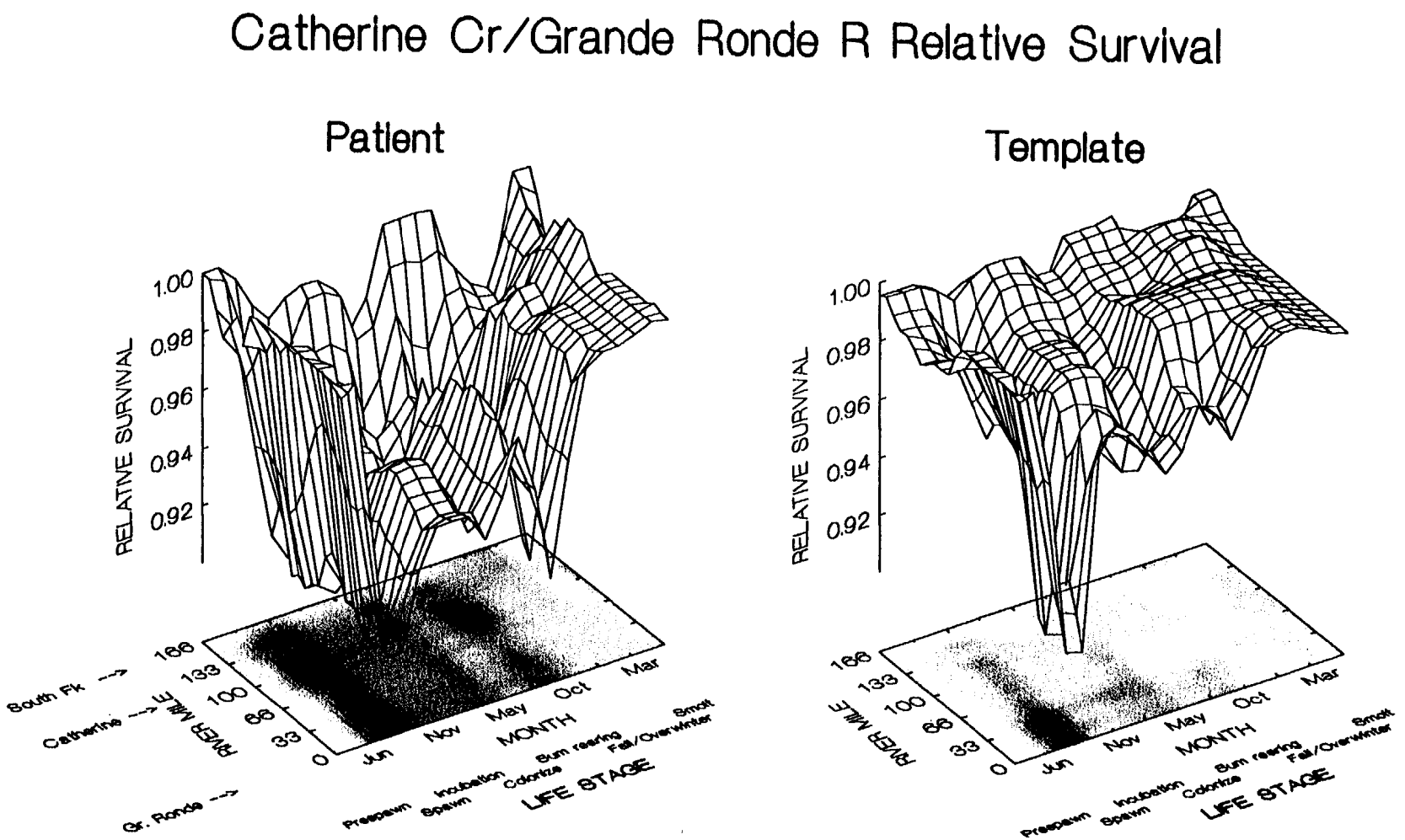


Figure 8. **Sample productivity landscape for basin (Catherine Cr./ Grande Ronde R.)**

Catherine Cr/Grande Ronde R Environmental Attributes

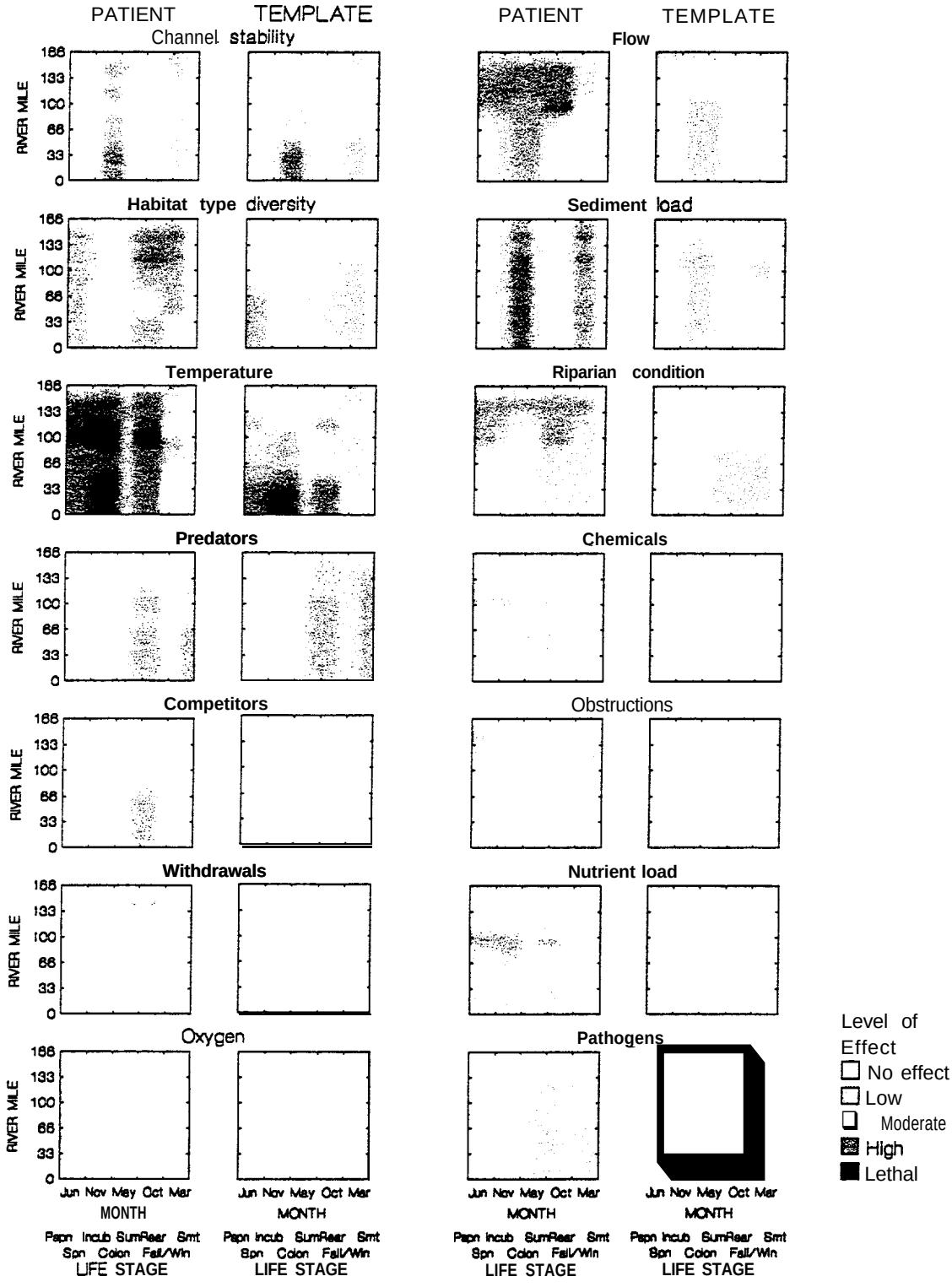


Figure 9. **Sample environmental attribute landscape for basin (Catherine Cr./ Grande Ronde R.)**

Where applicable, a set of six landscape graphics are presented together, as in Figs. 4-9. Figs. 7-9 show the Catherine Creek/Grande Ronde River reach range, whereas Figs. 4-6 show a close-up view of just Catherine Creek for greater resolution within this smaller drainage.

A list of stream reach ranges used in the analysis is given in Table 4.

Table 4. List of reach ranges used in the analysis.

Grande Ronde Basin	Bear Cr. / Wallowa R. / Grande Ronde R.
	Catherine Cr. / Grande Ronde R. [1]
	Chesnimnus Cr / Joseph Cr. / Grande Ronde R.
	Grande Ronde R.
	Hurricane Cr. / Wallowa R. / Grande Ronde R.
	Lookingglass Cr. / Grande Ronde R.
	Lostine R. / Wallowa R. / Grande Ronde R.
	Minam R. / Wallowa R. / Grande Ronde R.
	OK Gulch Cr. / Prairie Cr. / Grande Ronde R.
	Sheep Cr./ Grande Ronde R.
	Wallowa R. / Grande Ronde R.
	Wenaha R. / Grande Ronde R. [1]
Imnaha Basin	Big Sheep Cr. / Imnaha R.
	Imnaha R.
	Lightning Cr. / Imnaha R.
	Little Sheep Cr. / Big Sheep Cr. / Imnaha R

[1] This reach range include the South Fork: a reach range with the North Fork would produce comparable results.

Example of PTA Summary

A narrative interpretation of the PTA, for the Catherine Creek/Grande Ronde River reach range is shown below as an example.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Catherine Creek is greatly reduced compared to historic levels (Fig.4). These losses are due to land development, channel straightening and realignment, removal of large organic structure from the channel, and dewatering of the channel. Loss of key habitat has occurred for nearly every life stage, but it has been particularly severe for the prespawning, fry colonization, summer rearing, and overwintering life stages.

The quantity of key habitat within the Grande Ronde River downstream of Catherine Creek is substantially reduced compared to historic levels for a distance of approximately 30 miles (Fig. 5). These losses have been greatest for the spawning, egg incubation, fry colonization, and overwintering life stages. Further downstream, loss in key habitat has been comparatively minor.

Relative Productivity (Survival)

The capability of Catherine Creek of supporting spring chinook productivity (survival) is sharply reduced compared to historic conditions for nearly every life stage (Fig. 6). This reduction has been most severe in the lower 40 miles of stream, with conditions improving in the upper stream reaches. Survival conditions approach historic levels for some life stages in the Catherine Creek forks. Survival conditions are especially low in the later phase of the prespawning stage and in the spawning, incubation, fry colonization, and summer rearing stages in the lower 30 miles of stream. Survival conditions have declined in these reaches due primarily to increased water temperature, increased sediment load, loss in habitat diversity, loss in flow, channel and bank destabilization, and alteration of the riparian corridor (Fig. 7).

The capability of the Grande Ronde River for approximately 70 miles downstream of Catherine Creek for supporting spring chinook productivity is sharply reduced compared to historic conditions for many life stages (Fig. 9). This loss has been most severe for a distance of approximately 40 miles downstream of Catherine Creek. Survival conditions in these reaches are especially poor in the prespawning, spawning, incubation, and summer rearing life stages. Survival conditions have declined in these reaches due primarily to increased water temperature during mid to late summer, increased sediment load, alteration of runoff patterns, and channel destabilization (Fig. 8).

Results

Graphic results and narrative interpretations of the Patient-Template Analysis are presented for all reach ranges in Appendix C.

DIAGNOSIS

Purpose

The diagnosis is a determination of the potential of the Grande Ronde and Imnaha watersheds to support persistence, abundance, and distribution goals for spring chinook salmon. It is performed by analyzing the information assembled in the PTA from a spring chinook life history perspective with these restoration goals in mind. The diagnosis synthesizes the information to guide the formulation and prioritization of actions that are consistent with watershed goals and that effectively target the impediments to spring chinook performance.

Overview of Diagnostic Steps

A major conclusion of the PTA for both the Grande Ronde and Imnaha basins is that environmental conditions affecting salmon survival differ greatly over time and space within these watersheds. Salmon performance can, therefore, vary dramatically, depending on how members of a salmon population utilize the river system by location and time of year. The diagnosis is designed to test the performance characteristics of the watershed along a large and diverse series of pathways that represent the range of possible life history patterns of spring chinook. A life history pathway, or trajectory, is the specific route that a single salmon and its offspring, might follow through a river system.

The diagnosis is made through four steps: 1) identify representative life history pathways (trajectories) which will serve as "probes" of the performance landscapes; 2) compute numerical indices of performance for each life history pathway and graph the separate performance measures along each pathway for both Patient and Template; 3) review the performance graphs to assess the changes in salmon performance potential of the reach range; and 4) summarize findings into a short narrative.

Step 1: Definition of Life History Pathways

A life history pathway begins at the point (time and location) where a maturing adult enters the river system, continues upstream to the point of reproduction, then proceeds through the locations where juvenile rearing and downstream migration occur. The pathway is a trajectory through time and space -- it serves as a "probe" of the environmental conditions a salmon might encounter within the watershed. Many such probes are needed to obtain a useful picture of the salmon performance potential of the entire watershed.

Life history **pathways** can be defined consistent with several general life history **patterns** that spring chinook salmon exhibit. We define a life history **pathway** as a unique route through a river system. A **pattern,** on the other hand, refers to a more general way in which salmon move through and use the system – it is a collection of pathways. In one pattern, for example, emergent fry take up residence within their natal stream reach and remain there until smolt migration one year later. In another pattern, emergent fry take up residence in their natal reach and remain there

until fall, when they move downstream to overwintering habitat. In the latter case, the over-wintering site may be several miles downstream or scores of miles, but in either case, the general pattern is to redistribute downstream in the late summer/early fall. A large watershed, therefore, contains a myriad of possible pathways but comparatively few life history patterns. For purposes of this analysis, we identify five distinct life history patterns (Table 5).

Associated with each potential spawning stream, a **reach range** (as defined above) was identified. For each reach range nine different life history pathways were defined by -- one or more for each of the five life history patterns. The nine distinct pathways were defined by systematically varying spawning location (within the reach range) and migration timing consistent with the given life history pattern

The nine pathways associated with a spawning reach are best explained with an example (Fig. 10). The spawning reach of the South Fork of Catherine Creek is located approximately 165 miles upstream of the mouth of the Grande Ronde River. Each of the nine charts in Fig. 10 traces a pathway in space and time along the Catherine Cr./Grande Ronde reach range. One pathway (# 1) represents life history pattern 1 in Table 5. Three pathways (#'s 2, 3, and 4) represent pattern 2, each differing in the distance to the overwintering site. One pathway (# 5) represents pattern 3. Three pathways (#'s 6, 7, and 8) represent pattern 4, each differing in the distance to the over-wintering site. The last pathway (# 9) represents pattern 5 -- fish migrating to the Snake River as subyearlings in late summer.

All life history patterns were defined so that they enter the Grande Ronde (Imnaha) River between mid April and mid May as maturing adults. Patterns l-8 leave the Grande Ronde (Imnaha) in May as smolts. Pattern 9 was defined to leave the Grande Ronde (Imnaha) River as subyearlings in October.

The analyses in this report by necessity assume that survival outside the Grande Ronde and Imnaha subbasins is the same for all life history pathways, even though observations suggest that this assumption probably is false. Studies have indicated that arrival times at Lower Granite of different life history patterns are not the same (Keefe et al. 1996) and consequently different survival conditions in the mainstem Snake and Columbia Rivers are most likely encountered. Our study is limited to the reaches within the subbasins and hence cannot account for the potentially important implications of diversity of life history pathways in the remainder of the life cycle.

A total of 71 and 28 spawning reaches are used to define unique pathways in the Grande Ronde and Imnaha basins respectively. Combined, a total of 88 1 pathways are used in analyzing salmon performance in the two basins. This large, diverse set of pathways enable us to systematically probe potential salmon performance over the entire watershed.

Table 5. Five generalized life history patterns of spring chinook salmon in the Grande Ronde and Imnaha basins used in the diagnostic analysis. Note: This is not intended to be a complete list of all patterns within these river basins.

Pattern	Adult entry timing	Spawning timing	Emergent fry colonization	Summer rearing	Overwintering	Emigration to Snake River
1	April - mid June	August - September	Residency established near natal site	Remain in same vicinity where fry colonization occurs	Remain in same vicinity as summer residents	April - May as yearlings
2	April - mid June	August - September	Residency established near natal site	Remain in same vicinity where fry colonization occurs	Movement occurs in late summer/early fall downstream to suitable hahilat	April - May as yearlings
3	April - mid June	August - September	Dispersal downstream to suitable hahitat	Remain in same vicinity where fry colonization occurs	Remain in same vicinity as summer residents	April - May as yearlings
4	April - mid June	August - September	Dispersal downstream to suitable habitat	Remain in same vicinity where fry colonization occurs	Movement occurs in late summer/early fall downstream to suitable habitat	April - May as yearlings
5	April - mid June	August - September	Dispersal downstream IO suitable hahitat	Remain in same vicinity where fry colonization occurs	Overwintering does not occur within the basin	September - October as subyearlings

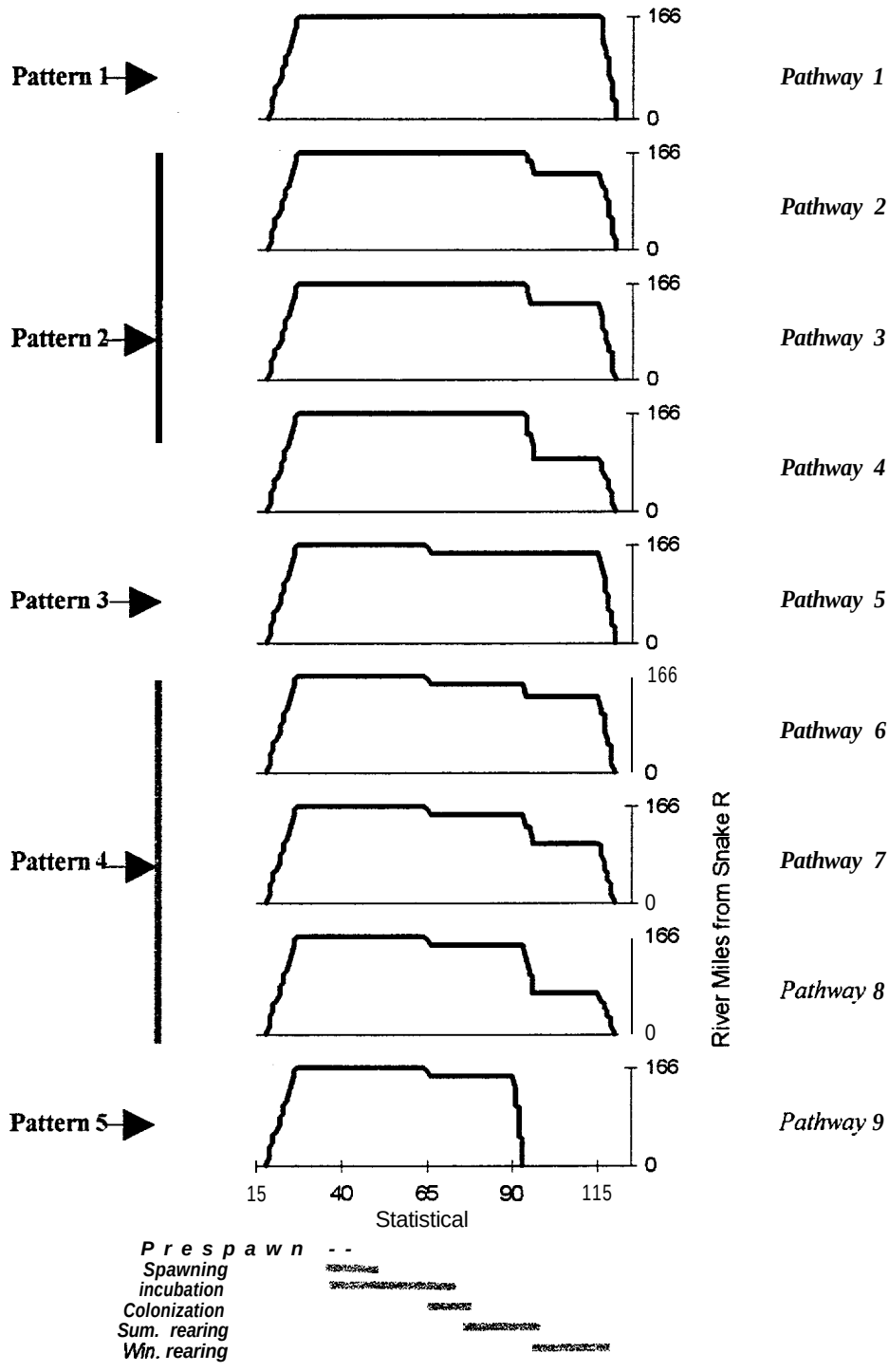


Figure 10 Sample graphic showing nine typical life history pathways used in the diagnosis (spawning reach in this example is the South Fork of Catherine Cr).

Step 2: Computation of Salmon Performance Indices

To understand the relative importance of various stream reaches to spring chinook salmon, performance needs to be analyzed in a way that synthesizes all conditions of all reaches encountered by individual salmon pathways. This is done by computing numerical indices of what we call cumulative productivity and cumulative capacity for each life history pathway (see EDT Primer, Lestelle et al. 1996, for details). These indices reflect the cumulative effects of all environmental conditions on a group of fish that would utilize the watershed along a specific pathway.

The cumulative productivity index compares the capability of pathways to sustain spring chinook salmon. As a rough guide, populations that must rely on pathways with index values less than about 150 could be considered at extreme risk given the survival conditions outside of the Grande Ronde and Imnaha basins. We also suggest that populations relying on pathways with values less than 300 be considered at high risk.

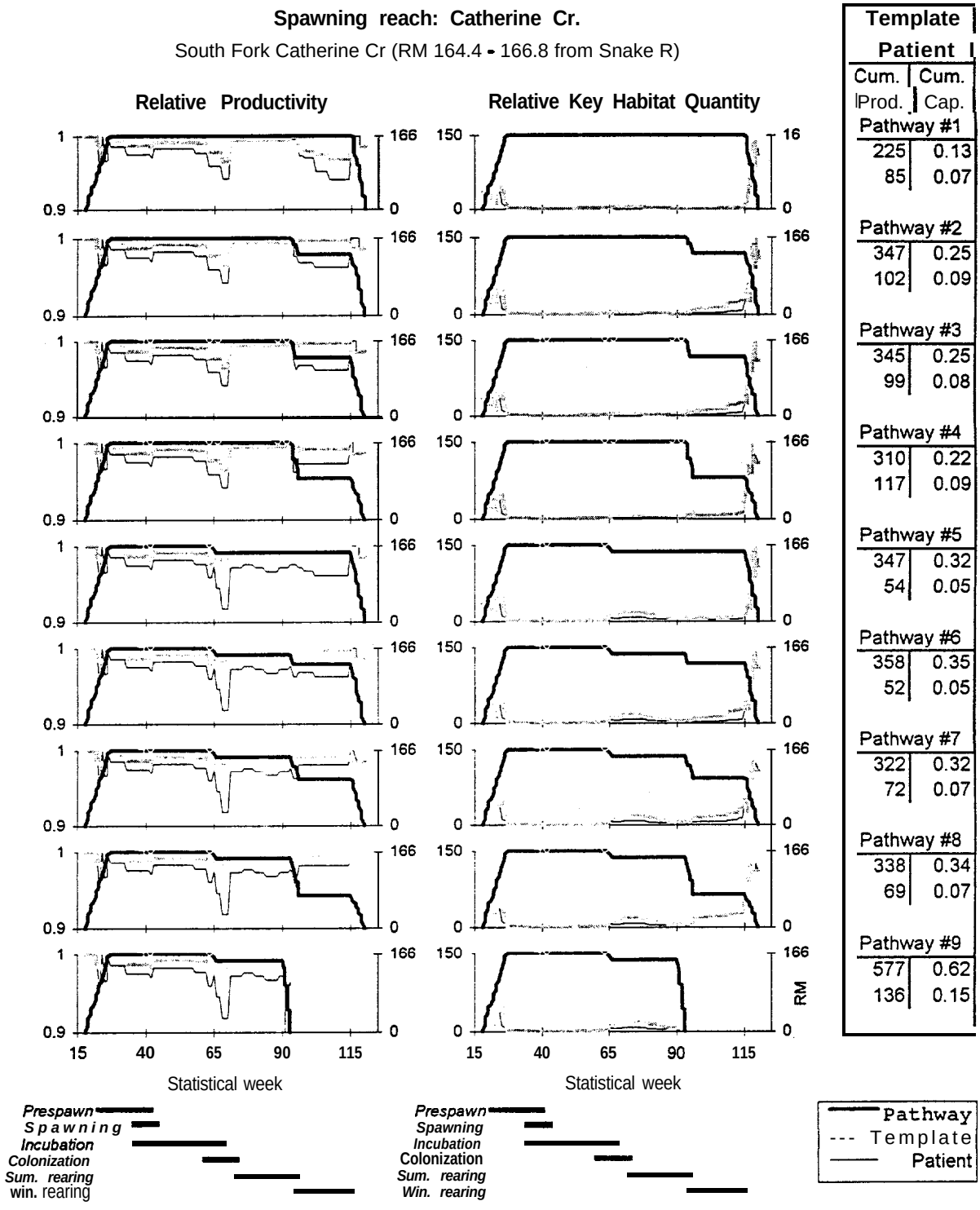
The cumulative capacity index reflects the maximum abundance of spring chinook salmon (computed as smolt equivalents) that could be produced along the different pathways, if spawning reaches were fully utilized.

Performance index values for all life history pathways analyzed are listed in Appendices A and B for the Grande Ronde and Imnaha basins respectively. Also given are profiles of productivity and quantity of key habitat associated with each pathway. Results are grouped by spawning reach; each page provides results for the nine pathways associated with the reach range defined by the given spawning reach.

An example is given in Fig. 11 to explain the graphics in Appendices A and B using the South Fork Catherine Creek spawning reach. The figure is composed of 18 individual profile charts, nine for relative survival (productivity) and nine for quantity of key habitat quantity. Each chart compares Patient and Template values of either relative survival or key habitat; also shown on each chart for reference is the pathway (trajectory). These profiles show values corresponding to the route that would be followed by specific pathways traced across the appropriate landscape (Appendix C). The profiles identify the specific places and times where productivity or quantity of key habitat is different between Template and Patient and the extent of change.

Step 3: Review of Performance Plots

Performance plots are pictures of how potential salmon performance has changed within the watershed. They, more comprehensively than the other graphics, illustrate the implications to salmon performance as a result of altered environmental conditions in the watershed. The plots combine the three elements of performance-productivity, capacity, and life history diversity-into one picture to facilitate diagnosis.



Template Patient	
Cum. Prod.	Cum. Cap.
Pathway #1	
225	0.13
85	0.07
Pathway #2	
347	0.25
102	0.09
Pathway #3	
345	0.25
99	0.08
Pathway #4	
310	0.22
117	0.09
Pathway #5	
347	0.32
54	0.05
Pathway #6	
358	0.35
52	0.05
Pathway #7	
322	0.32
72	0.07
Pathway #8	
338	0.34
69	0.07
Pathway #9	
577	0.62
136	0.15

Figure 11. Sample graphic showing productivity and capacity profiles for pathways with common spawning reach (in this esample the spawning reach is the South Fork of Catherine **Creek.**

Plots are provided at two scales for each basin. One plot compares all pathways in each basin together for both Patient and Template (Figs. 12 and 15). The same information is then shown plotted separately for the major subbasins in each basin (Figs. 13 and 16). Each plot is composed of data points for both Patient and Template, where a single data point depicts cumulative productivity and cumulative capacity for one pathway (as listed in Appendices A and B). The number of data points in the chart is an indicator of life history diversity — more abundant and productive pathways suggest greater diversity of life histories.

Accompanying the plots at the subbasin scale is another graphic that provides additional information on the potential of each subbasin for salmon production (Figs. 14 and 17). Because spawning reaches vary in length, the points in the performance plots do not necessarily represent the same number of fish. Figs. 14 and 17 attempt to correct for this by weighting the heights of the bars in the histogram by spawning reach length. Bar height in these histograms represents the relative number of potential pathways linked to spawning reaches in each subbasin when reach lengths are standardized among subbasins. The x-axes in these plots are identical to those in Figs. 13 and 16 to facilitate comparison between the graphs.

Step 4: Diagnostic Summaries

In the following, the diagnosis for each subbasin within the Grande Ronde and Imnaha basins are discussed. It is **important to note** that problems stated for life histories of a given subbasin are the result of habitat changes **both inside and outside** that subbasin. To understand the significance of changes to reaches within the subbasin we refer to Appendices D - H.

Grande Ronde Basin

The current potential of the Grande Ronde Basin to produce and sustain spring chinook salmon in relation to conditions within the basin has been severely reduced compared to historic potential (Fig. 12). The large majority of life history pathways (represented by data points in Fig. 12) that historically were capable of supporting spring chinook can no longer do so due to changes in the quality of habitat that have occurred over the past 150 years.[4]

In general, data points for the Patient in Fig. 12 show a dramatic shift to the lower left portion of the chart, indicating that fish following these life history pathways are less able to sustain themselves against additional mortality pressures than they could historically. Moreover, the capacity of these pathways for smolt abundance has declined sharply.

Life history pathways with productivity index values less than about 150 are probably at extremely high risk of extinction given the current conditions outside of the Grande Ronde basin. High risk of extinction may also exist for pathways with values as high as 300. These life history

4 / Major losses in sustainable life history pathways can be attributed to changes within the Grande Ronde (and Imnaha) watershed, however the problem is exacerbated by a reduction in survival outside the basin. It is the cumulative effect of productivity losses both within and outside the basins that has caused the severe decline in the abundance and sustainability of salmon produced from the Grande Ronde and Imnaha basins.

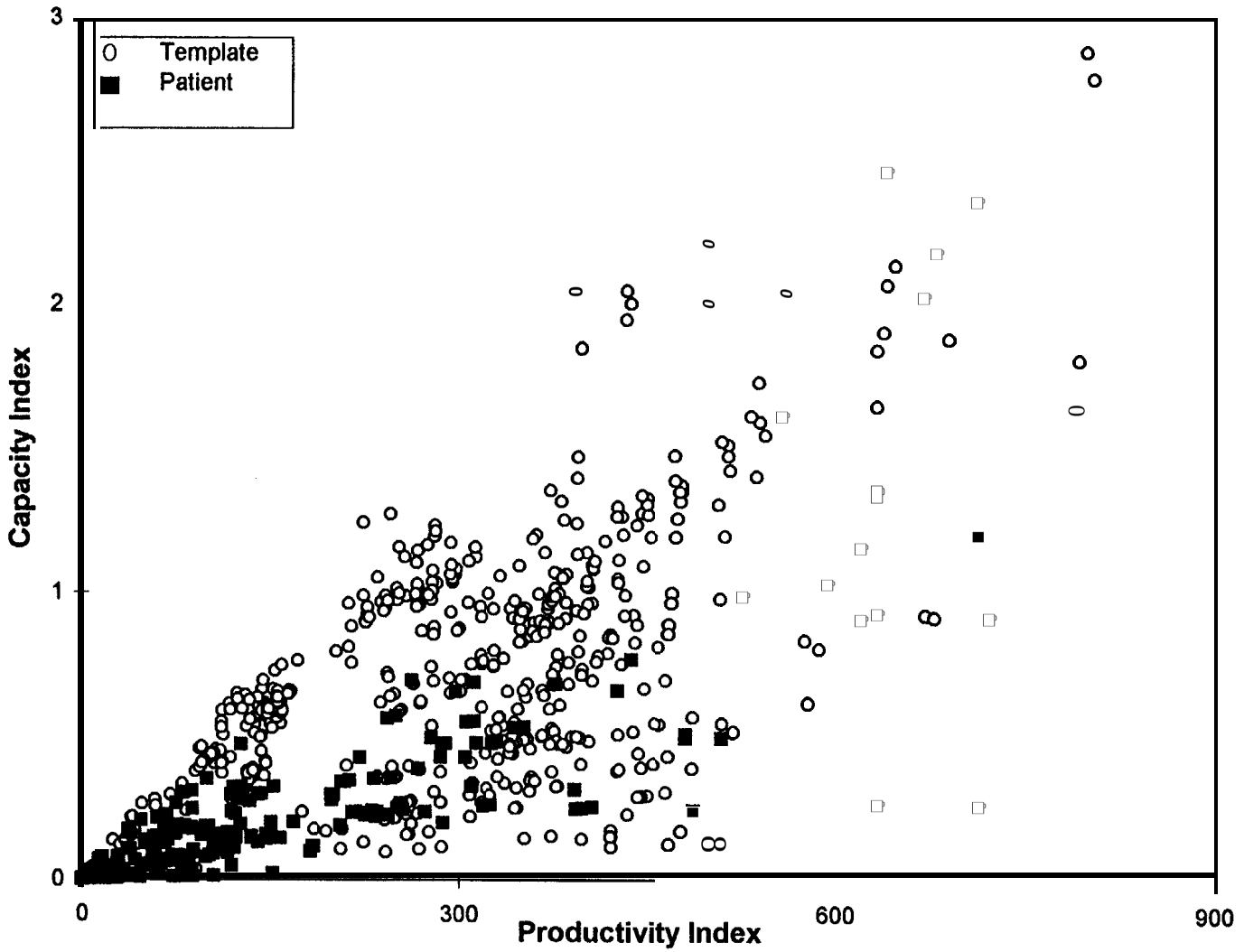


Figure 12. Comprehensive performance plot for the Grande Ronde Basin.

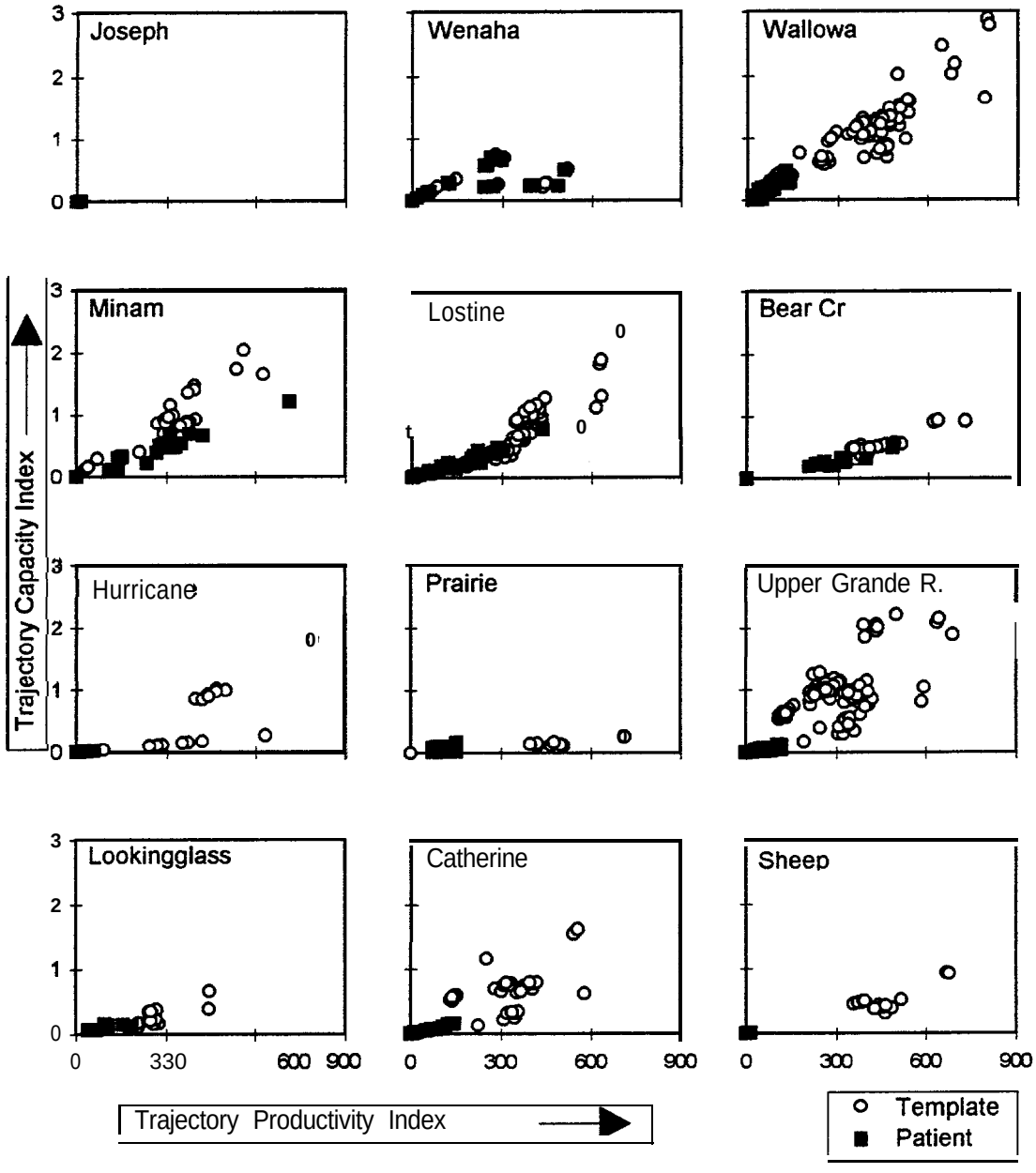


Figure 13. **Performance plots for pathways within the Grande Ronde Basin, grouped by subbasin where the spawning stage occurs.**

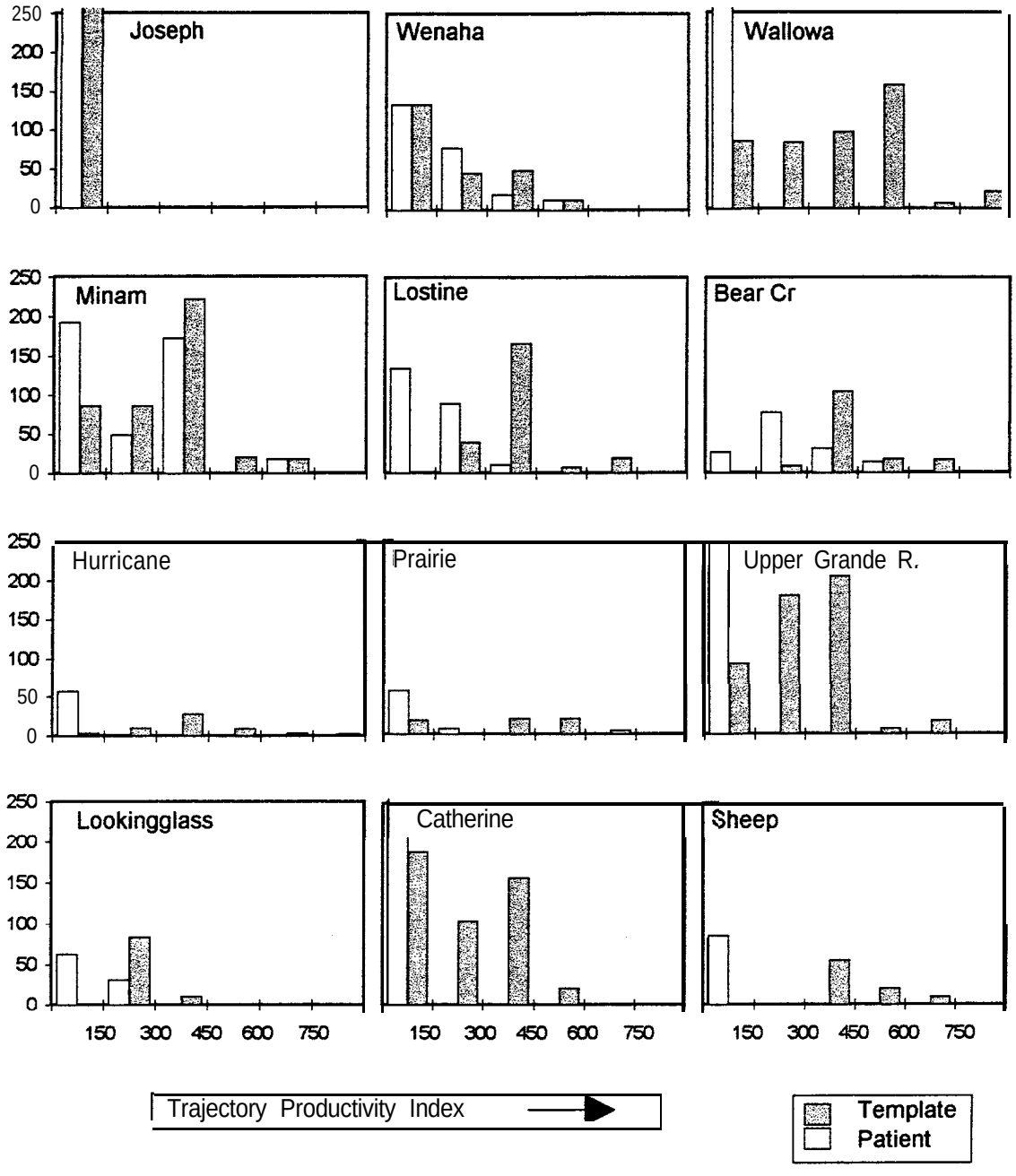


Figure 14. **Productivity frequency charts for pathways associated with spawning reaches within subbasins of the Grande Ronde Basin. Frequencies are weighted by spawning reach lengths. Shaded bars represent Template, and white bars Patient.**

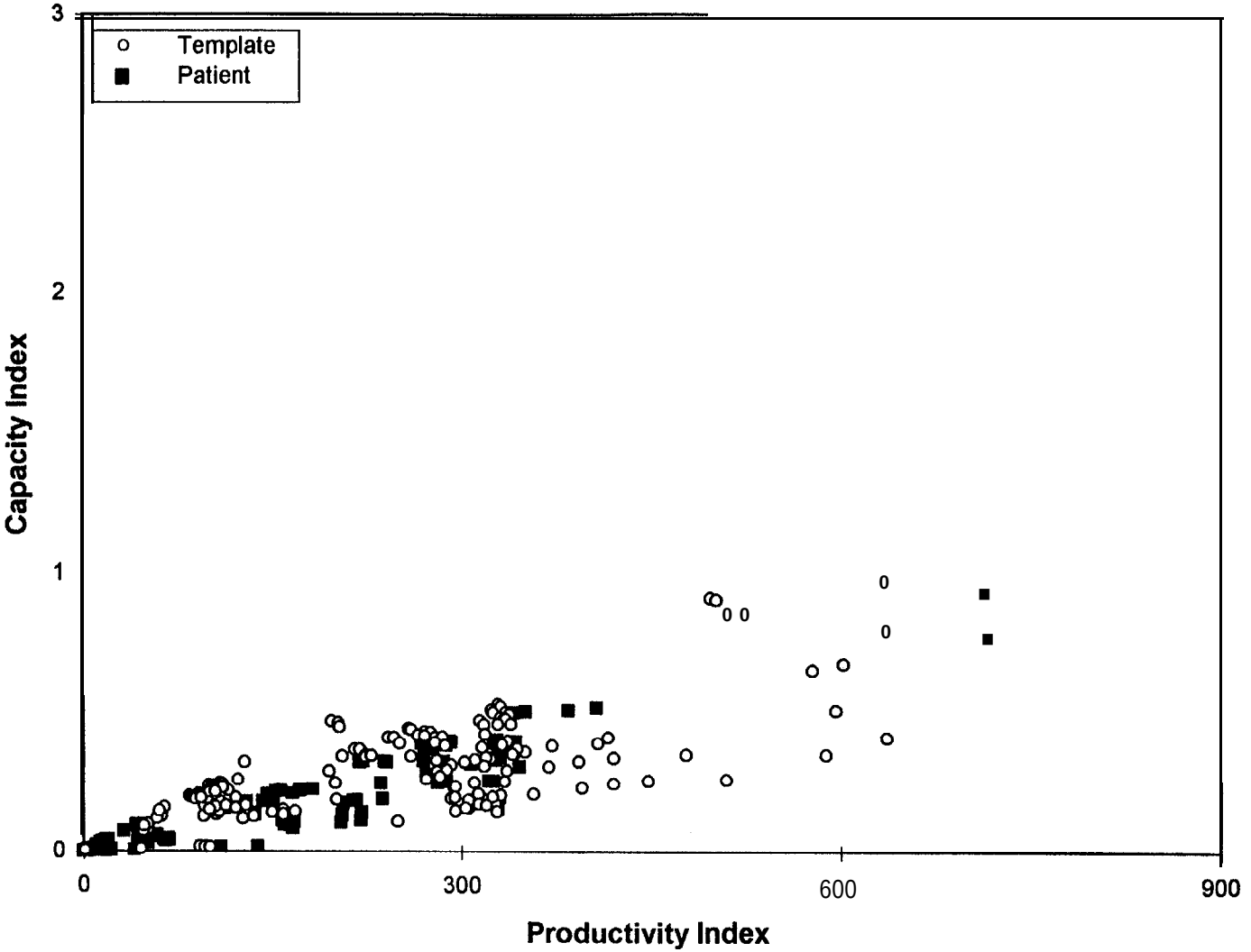


Figure 15. Comprehensive performance plot for the Imnaha Basin

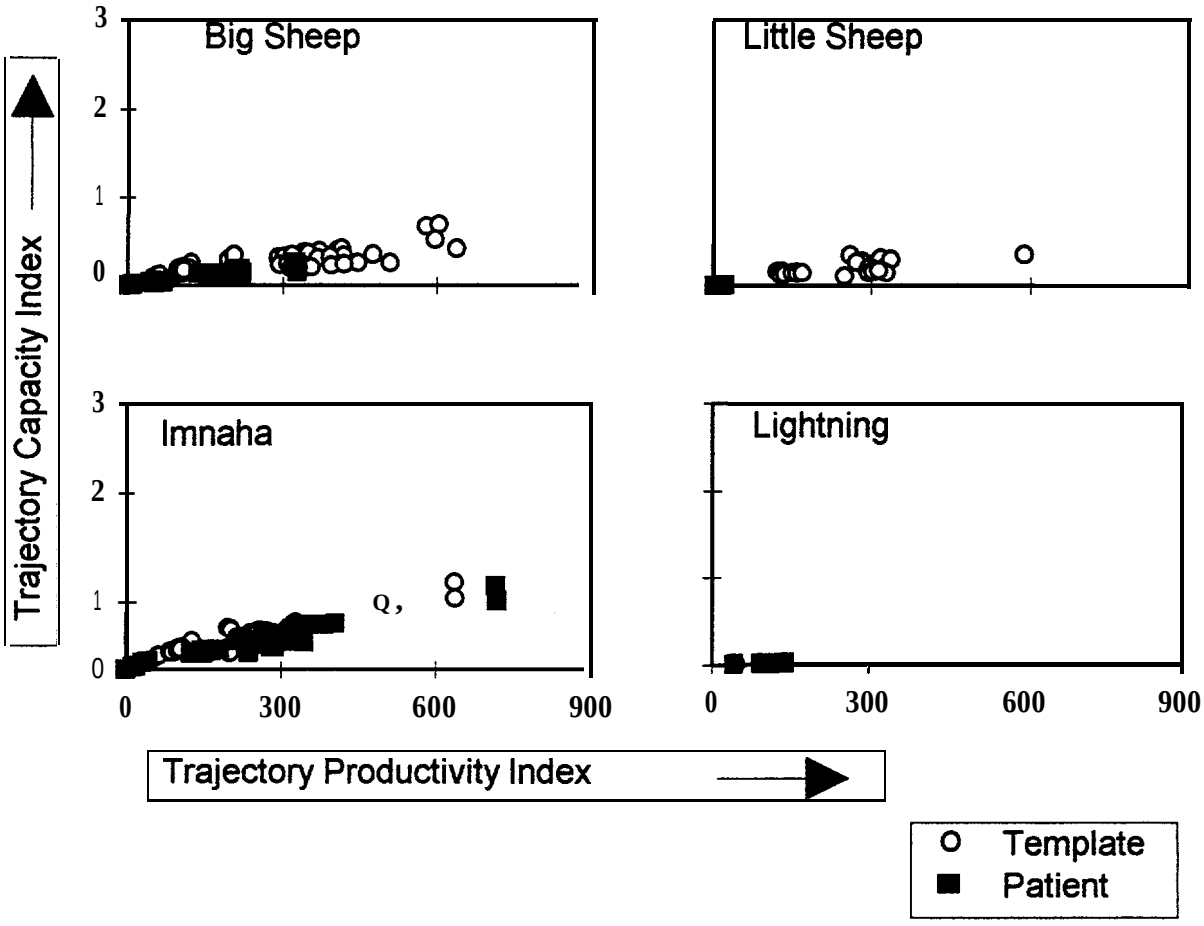


Figure 16. Performance plots for pathways within the Imnaha Basin, grouped by subbasin where the spawning stage occurs.

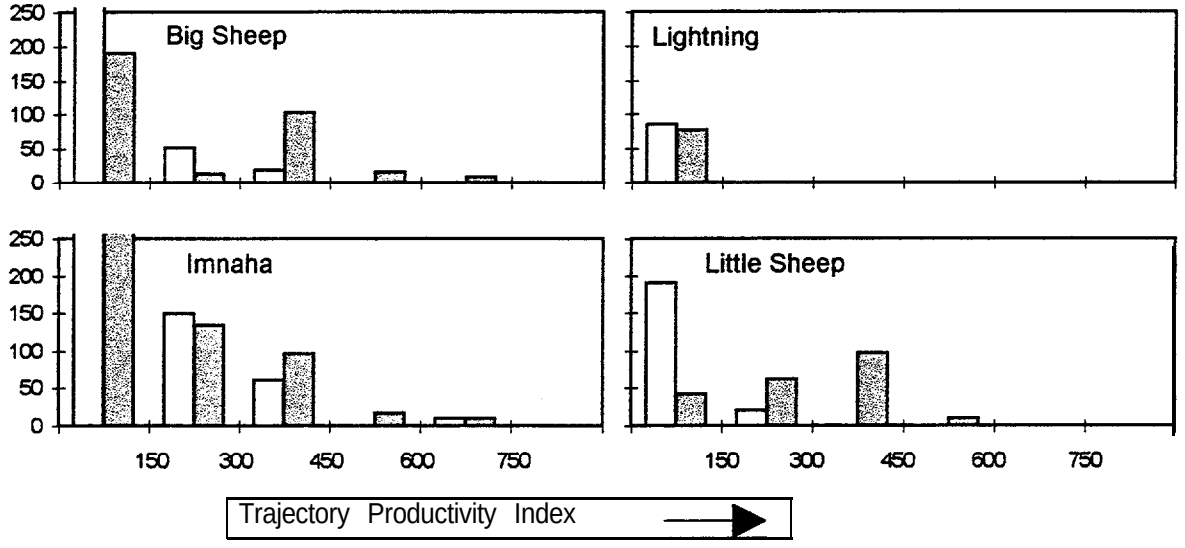


Figure 17. **Productivity frequency charts for pathways associated with spawning reaches within subbasins of the Imnaha Basin. Frequencies are weighted by spawning reach lengths. Shaded bars represent Template, and white bars Patient.**

pathways continue into the mainstem Snake and Columbia rivers, where the quality of habitat for spring chinook has also deteriorated over the past century (Lichatowich and Mobrand 1995).

Conditions within the Grande Ronde Basin to support spring chinook salmon differ significantly between subbasins (Fig. 13). The degree of habitat change (degradation from the salmon perspective) over the past 150 years also varies among subbasins. These sharp differences between subbasins have created a situation today where the Grande Ronde spring chinook population contains no strong core population to support metapopulation function in the basin. Life history pathways that remain relatively strong are associated with a few geographic areas of the basin where spawning still occurs; these areas tend to be isolated from one another, hampering metapopulation function.

A diagnostic summary follows for each of the major subbasins.

Joseph Creek Subbasin: Over the past 150 years, this subbasin appears to have been unable to sustain any level of spring chinook production. Low performance potential under Template conditions (Fig. 13) indicates that the lack of spring chinook production in this subbasin is not due to man-induced changes that occurred in the past century, either within or outside this subbasin. This subbasin appears to offers no restoration potential for spring chinook salmon.

Productivity - This component of survival for Joseph Creek (including Chesnimnus) life history pathways was historically extremely low and remains so. Water temperature\ and flow patterns appear to have always been natural impediments to survival along these pathways (Appendix C).

Capacity - This subbasin has virtually no natural capacity to produce spring chinook salmon.

Diversity - This subbasin supports virtually no diversity of life history pathways capable of producing spring chinook.

Wenaha River Subbasin: This subbasin is largely unchanged from historic conditions (Fig. 13). It offers little or no additional restoration potential for spring chinook salmon.

Productivity - This component of survival for Wenaha River life history pathways is highly variable between pathways. Some life history pathways have among the highest productivities of any current day life history pathways for the Grande Ronde basin. Other pathways appear to have very low productivity; these are associated with the lower most spawning reach or with pathways that take juveniles into the mainstem Grande Ronde for summer rearing. This variability between pathways suggests that overall productivity for fish spawned in this subbasin may be highly variable between years.

Capacity - This subbasin supports life history pathways that have some of the highest capacities of any that are currently populated in the Grande Ronde basin. These capacity levels are relatively low, however, compared to the high historic capacities of pathways in other parts of

the basin. Other life history pathways associated with the Wenaha subbasin have relatively low capacities.

Diversity - The potential for life history diversity associated with Wenaha River pathways has remained essentially unchanged compared to historic conditions. Only those life history pathways with relatively high productivity are sustainable, however, due to deterioration in habitat quality outside the basin. The subbasin has greater diversity of life history pathways than shown in Fig. 13 because the North Fork is not depicted on the chart; that reach supports life history pathways with productivities comparable to the higher values shown for the basin.

Wallowa River Subbasin (excluding tributaries to Wallowa R.): Life history pathways associated with spawning reaches in the mainstem Wallowa River show severe declines in potential salmon performance compared to historic levels (Fig. 13). Restoration potential is significant for this subbasin. The most unique feature of this subbasin compared to all others in the basin is the presence of Wallowa Lake, which historically enhanced the productivity and capacity of the subbasin for salmon. The results depicted in Fig. 13 suggest that the Wallowa River was historically the most productive subbasin within the Grande Ronde basin for spring chinook.

Productivity - This component of survival for Wallowa River life history pathways is currently low; groups of fish using these pathways appear to be at extremely high risk of extinction. This subbasin supported life history pathways under historic conditions that were the highest in the Grande Ronde basin. Major impediments to productivity (Appendix C) are sediment load, affecting both egg incubation and overwinter survival, flow patterns immediately downstream of Wallowa Lake; nutrient loading, and pathogens (whirling disease).

Capacity - The mainstem Wallowa River supports life history pathways that currently have low capacity for spring chinook. Historically, these same pathways had exceptionally high abundance, the highest of any pathway? in the Grande Ronde basin.

Diversity - The potential for life history diversity associated with Wallowa River pathways is significantly reduced compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show relatively uniform productivity and capacity at low to extremely low levels. Improvements in productivity in these stream reaches could significantly improve overall capacity for salmon within the Grande Ronde Basin.

Minam River Subbasin: Life history pathways associated with spawning reaches in the mainstem Minam River show small to moderate changes in current potential salmon performance compared to historic levels (Fig. 13).

Productivity - This component of survival differs widely between Minam River pathways. In general, within basin productivity does not appear to have changed greatly compared to

historic levels. The wide differences in productivity between pathways suggest that overall productivity for fish spawned in this subbasin may be highly variable between years.

Capacity - The capacity of Minam River life history pathways for smolt production has declined, on the average, by over half compared to historic levels. These changes are apparently due largely to cumulative effects of reductions in life history productivity.

Diversity - The current potential for life history diversity associated with Minam River pathways is reduced slightly compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show a relatively wide range in productivity and capacity. Only those life history pathways with relatively high productivity are capable of being sustained, however, due to deterioration in habitat quality outside the basin.

Lostine River Subbasin: Life history pathways associated with spawning reaches in the Lostine River show moderate to severe declines in current potential salmon performance compared to historic levels (Fig. 13). Restoration potential is significant for pathways associated with this subbasin.

Productivity - This component of survival for Lostine River life history pathways has declined substantially compared to historic levels. The subbasin supported life history pathways under historic conditions that were among the highest in the Grande Ronde basin. Major impediments to productivity (Appendix C) are altered flow patterns, channel and substrate stability, and water temperature-all of these occur in the lower reaches of the Lostine River.

Capacity - The capacity of life history pathways associated with this subbasin for smolt production has declined, on the average, by well over half compared to historic levels. These changes are apparently due largely to cumulative effects of reductions in life history productivity.

Diversity - The current potential for life history diversity associated with Lostine River pathways is reduced substantially compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show a fairly wide range in productivity and capacity, but many of the pathways have low productivity. Only those life history pathways with relatively high productivity are capable of being sustained, however, due to deterioration in habitat quality outside the basin.

Bear Creek Subbasin (tributary to Wallowa River): Life history pathways associated with spawning reaches in Bear Creek show moderate to severe losses in current potential salmon performance compared to historic levels (Fig. 13).

Productivity - This component of survival differs widely between Bear Creek pathways (Fig. 13). In general, within basin productivity has declined substantially compared to historic levels. The wide differences in productivity between pathways suggest that overall productivity for fish spawned in this subbasin may be highly variable between years. Major impediments to

productivity (Appendix C) are altered flow patterns in the lower reach of the stream, loss of habitat diversity, and altered temperature regimes.

Capacity - The capacity of life history pathways associated with this subbasin for smolt production has declined, on the average, by over half compared to historic levels. These changes are apparently due largely to cumulative effects of reductions in life history productivity and loss of key habitat in the lower reach.

Diversity - The current potential for life history diversity associated with Bear Creek pathways is reduced substantially compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show a fairly wide range in productivity and capacity. Only those life history pathways with relatively high productivity are capable of being sustained, however, due to deterioration in habitat quality outside the basin.

Hurricane Creek Subbasin: Life history pathways associated with spawning reaches in Hurricane Creek show extremely severe losses in current potential salmon performance compared to historic levels (Fig. 13). Historically, those life history pathways with the highest productivities and capacities made use of the Wallowa River for some or all of the post fry emergence stages. Restoration potential is significant for pathways associated with this subbasin.

Productivity - This component of survival for Hurricane Creek life history pathways has declined severely compared to historic levels; groups of fish attempting to use these pathways are at extremely high risk of extinction. Major impediments to productivity (Appendix C) are alterations in flow pattern, sediment load, channel and bed instability, and lack of habitat diversity.

Capacity - The current capacity of life history pathways associated with this subbasin for smolt production is a small fraction of what it was historically. These changes are due largely to cumulative effects of reductions in life history productivity.

Diversity - The current potential for life history diversity associated with Hurricane Creek pathways is only a very small fraction of what it was historically. None of the life histories examined appear capable of sustaining production.

Prairie Creek Subbasin: Life history pathways associated with spawning reaches in Prairie Creek show extremely severe losses in current potential salmon performance compared to historic levels (Fig. 13). This potential is reduced because of losses in productivity and not capacity.

Productivity - This component of survival for Prairie Creek life history pathways has declined severely compared to historic levels; groups of fish attempting to use these pathways are at extremely high risk of extinction. Major impediments to productivity (Appendix C) are sediment load and lack of habitat diversity.

Capacity - The current capacity of life history pathways associated with this subbasin for smolt production is low due to the cumulative effects of reductions in life history productivity (including loss of productivity outside Prairie Creek). The amount of key habitat has been increased in this subbasin because of flow augmentation through the irrigation system, but low productivity prevents this habitat from being used to much extent.

Diversity - The current potential for life history diversity associated with Prairie Creek pathways is low. None of the life histories examined appear capable of sustaining production..

Upper Grande Ronde Subbasin (upstream of Wallowa River, excluding tributaries to Grande Ronde R.): Life history pathways associated with spawning reaches in the upper Grande Ronde River show severe declines in potential salmon performance compared to historic levels (Fig. 13). Restoration potential is significant for this subbasin. The results depicted in Fig. 13 show that the upper Grande Ronde River was historically extremely productive for spring chinook.

Productivity - This component of survival for Grande Ronde River Iife history pathways is currently low; groups of fish using these pathways appear to be at extremely high risk of extinction. This subbasin supported life history pathways under historic conditions that were the highest in the entire Grande Ronde basin. Major impediments to productivity (Appendix C) are alterations in temperature regimes, sediment load, loss of habitat diversity, channel and bed instability, and alterations in flow patterns.

Capacity - The mainstem Grande Ronde River supports life history pathways that currently have very low capacity for spring chinook. Historically, these same pathways had exceptionally high abundance, among the highest in the Grande Ronde basin. These changes are due largely to cumulative effects of reductions in life history productivity, although the quantity of key habitat has also been reduced.

Diversity - The potential for life history diversity associated with Grande Ronde River pathways is severely reduced compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show relatively uniform productivity and capacity at low to extremely low levels. All of the life histories examined appear to be at extremely high risk of extinction. Improvements in productivity associated with stream reaches supporting these life histories would significantly improve overall sustainability and capacity for salmon within the Grande Ronde Basin.

Lookingglass Creek Subbasin: Life history pathways associated with spawning reaches in the Lookingglass Creek show moderate declines in current potential salmon performance compared to historic levels (Fig. 13).

Productivity - This component of survival for Lookingglass Creek life history pathways has declined slightly to moderately compared to historic levels. Productivity levels for these pathways are uniformly low. All of these pathways have low productivity, in part, because of losses that occur in the mainstem Grande Ronde River.

Capacity - The capacity of life history pathways associated with this subbasin for smolt production has declined, on the average, by nearly half compared to historic levels. These changes are apparently due largely to cumulative effects of reductions in life history productivity.

Diversity - The current potential for life history diversity associated with Lookingglass Creek pathways is reduced substantially compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show a relatively narrow range in productivity and capacity. Few, if any, life history pathways appear to be currently capable of sustaining production.

Catherine Creek Subbasin: Life history pathways associated with spawning reaches in Catherine Creek show severe declines in potential salmon performance compared to historic levels (Fig. 13). Restoration potential is significant for this subbasin.

Productivity - This component of survival for Catherine Creek life history pathways is currently low; groups of fish using these pathways appear to be at extremely high risk of extinction. Major impediments to productivity (Appendix C) are alterations in temperature regimes, sediment load, alterations in flow patterns, and lack of habitat diversity.

Capacity - Catherine Creek supports life history pathways that currently have low capacity for spring chinook. Historically, these same pathways had high abundance-These changes are due largely to cumulative effects of reductions in life history productivity, although the quantity of key habitat has also been reduced.

Diversity - The potential for life history diversity associated with Catherine Creek pathways is significantly reduced compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show relatively uniform productivity and capacity at low to extremely low levels. All of the life histories examined appear to be at extremely high risk of extinction. Improvements in productivity associated with stream reaches supporting these life histories would significantly improve overall sustainability and capacity for salmon within the Grande Ronde Basin.

Sheep Creek Subbasin: Life history pathways associated with spawning reaches in Sheep Creek show extremely severe losses in current potential salmon performance compared to historic levels (Fig. 13). Historically, those life history pathways with the highest productivities and capacities made use of the mainstem Grande Ronde River for some or all of the post fry emergence stages. This subbasin is currently not capable of sustaining spring chinook production. Restoration potential is significant for pathways associated with this subbasin.

Productivity - This component of survival for Sheep Creek life history pathways has declined severely compared to historic levels. Productivity is currently too low to sustain production. Major impediments to productivity (Appendix C) are alterations in temperature

regimes, sediment load, loss of habitat diversity, channel and bed instability, and alterations in flow patterns.

Capacity - Life history pathways associated with this subbasin currently appear to have virturally no capacity for smolt production. Historically, capacity for these pathways was substantial.

Diversity - No potential for life history diversity associated with Sheep Creek pathways currently exists. None of the life histories examined appear capable of sustaining production. Restoration potential for the subbasin is significant.

Imnaha Basin

The current potential of the overall Imnaha basin to produce and sustain spring chinook salmon in relation to conditions within the basin has been severely reduced compared to historic potential (Fig. 14). The large majority of life history pathways (represented by data points in Fig. 14) that historically were capable of supporting spring chinook can no longer do so, due to changes in the quality of habitat that have occurred over the past 150 years.

In general, data points for the Patient in Fig. 14 show a shift to the lower left portion of the chart, indicating that fish following these life history pathways are less able to cope with additional mortality pressures than they were historically - they have lost much of their resilience. The capacities of these pathways are also reduced, though the extent of loss appears to be relatively small.

The patterns of data points in Fig. 14 indicate that the Imnaha basin was historically a much less productive environment for spring chinook salmon than the Grande Ronde basin; both productivity and capacity were substantially less in the Imnaha. However, the loss of potential salmon performance has been much less severe in the Imnaha basin.

Life history pathways with productivity index values less than about 150 are likely at extremely high risk of extinction, given the current conditions outside of the Imnaha basin. High risk of extinction may also exist for pathways with values as high as 300. These life history pathways continue into the mainstem Snake and Columbia rivers, where the quality of habitat for spring chinook has also deteriorated over the past century (Lichatowich and Mobrand 1995).

Conditions within the Imnaha basin to support spring chinook salmon differ significantly between subbasins (Fig. 15). The degree of habitat change (degradation from the salmon perspective) over the past 150 years also varies among subbasins within the Imnaha.

A diagnostic summary follows for each of four subbasins. The subbasins examined are the mainstem Imnaha, Big Sheep, Little Sheep, and Lightning. Other relatively small tributaries exist, similar to Lightning, but were not analyzed. Results for those streams would resemble those for Lightning Creek.

Imnaha River Subbasin (excluding tributaries): Life history pathways associated with spawning reaches in the mainstem Imnaha River and South Fork show small changes in current potential salmon performance compared to historic levels (Fig. 15).

Productivity - This component of survival differs widely between Imnaha River pathways. In general, within basin productivity does not appear to have changed greatly compared to historic levels. The wide differences in productivity between pathways suggest that overall productivity for fish spawned in this subbasin may be highly variable between years.

Capacity - The overall capacity of Imnaha River life history pathways for smolt production appears to have changed little compared to historic levels. Changes that have occurred are apparently due to small reductions in life history productivity.

Diversity - The current potential for life history diversity associated with mainstem Imnaha River pathways is reduced slightly compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Life history pathways that may currently be used by spring chinook show a relatively wide range in productivity and capacity. Only those life history pathways with relatively high productivity are capable of being sustained, however, due to deterioration in habitat quality outside the basin. In general, productivities of many Imnaha life history pathways appear to fall within a range that places groups of fish following these pathways at moderate to high risk of extinction with current conditions outside the basin.

Big Sheep Creek Subbasin: Life history pathways associated with spawning reaches in Big Sheep Creek show moderate to severe declines in current potential salmon performance compared to historic levels (Fig. 15). Restoration potential is significant for pathways associated with this subbasin.

Productivity - This component of survival for Big Sheep Creek life history pathways has declined substantially compared to historic levels. The subbasin supported life history pathways under historic conditions that were among the highest in productivity in the Imnaha basin. Major impediments to productivity (Appendix C) are alterations in temperature regimes, sediment load, channel or streambed instability, and loss of habitat diversity.

Capacity - The capacity of life history pathways associated with this subbasin for smolt production has declined compared to historic levels. However, smolt capacity of these pathways appears to have always been low.

Diversity - The current potential for life history diversity associated with Imnaha River pathways is reduced substantially compared to historic conditions. The resilience of the population to withstand additional environmental changes has been lessened accordingly. Groups of fish using these life history pathways are at high to extremely high risk of extinction.

Little Sheep Creek Subbasin: Life history pathways associated with spawning reaches in Little Sheep Creek show extremely severe losses in current potential salmon performance compared to historic levels (Fig. 15). This subbasin is currently not capable of sustaining spring chinook production. Restoration potential is significant for pathways associated with this subbasin.

Productivity - This component of survival for Little Sheep Creek life history pathways has declined severely compared to historic levels. Productivity is currently too low to sustain production. Major impediments to productivity (Appendix C) are alterations in flow regimes, channel or streambed instability, changes in temperature regimes, and loss of habitat diversity, and water withdrawals.

Capacity - Life history pathways associated with this subbasin currently appear to have virtually no capacity for smolt production. Historically, capacity for these pathways was relatively low.

Diversity - No potential for life history diversity associated with Little Sheep Creek pathways currently exists. None of the life histories examined appear capable of sustaining production.

Lightning Creek Subbasin: Life history pathways associated with spawning reaches in Lightning Creek show little or no loss in current potential salmon performance compared to historic levels (Fig. 15). However, potential salmon performance associated with this subbasin is low.

Productivity - This component of survival for Lightning Creek life history pathways has declined severely compared to historic levels. Productivity is currently too low to sustain production.

Capacity - Life history pathways associated with this subbasin have very little capacity for smolt production. However, smolt capacity of these pathways appears to have always been low.

Diversity - Little life history diversity associated with Lightning Creek pathways currently exists. None of the life histories examined appear capable of sustaining production.

TREATMENT SELECTION

Purpose

The purpose of this step is to identify reach specific action priorities within the watersheds based on the diagnosis. These priorities are presented as guidelines to assist watershed planners---not as rigid rules. Under these guidelines, each reach is assigned to an action priority category. Results are given as four sets of reference tables (Appendices D-G).

Application of Prioritization Principles

A general set of principles for applying these guidelines is described under "Prioritization Principles" earlier in this document; we refer to the EDT Primer (Lestelle et al. 1996) for a more complete description. In simplest terms, these principles call for setting the following strategic priorities within each watershed: first, maintain the performance of existing life histories; second, improve the performance of existing life histories; and third, restore lost life histories.

These principles give the two highest priorities to *maintaining* and *improving* existing quality and quantity of habitat associated with the primary and secondary life histories of spring chinook in the basins. These life histories are still populated: therefore, we assume that these should be protected and enhanced as a starting point in watershed restoration.

Primary and secondary life histories are those that utilize pathways in the watershed still capable of supporting spring chinook production. Fish continue to use these pathways because their connecting habitats have been able, so far, to sustain spring chinook populations. These are also the pathways with the greatest potential to continue to support spring chinook populations in the immediate future. Pathways incapable of sustaining salmon are either unpopulated or act as survival "drains" or impediments to long term sustainability.

The third strategic priority calls for restoring life history pathways that have been lost to the population. These vacant pathways can generally not be repopulated (through supplementation or otherwise) without first restoring quality (and perhaps quantity) of habitat so that it can support and sustain fish production. Restoration of vacant life histories may be required in the long term, in order to meet model watershed objectives and to restore metapopulation function for the salmon in the basin.

These strategic priorities are intended to direct efforts where they are likely to derive the most benefit. Watershed improvement efforts should be guided by a long-term vision if salmon are to be restored. The priorities suggested here should be viewed as constructive advice on how to invest in salmon restoration, not as rigid rules. It is important to take advantage of special opportunities (that are consistent with the diagnosis) and also to periodically review the prioritization principles.

Overview of Treatment Identification Steps

The procedure for identifying reach specific action priorities has four steps: 1) classify each life history pathway used in the diagnostic analyses (Appendices A and B) as primary, secondary, or vacant; 2) assign a weighting factor to each pathway, based on current usage (relative abundance of fish), or in the case of vacant pathways, based on potential production; 3) compute cumulative usage scores and habitat productivity loss scores for each stream reach within each basin; and 4) plot scores and assign priority to each reach based on its potential for improving spring chinook performance.

Summary results are tabulated in a set of reference tables (Appendices D-G). The purpose of these tables is to help identify a) the stream reaches where improvements are most likely to produce benefits to spring chinook salmon, and b) the habitat attributes within those reaches that need to be addressed.

Step 1: Classification of Life History Pathways

All life history pathways used in the diagnostic analyses (Appendices A and B) are classified as primary, secondary, or vacant on the basis of the average spawner abundance in recent years and on the basis of observed life history patterns in the basins.

First pathways with cumulative (Patient) productivities too small (< 50) to possibly sustain populations of salmon are eliminated. Information listed in Appendices A and B is used for this purpose. Based upon personal observations, biologists working in the basin determine which of the remaining pathways are still populated and classify them as either primary (those that support most of the remaining spring chinook) or secondary (those that are used to lesser degree, perhaps intermittently). All other pathways are classified as vacant.

Step 2: Assignment of Weighting Factors for Computation of Relative Importance of Reaches

Weighting factors are assigned to each populated life history pathway based on whether it is primary (weight = 2) or secondary (weight = 1) and on the relative spawner abundance. Using spawning survey information and personal observations, team members categorize life history pathways into four relative abundance levels. For example, a primary pathway with the lowest relative abundance are given a weight of 2.1, while the same pathway having the most relative abundance are given a weight of 2.4. Hence primary and secondary life history pathways are organized into eight different weight categories: 1.1, 1.2, 1.3, 1.4, 2.1, 2.2, 2.3, or 2.4.

Vacant life history pathways are categorized into two groups of relative potential abundance based on their cumulative capacity index values under template conditions (the breakpoint was an index value of 1 .O). Lower index values are given a weight of 0.1, while greater values are assigned a weight of 0.15. Since reach length is not incorporated in the cumulative capacity

index, weights are also applied for the length of the spawning reach associated with each pathway.

Step 3: Computation of Reach Scores

To get a better sense for the relative importance of each stream reach in prioritizing habitat improvements two "scores" are computed: 1) a chinook usage score reflecting the combined usage by all life history pathways of the reach; and 2) a habitat productivity change score reflecting the percent change in productivity between Template and Patient conditions. These scores provide a means for comparing the potential benefit to spring chinook performance of improvements in different stream reaches in the basin.

The usage score is computed as the weighted sum of the lengths of time (in weeks) that the reach was used by each pathway, where pathways were weighted as described in step 2.

The habitat productivity change score is computed as the weighted sum of the percentage change in productivity between Template and Patient for the segment of each pathway passing through the reach, with each pathway weighted as described in step 2.

Step 4: Review of Reach Importance Plots

The two types of scores for each stream reach are plotted for primary and secondary life history pathways (combined on one plot) and for vacant pathways.

The plots provide a convenient way of categorizing the relative benefits that would accrue to spring chinook abundance and sustainability by targeting actions in different reaches within a basin.

Fig. 18 compares chinook usage (Y-axis) and habitat change (X -axis) scores for primary and secondary life histories among the reaches in the Grande Ronde and Imnaha basins. Each data point represents one stream reach. The rectangle marked "A" contains the reaches that have the highest utilization by life history pathways and also the greatest loss in habitat quality. Actions aimed at improving habitat quality in these reaches would most likely produce the greatest benefit to chinook abundance and sustainability. Rectangles marked "B", "C", "D", "E", and "F" categorize other reaches in declining order of potential benefits from habitat improvements.

Fig. 19 compares reaches in the Grande Ronde and Imnaha basins in terms of their potential to contribute to restoration of vacant life history pathways. Each data point represents one stream reach. Rectangles marked "A", "B", "C", "D", "E", and "F" categorize stream reaches in declining order of benefits (to vacant life histories) from habitat quality improvements.

In Appendices D - G, the categories "A" through "F' are referred to as "Restoration benefit categories".

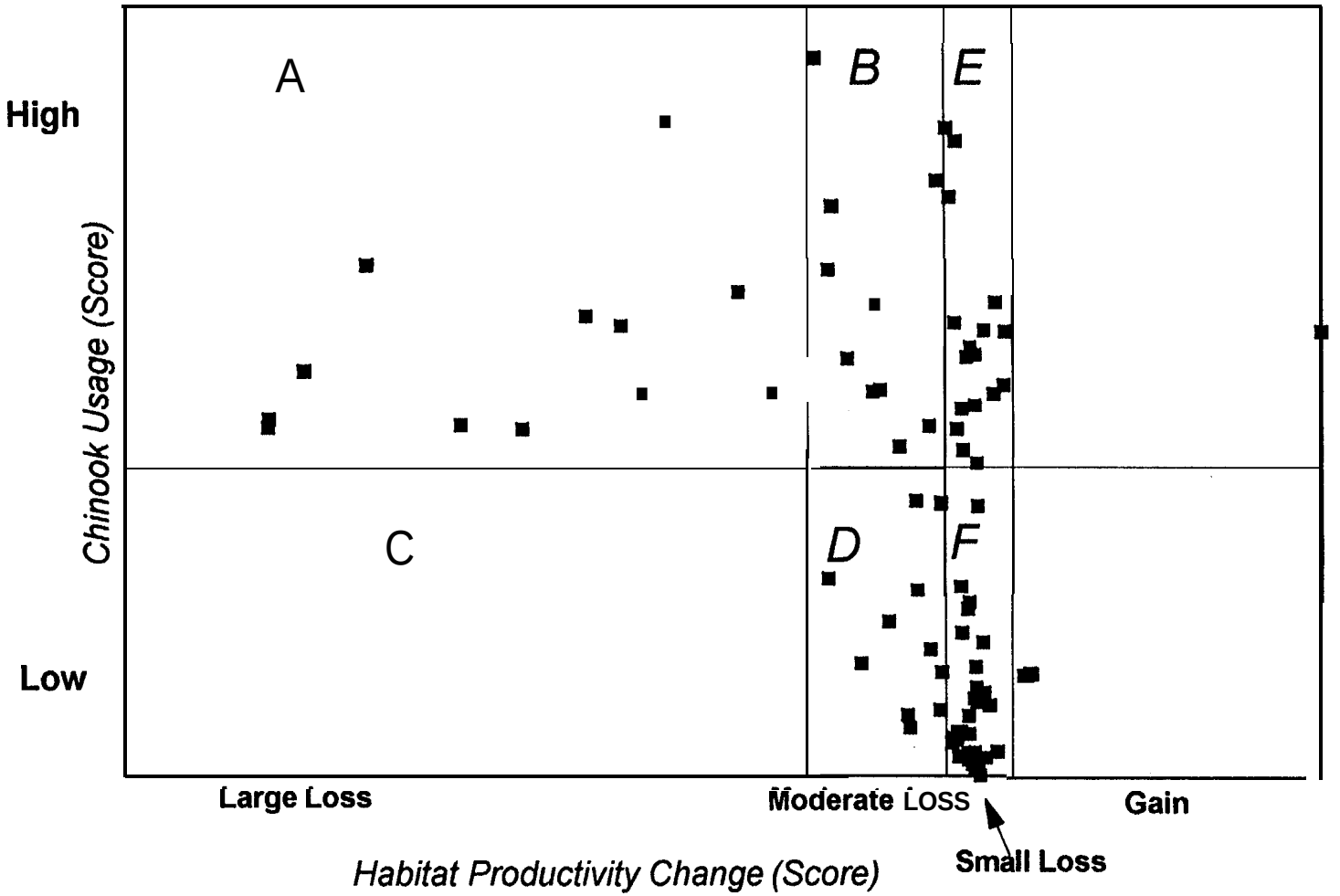


Figure 18. Potential benefits to primary and secondary life histories from reach specific habitat quality improvements in the Grande Ronde and Imnaha basins. Each point in the graph represent one stream reach. The rectangle marked "A" contains the reaches that are most important to chinook salmon and have suffered the most severe loss of habitat quality. The benefit categories are defined in the text.

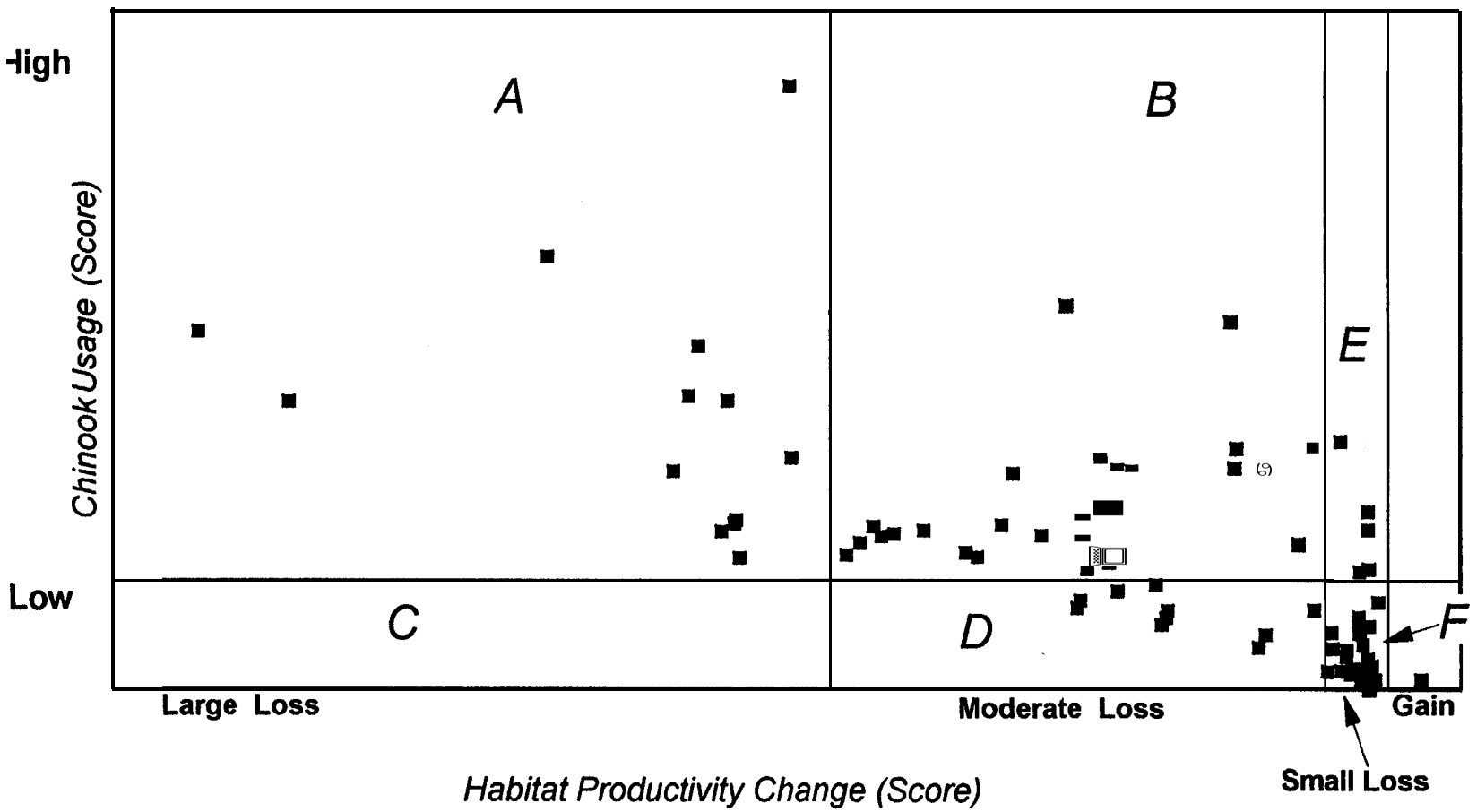


Figure 19. Potential benefits to lost (vacant) life histories from restoration of spring chinook performance characteristics in specific reaches in the Grande Ronde and Imnaha basins. Each point in the graph represents one stream reach. The categories defined by the rectangles and marked with the letters *A* - *F* are discussed in the text.

Guide to Targeting Reach Specific Actions

Strategic priorities for targeting reach specific actions are aimed at either maintaining the performance of existing life histories, improving the performance of existing life histories, or restoring lost life histories.

Actions Intended to Maintain Performance of Existing Life Histories

The GREDT work group suggests that maintenance of all existing life histories should be the highest priority. Appendices D (Grande Ronde) and F (Imnaha) identify the reaches that are used by existing life histories. The chinook usage index shown in these appendices also provide a sense of the relative importance of each reach to those life histories. The reaches with the highest chinook usage scores are most important to the maintenance of spring chinook performance.

Actions Intended to Improve Performance of Existing Life Histories

Appendices D (Grande Ronde basin) and F (Imnaha basin) summarize the importance of each reach to existing spring chinook life histories. One table for each stream reach is provided. Tables are arranged alphabetically by stream reach for easy reference. Included in each table is the restoration benefit category ("A" through "F") of the reach. Reaches in category "A" should be the highest priority for habitat quality improvement.

Each table also includes detailed information by life history stage and relevant time of year about the number of primary and secondary life history pathways that utilize the reach (by relative abundance), percent loss of key habitat, and habitat productivity loss. Finally, each table identifies the specific environmental attributes that have affected the loss in productivity.

Table 6 shows an example of one of the reference tables from Appendix D, the South Fork Catherine Creek. The table indicates that the reach is assigned to benefit category B, implying that it is of high importance to existing life histories and that it has experienced a moderate loss in spring chinook productivity (see Figure 18). Only reaches belonging to category A might offer greater potential for improvement, since here the productivity loss is greater and therefore perhaps also the opportunity for increasing habitat quality.

Actions aimed at improving the quality of egg incubation habitat would offer the greatest benefit to spring chinook (habitat productivity loss score of -166.8; relevant months would be October through March), followed by actions aimed at improving an earlier time period (August through October) that affect the pre-spawning, spawning, and incubation life stages, and so on.

If actions were to be taken to improve the incubation environment, the most important attribute to target would be sediment load, followed by flow patterns, water temperature, and channel stability. By far, the greatest impediment to productivity is considered to be sediment load.

Table 6. **Sample table showing evaluation of a reach based on its importance to primary and secondary life history pathways.**

Stream: Catherine Cr.
Reach: South Fork Catherine Cr (RM 164.4 - 166.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	740.4	Habitat productivity loss score:	-427.9

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no	1	2	3	4	Secondary: Total no	1	2	3	4	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	24	0	24	0	0	24	0	24	0	0	3.0	0.0	-43.0
1,2,3	Aug-Ott	40	0	40	0	0	40	0	40	0	0	2.0	0.0	-99.4
3	Oct-Mar	80	0	80	0	0	80	0	80	0	0	2.0	0.0	-166.8
3,4	Mar-May	20	0	20	0	0	20	0	20	0	0	3.5	0.0	-80.5
5	May-Oct	46	0	46	0	0	48	0	48	0	0	3.1	0 0	1.4
6	Oct-Mar	0	0	0	0	0	19	0	19	0	0	2.0	0.0	-40.0
7	Mar-Jun			0	0	o	o	o	o	0	0	11.0	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	16.7	TEMP	83						
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0	TEMP	25.0						
3	Oct-Mar	SEDLD	50.0	FLOW	25.0	TEMP	25.0	CSTAB	12.5	PATH0	12.5		
3,4	Mar-May	FLOW	25.0	PATHO	25.0	SEDLD	25.0	CSTAB	12.5	TEMP	12.5		
5	May-Oct	FLOW	25.0	PATHO	25.0								
6	Oct-Mar	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	HABD	25.0	PATHO	25.0		
7	Mar-Jun												

Abundance *level* refers lo the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: O-l 0 spawners
Level 2: IO-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1 - prespawner; 2 - spawner; 3 - incubation; 4 - fry colonization; 5 - summer rearing; 6 - overwintering; 7 - yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATH0 - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Actions Intended to Restore Performance of Vacant Life Histories

The information needed to set stream reach specific priorities for restoring spring chinook performance in vacant life history pathways are provided in Appendices E (Grande Ronde) and G (Imnaha). One table is provided for each stream reach. Tables are arranged alphabetically by stream reach for easy reference.

Each table lists the benefit category (based on Fig. 19), chinook usage score, and habitat productivity loss score for the associated reach. The same information is provided as that given in Appendices D and F.

Table 7 is an example of one of the reference tables in Appendix E, the South Fork Catherine Creek. This reach is assigned to benefit category F, meaning that it is given relatively low priority for restoring vacant life histories. This low benefit category suggests that habitat quality improvements in this reach would be of little value to vacant life histories, as indicated above however existing ones would benefit significantly.

Actions aimed at improving the quality of egg incubation habitat would offer the greatest benefit to achieve a restoration objective (habitat productivity loss score of -20.9; relevant months would be October through March), followed by actions aimed at improving the earlier time period (August through October) that affect the prespawning, spawning, and incubation life stages, and so on.

If actions were to be taken to improve the incubation environment, the most important attribute to target would be sediment load, followed by flow patterns, water temperature, and channel stability. By far, the greatest impediment to improving productivity was considered to be sediment load.

Table 7. Sample table showing evaluation of a reach based on its importance to vacant life history pathways.

Stream: Catherine Cr.
Reach: South Fork Catherine Cr (RM 164.4 - 166.8 from Snake R)

Restoration benefit category:	F	**Chinook usage score:**	3.0	**Habitat productivity loss score:**	-42.4

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	3.0	0.0	-5.4
1,2,3	Aug-Oct	10	10	0	0	2.0	0.0	-12.4
3	Ott-Mar	20	20	0	0	2.0	0.0	-20.?
3,4	Mar-May	2	2	0	0	3.0	0 0	-3.7
5	May-Oct	N A	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	' N i i
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): All 1	% change	All 2	% change	All 3	% change	All 4	% change	All 5	% change	All 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	16.7	TEMP	6.3						
1,2,3	Aug-Ott	SEDLD	50.0	FLOW	25.0	TEMP	25.0						
3	Ott-Mar	SEDLD	50.0	FLOW	25.0	TEMP	25.0	CSTAB	12.5	PATHO	12.5		
3,4	Mar-May	FLOW	25.0	SEDLD	25 .0	CSTAB	12.5	PATH0	12.5	TEMP	12.5		
5	May-Ott	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA

Abundance level refers lo estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this **table:**

Level 1: Low lo average (relative lo other reaches) abundance
Level 2: High (relative lo other reaches) abundance
Level 3: Exceptionally high (relative lo other reaches) abundance

Life stages: 1 - prespawner; 2 - spawner; 3 - incubation; 4 - fry colonization; 5 - summer rearing; 6 - overwintering; 7 - yearling **presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATH0 - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - waler temperature
WITH - waler withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

The Appendices that follow provide the information necessary to prioritize activities to improve habitat conditions in the Grande Ronde and Imnaha basins from the spring chinook perspective. This information takes into account the habitat conditions throughout these basins, the requirements of spring chinook at each life stage, and the connectivity of habitat segments. It contrasts the present condition (Patient) with a historic reference condition (Template). The information in this report greatly increases our ability to set biologically and economically sound priorities, simply because it is based upon a logical framework. We need to keep in mind however that there is still uncertainty associated with both the information and the framework, and in the spirit of adaptive management we must continue to question and improve our knowledge. For example the implications of a metapopulation structure on the prioritization of restoration of vacant life histories is not yet fully understood for spring chinook in the Grande Ronde/Imnaha basins. We hope and expect that this will be an area of further development.

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APPENDIX A

Productivity and Capacity Profiles for **Life History Pathways** in the **Grande Ronde River** and Tributaries

Spawning reaches analyzed in the Grande Ronde, Iisted in the order they appear in Appendix A.

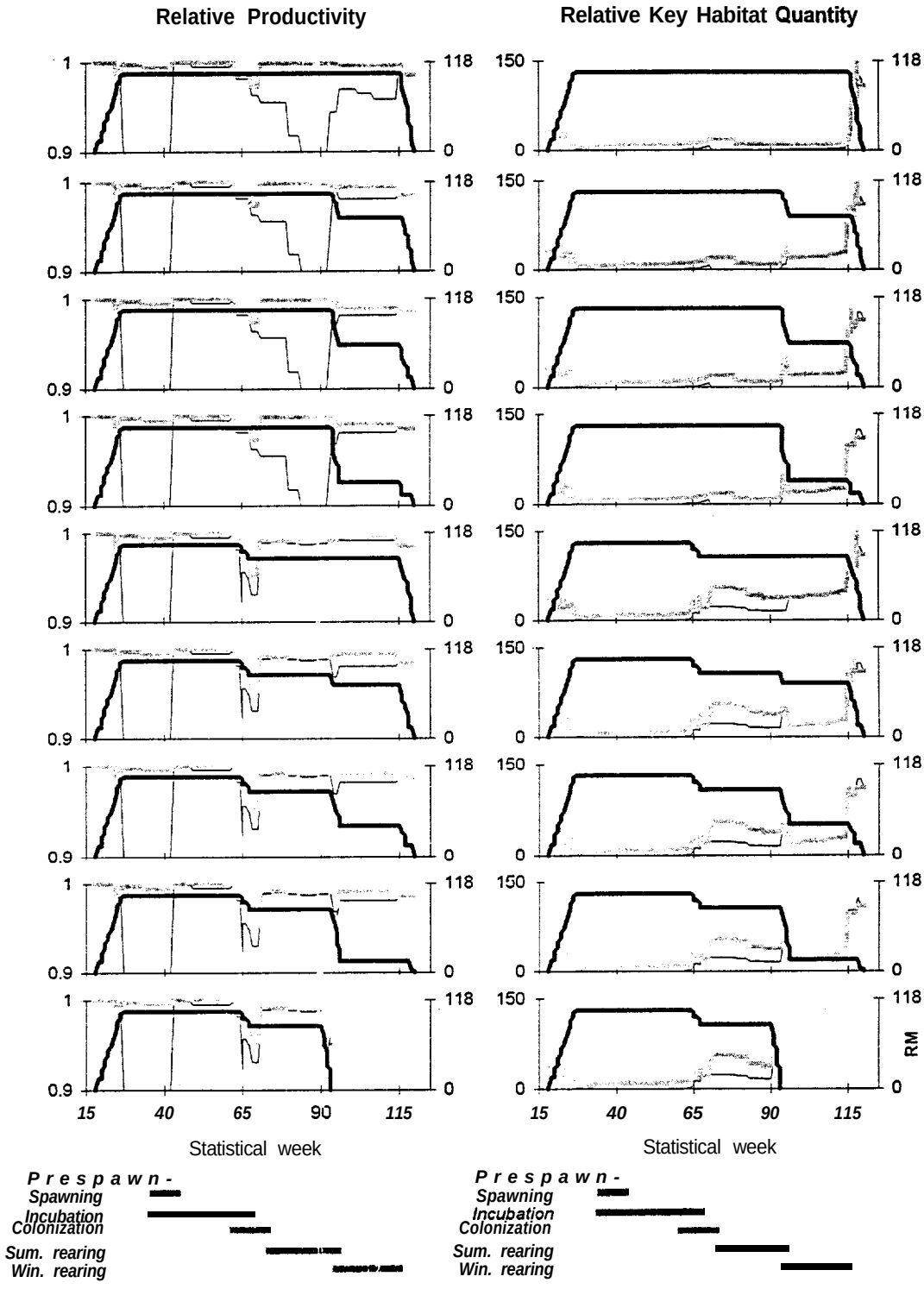
Stream	Reach
Bear Cr.	Mouth - Chamberlain Ditch (RM 101.8 - 104.7 from Snake R)
Bear Cr.	Chamberlain Ditch - Little Bear Cr (RM 104.7 - 109.3 from Snake R)
Bear Cr.	Little Bear Cr - headwaters (RM 109.3 - 118.3 from Snake R)
Catherine Cr.	Mouth - 10th Street Bridge in Union (RM 114.5 - 146.0 from Snake R)
Catherine Cr.	10th Street Bridge in Union - Little Catherine Cr (RM 146.0 - 157.5 from Snake R)
Catherine Cr.	Little Catherine Cr - forks (RM 157.5 - 164.4 from Snake R)
Catherine Cr.	South Fork Catherine Cr (RM 164.4 - 166.8 from Snake R)
Grande Ronde R.	Joseph Cr - Buford Cr (RM 3.7 - 26.2 from Snake R)
Cirande Ronde R.	Buford Cr - Bear Cr (RıM 26.2 - 28.2 from Snake R)
Grande Ronde R.	Bear Cr - Menatchee Cr (RM 28.2 - 34.8 from Snake R)
Grande Ronde R.	Menatchee Cr - Wenaha R (RM 34.8 - 45.1 from Snake R)
Grande Ronde R.	Wenaha R - Courtney Cr (RM 45. 1- 46.2 from Snake R)
Grande Ronde R.	Courtney Cr - Mud Cr (RM 46.2 - 5 1.4 from Snake R)
Grande Ronde R.	Mud Cr - Wallupa/Wildcat Cr (RM 5 1.4 - 52.8 from Snake R)
Grande Ronde R.	Wallupa/Wildcat Cr - Grossman Cr (RM 52.8 - 6 I. 1 from Snake R)
Grande Ronde R.	Grossman Cr - Wallowa R (RM 6 I. 1- 80.0 from Snake R)
Grande Ronde R.	Wallowa R - Lookingglass Cr (RM 80.0 - 83.4 from Snake R)
Grande Ronde R.	Lookingplass Cr - Gordon Cr (RM 83.4 - 94.2 from Snake R)
Grande Ronde R.	Gordon Cr - Phillips Cr (RM 94.2 - 96.9 from Snake R)
Grande Ronde R.	Phillips Cr - Clark Cr (RM 96.9 - 97.3 from Snake R)
Grande Ronde R.	Clark Cr - Indian Cr (RM 97.3 - 99.3 from Snake R)
Grande Ronde R.	Indian Cr - Willow Cr (RM 99.3 - 103.5 from Snake R)
Grande Ronde R.	Willow Cr - downstream end of State Ditch (RM 103.5 - 114.5 from Snake R)
Grande Ronde R.	Downstream end of State Ditch - Upstream end of State Ditch (RM 114.5 - 118.9 from Snake R)
Grande Ronde R.	Upstream end of State Ditch - I-84 crossing below Devil's Slide (RM 118.9 - 128.4 from Snake R)
Grande Ronde R.	I-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 - 133.4 from Snake R)
Grande Ronde R.	Five Points Cr - Rock Cr (RM 133.4 - 133.8 from Snake R)
Grande Ronde R.	Rock Cr - Whiskey Cr (RM 133.8 - 136.6 from Snake R)
Grande Ronde R.	Whiskey Cr - Jordan Cr (RM 136.6 - 139.1 from Snake R)
Grande Ronde R.	Jordan Cr - Beaver Cr (RıM 139. I - 145.8 from Snake R)
Grande Ronde R.	Beaver Cr - Meadow Cr (RM 145.8 - 147.0 from Snake R)
Grande Ronde R.	Meadow Cr - Fly Cr (RM 147.0 - 151.3 from Snake R)
Grande Ronde R.	Fly Cr - head of canyon 1.3 miles downstream of Sheep Cr (RM 151.3 - 159.4 from Snake R)
Grande Ronde R.	Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 - 164.2 from Snake R)
Grande Ronde R.	LimberJim Cr - Clear Cr (RM 164.2 - 166.9 from Snake R)
Grande Ronde R.	Clear Cr - headwaters (RM 166.9 - 170.1 from Snake R)
Hurricane Cr.	Mouth - Lower Alderslope Ditch (RM 12 I .9 - 124.9 from Snake R)
Hurricane Cr.	Lower Alderslope Ditch - Upper Alderslope Ditch Diversion (RM 124.9 - 128.2 from Snake R)
Joseph Cr.	Cottonwood Cr - Swamp Cr (RM 8.2 - 37.7 from Snake R)
Joseph Cr.	Swamp Cr - Chesnimnus Cr (RM 37.7 - 52.7 from Snake R)
Chesnimnus Cr.	Confluence with Crow Cr - South Fork (RM 52.7 - 77.7 from Snake R)
Lookingglass Cr.	Mouth - Little Lookinpglass Cr (RM 83.4 - 87.6 from Snake R)
Lookingglass Cr.	Little Lookingglass Cr - headwaters (RM 87.6 - 93.8 from Snake R)
Lostine R.	Mouth - Clearwater Ditch (RM 105.8 - 108.3 from Snake R)
Lostine R.	Clearwater Ditch - Cross Country Ditch (RM 108.3 - 110.8 from Snake R)
Lostine R.	Cross Country Ditch - Sheep Ridge Dam (RM 110.8 - 115.0 from Snake R)
Lostine R.	Sheep Ridge Dam - Silver Cr (RM 115.0 - 120.0 from Snake R)
Lostine R.	Silver Cr - Lake Cr (RM 120.0 - 124.6 from Snake R)
Lostine R.	Lake Cr - East Lostine R (RM 124.6 - 131.7 from Snake R)

Spawning reaches analyzed in the Grande Ronde, listed in the order they appear in Appendix A.

Stream	Reach
Minam R.	Mouth - Cougar Cr (RM 89.8 - 99.4 from Snake R)
Minam R.	Cougar Cr - Little Minam R (RM 99.4 - 108.4 from Snake R)
Minam R.	Little Minam R - splash dam site (1 m above Garwood Cr; RM 108.4 - 119.7 from Snake R)
Minam R.	Splash dam site - falls (RM 119.7 - 138.0 from Snake R)
Prairie Cr.	Mouth - OK Gulch confluence (RM 126.8 - 13 1.8 from Snake R)
Prairie Cr.	OK Gulch fork (RM 13 1.8 - 133.8 from Snake R)
Sheep Cr.	Mouth - Chicken Cr (RM 164.2 - 165.7 from Snake R)
Sheep Cr.	Chicken Cr - headwaters (RM 165.7 - 173.7 from Snake R)
Wallowa R.	Mouth - Minam R (RM 80.0 - 89.8 from Snake R)
Wallowa R.	Minam R - Deer Cr (RM 89.8 - 90.8 from Snake R)
Wallowa R.	Deer Cr - Dry Cr (RM 90.8 - 98.3 from Snake R)
Wallowa R.	Dry Cr - Bear Cr (RM 98.3 - 101.8 from Snake R)
Wallowa R.	Bear Cr - Whiskey Cr (RM 101.8 - 103.9 from Snake R)
Wallowa R.	Whiskey Cr - Lostine R (RM 103.9 - 105.8 from Snake R)
Waliowa R.	Lostine R - Parsnip Cr (RM 105.8 - 109.0 from Snake R)
Wallowa R.	Parsnip Cr - Hurricane Cr (RM 109.0 - 12 I .9 from Snake R)
Wallowa R.	Hurricane Cr - Lower Alderslope Ditch (RM 12 1.9 - 126.8 from Snake R)
Wallowa R.	Lower Alderslope Ditch - Wallowa Lake (RM 126.8 - 130.8 from Snake R)
Wenaha R.	Mouth - Crooked Cr (RM 45.1 - 5 I .8 from Snake R)
Wenaha R.	Crooked Cr - Fait-view Cr (RM 5 1.8 - 55.3 from Snake R)
Wenaha R.	Fairview Cr - forks (RM 55.3 - 65.9 from Snake R)
Wenaha R.	South Fork Wenaha R (RM 65.9 - 72.4 from Snake R)

Spawning reach: Bear Cr.

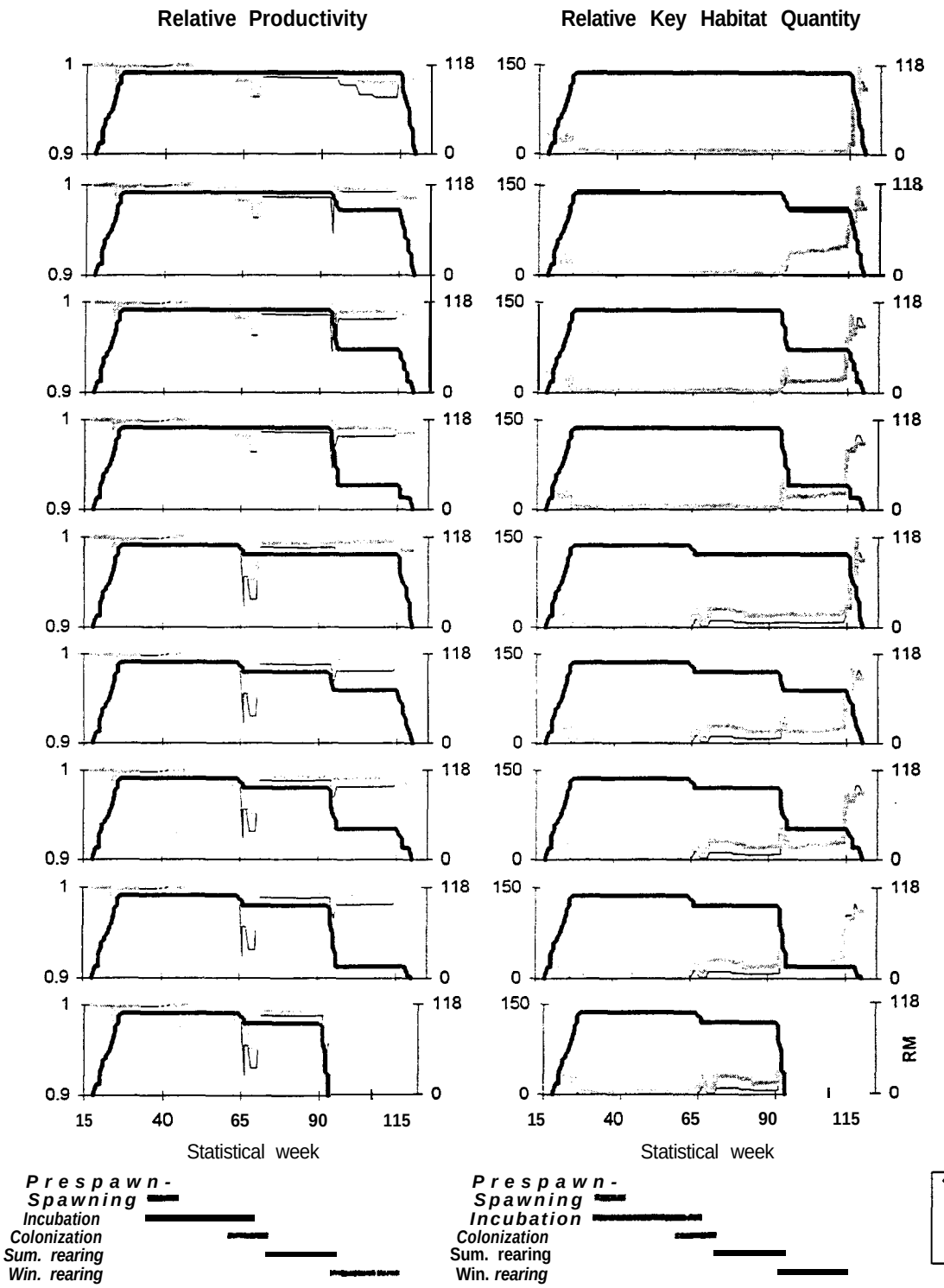
Mouth - Chamberlain Ditch (RM 101.8 - 104.7 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
509	0.54
0	0.00
Traj. #2	
486	0.57
0	0.00
Traj. #3	
439	0.51
0	0.00
Traj. #4	
460	0.54
0	0.00
Traj. #5	
375	0.53
0	0.00
Traj. #6	
377	0.52
0	0.00
Traj. #7	
355	0.49
0	0.00
Traj. #8	
353	0.49
0	0.00
Traj. #9	
635	0.93
0	0.00

Spawning reach: Bear Cr.

Chamberlain Ditch - Little Bear Cr (RM 104.7 - 109.3 from Snake R)

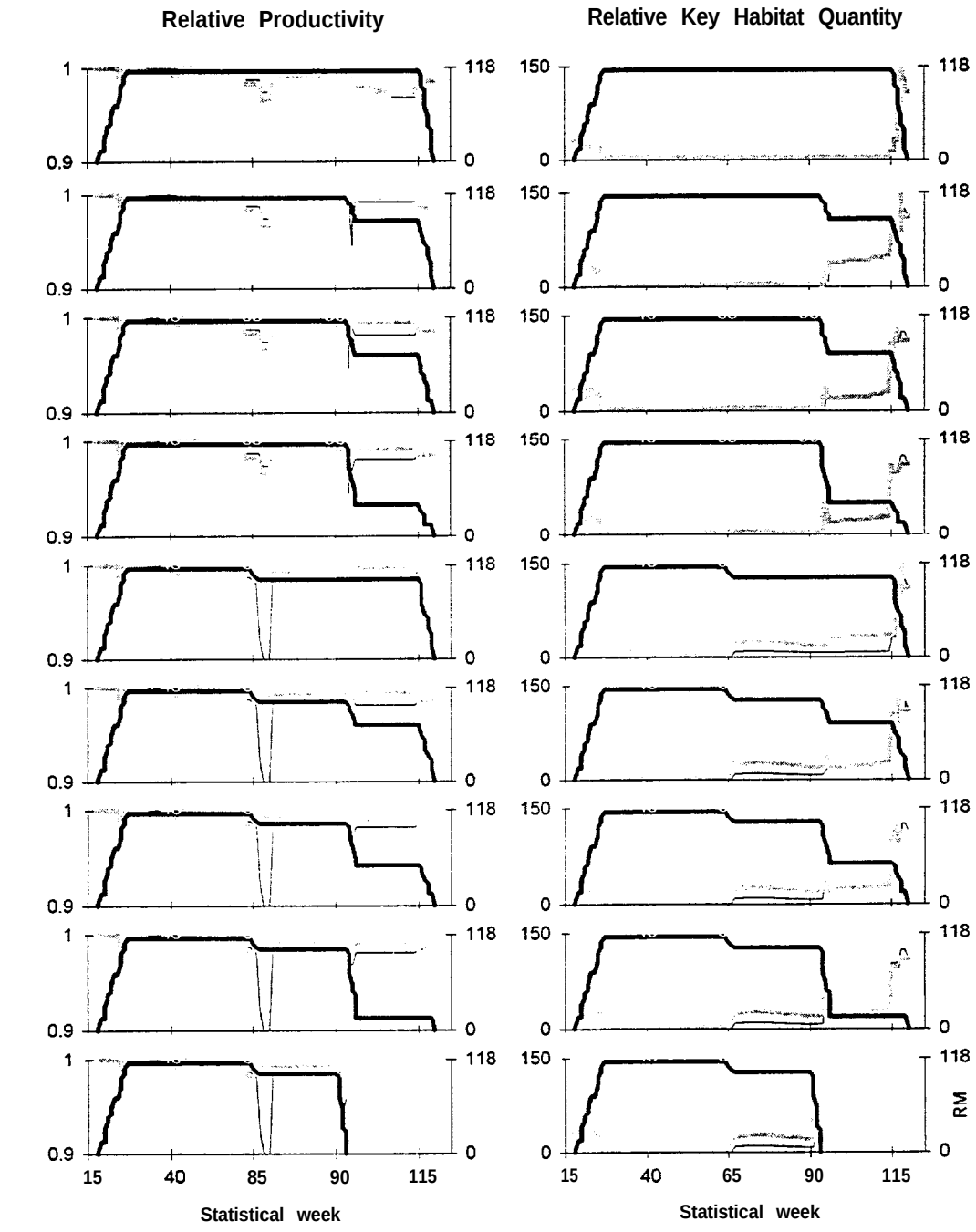


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
319	0.27
206	0.19
Traj. #2	
398	0.40
311	0.33
Traj. #3	
359	0.36
255	0.27
Traj. #4	
375	0.38
254	0.27
Traj. #5	
367	0.50
234	0.22
Traj. #6	
367	0.50
230	0.23
Traj. #7	
347	0.48
227	0.22
Traj. #8	
344	0.47
227	0.22
Traj. #9	
620	0.91
481	0.49

Trajectory
Template
Patient

Spawning reach: Bear Cr.

Little Bear Cr - headwaters (RM 109.3 - 118.3 from Snake R)

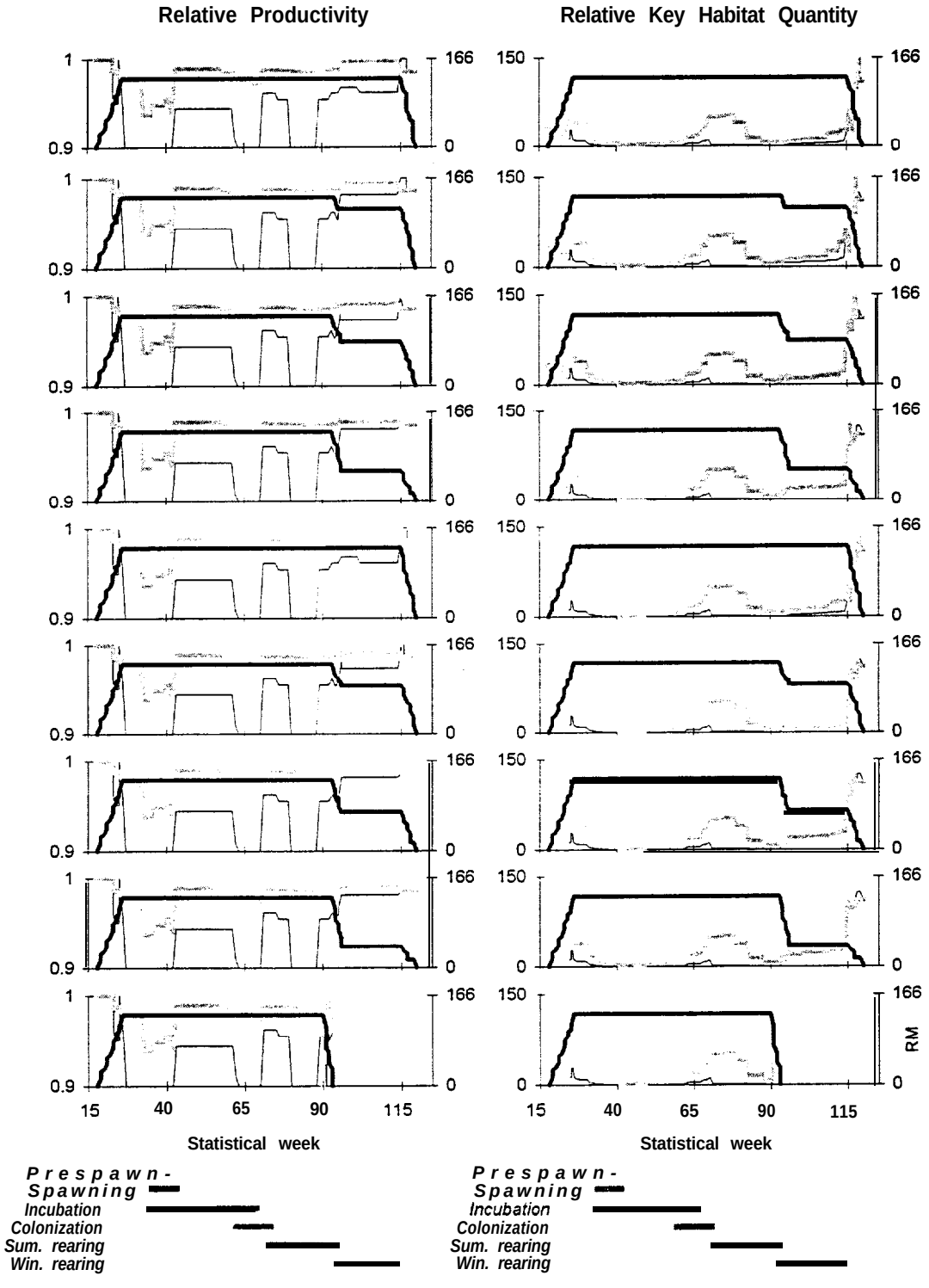


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
263	0.19
288	0.20
Traj. #2	
379	0.33
393	0.31
Traj. #3	
378	0.33
326	0.26
Traj. #4	
357	0.31
320	0.26
Traj. #5	
456	0.54
256	0.24
Traj. #6	
427	0.50
235	0.23
Traj. #7	
386	0.46
231	0.23
Traj. #8	
404	0.48
228	0.23
Traj. #9	
722	0.92
480	0.51

Trajectory
Template
Patient

Spawning reach: Catherine Cr.

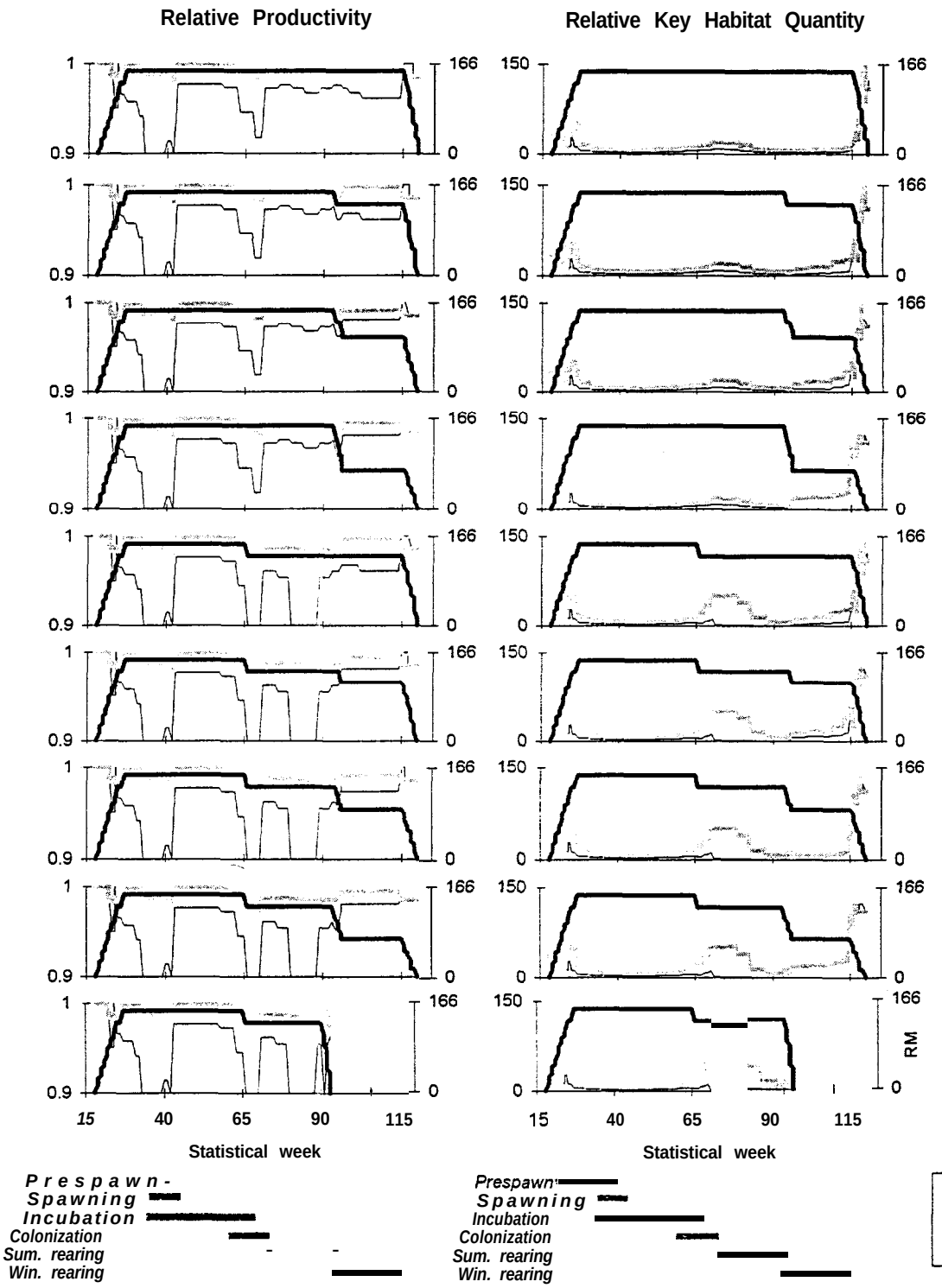
Mouth - 10th Street Bridge in Union (RM 114.5 - 146.0 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
154	0.59
0	0.00
Traj. #2	
145	0.57
0	0.00
Traj. #3	
138	0.54
0	0.00
Traj. #4	
132	0.53
0	0.00
Traj. #5	
154	0.59
0	0.00
Traj. #6	
138	0.51
0	0.00
Traj. #7	
146	0.59
0	0.00
Traj. #8	
138	0.56
0	0.00
Traj . #9	
253	1.16
0	0.00

Spawning reach: Catherine Cr.

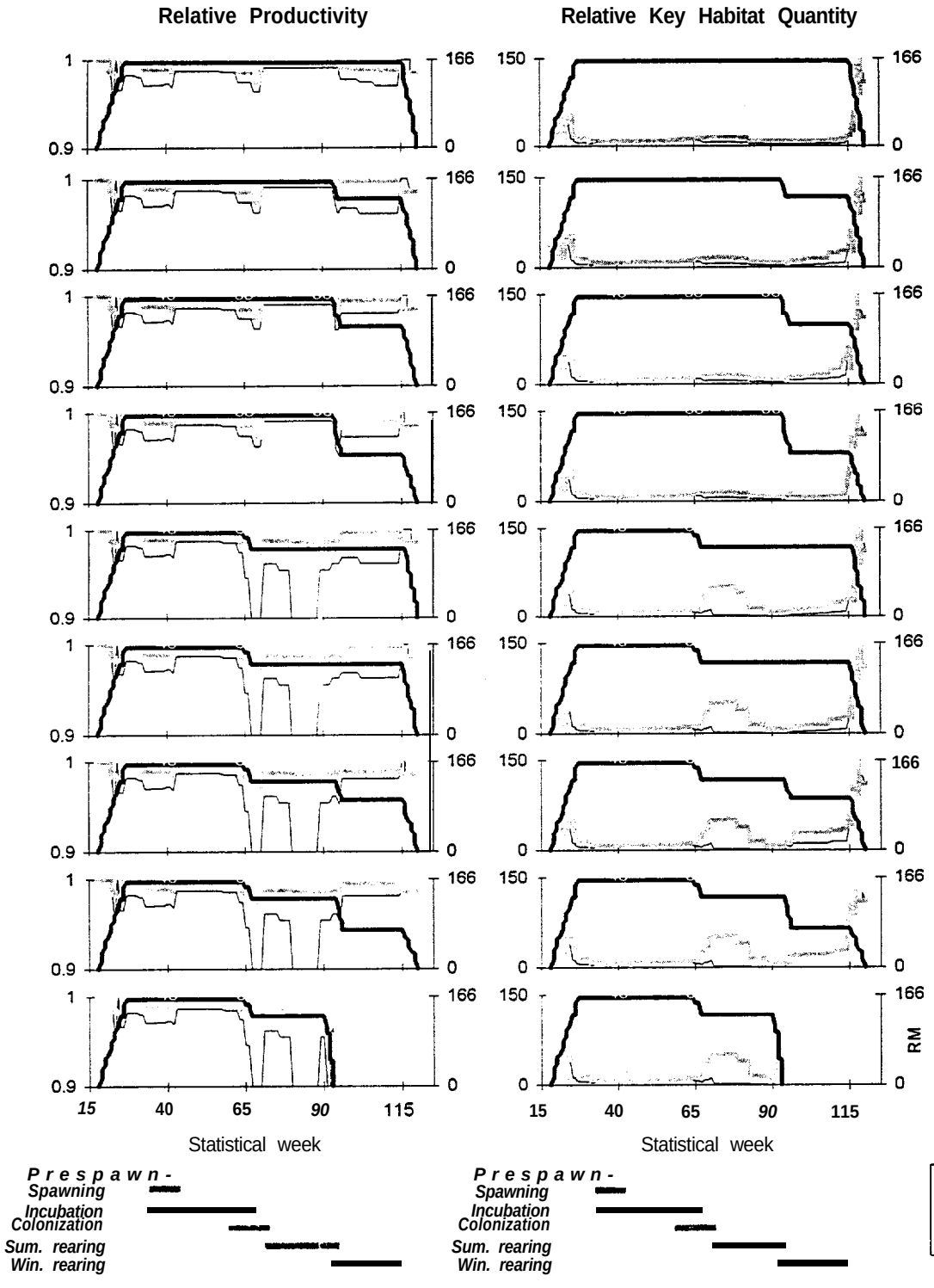
10th Street Bridge in Union - Little Catherine Cr (RM 146.0 - 157.5 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
406	0.69
14	0.02
Traj. #2	
419	0.79
13	0.02
Traj. #3	
378	0.74
18	0.03
Traj. #4	
396	0.79
17	0.03
Traj. #5	
"	I I
Traj. #6	
319	0.75
3	0.01
Traj. #7	
302	0.65
2	0.00
Traj . #8	
318	0.78
3	0.00
Traj. #9	
557	1.61
5	0.01

Spawning reach: Catherine Cr.

Little Catherine Cr - forks (RM 157.5 - 164.4 from Snake R)

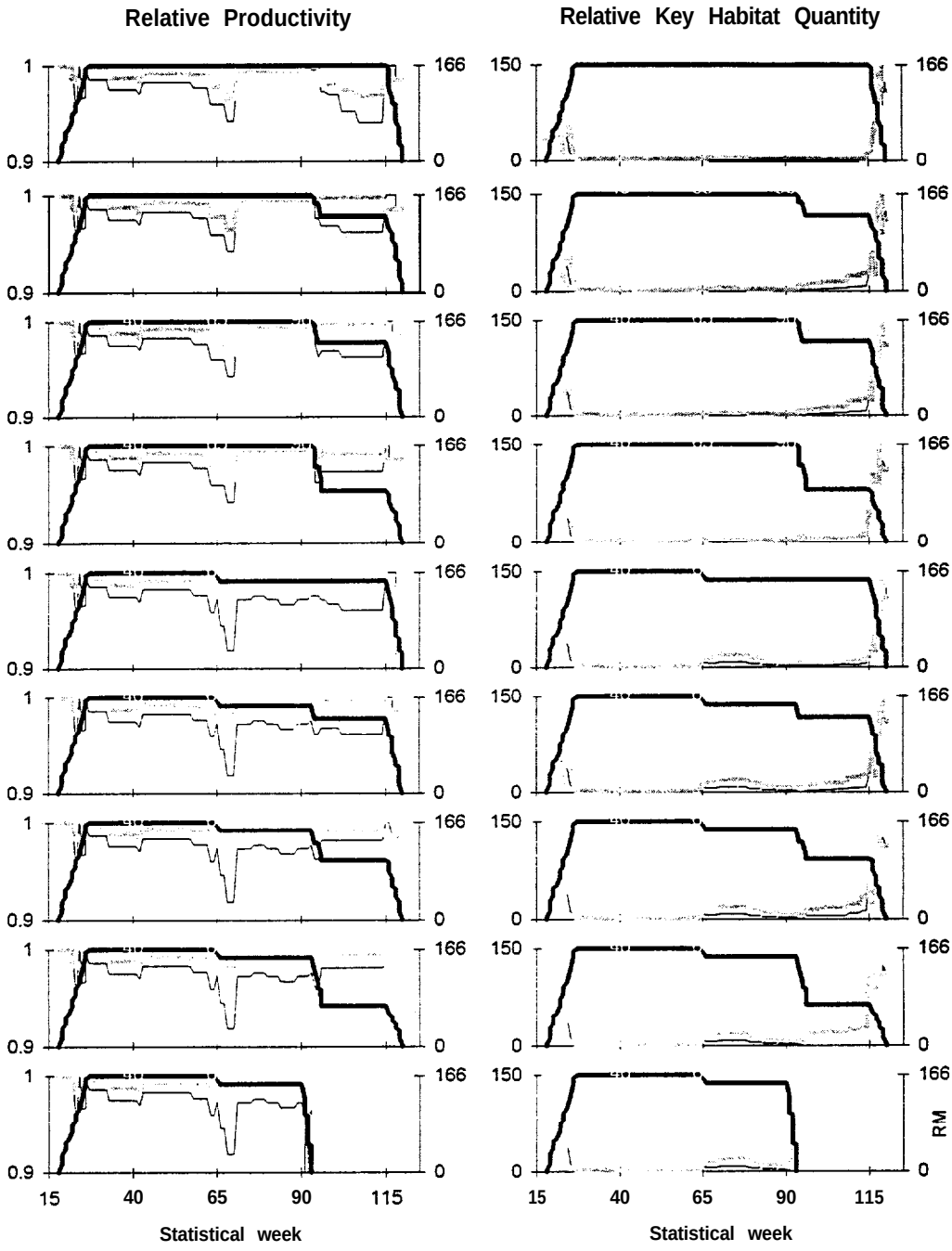


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
354	0.63
136	0.15
Traj. #2	
411	0.78
108	0.11
Traj. #3	
388	0.76
147	0.16
Traj. #4	
367	0.66
124	0.15
Traj. #5	
328	0.74
9	0.01
Traj. #6	
328	0.75
9	0.01
Traj. #7	
280	0.69
12	0.02
Traj. #8	
311	0.75
12	0.02
Traj. #9	
543	1.55
21	0.03

Trajectory
Template
Patient

Spawning reach: Catherine Cr.

South Fork Catherine Cr (RM 164.4 - 166.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
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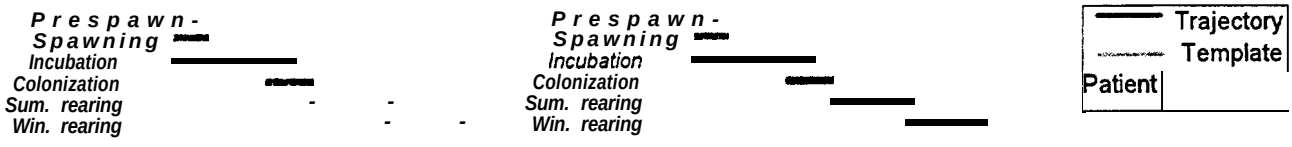
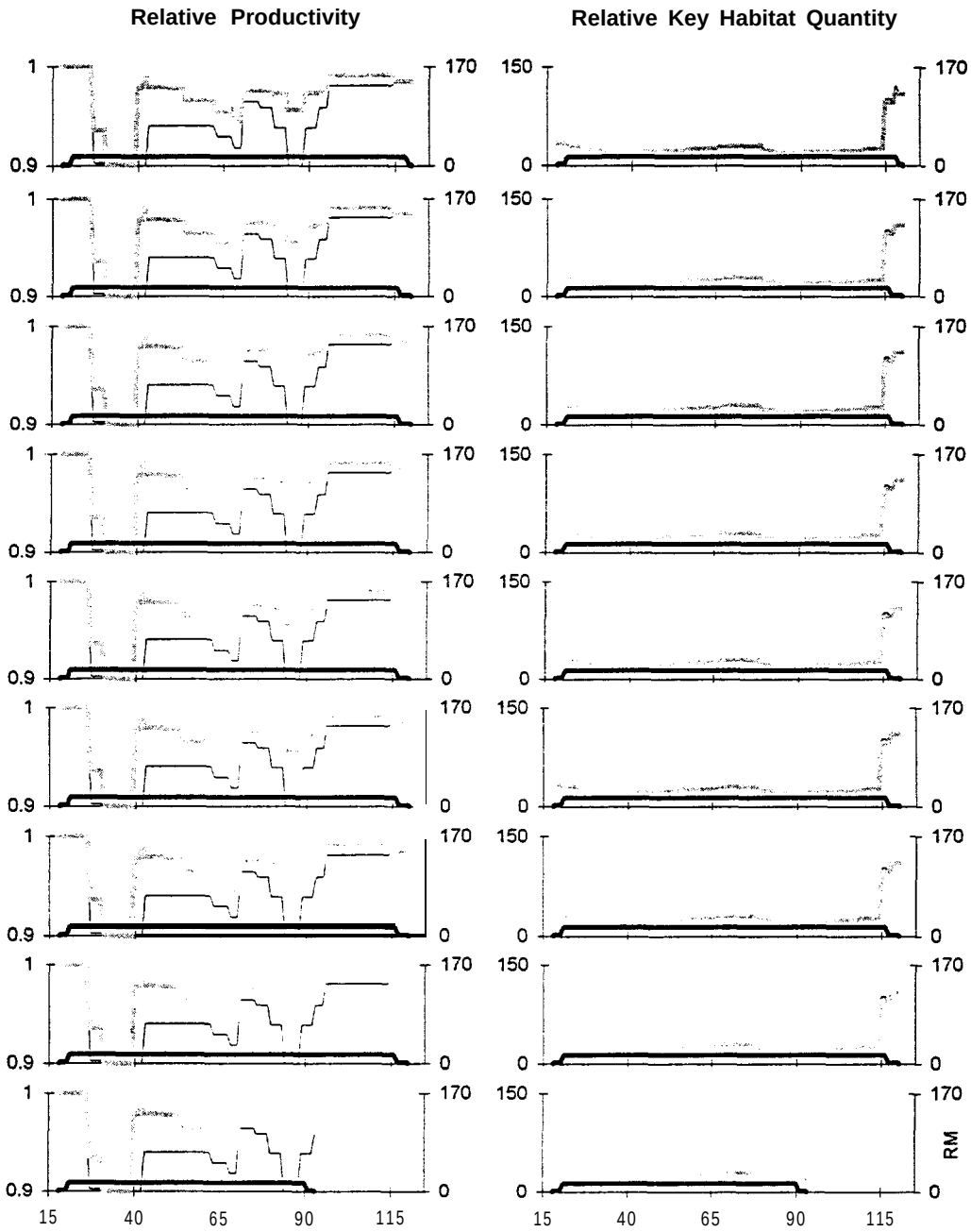
85	0.07
Traj. #2	
347	0.25
102	0.09
Traj. #3	
345	0.25
99	0.08
Traj. #4	
310	0.22
117	0.09
Traj. #5	
347	0.32
54	0.05
Traj. #6	
358	0.35
52	0.05
Traj. #7	
322	0.32
72	0.07
Traj . #8	
338	0.34
69	0.07
Traj. #9	
577	0.62
136	0.15



Spawning reach: Grande Ronde R.

Joseph Cr - Buford Cr (RM 3.7- 26.2 from Snake R)

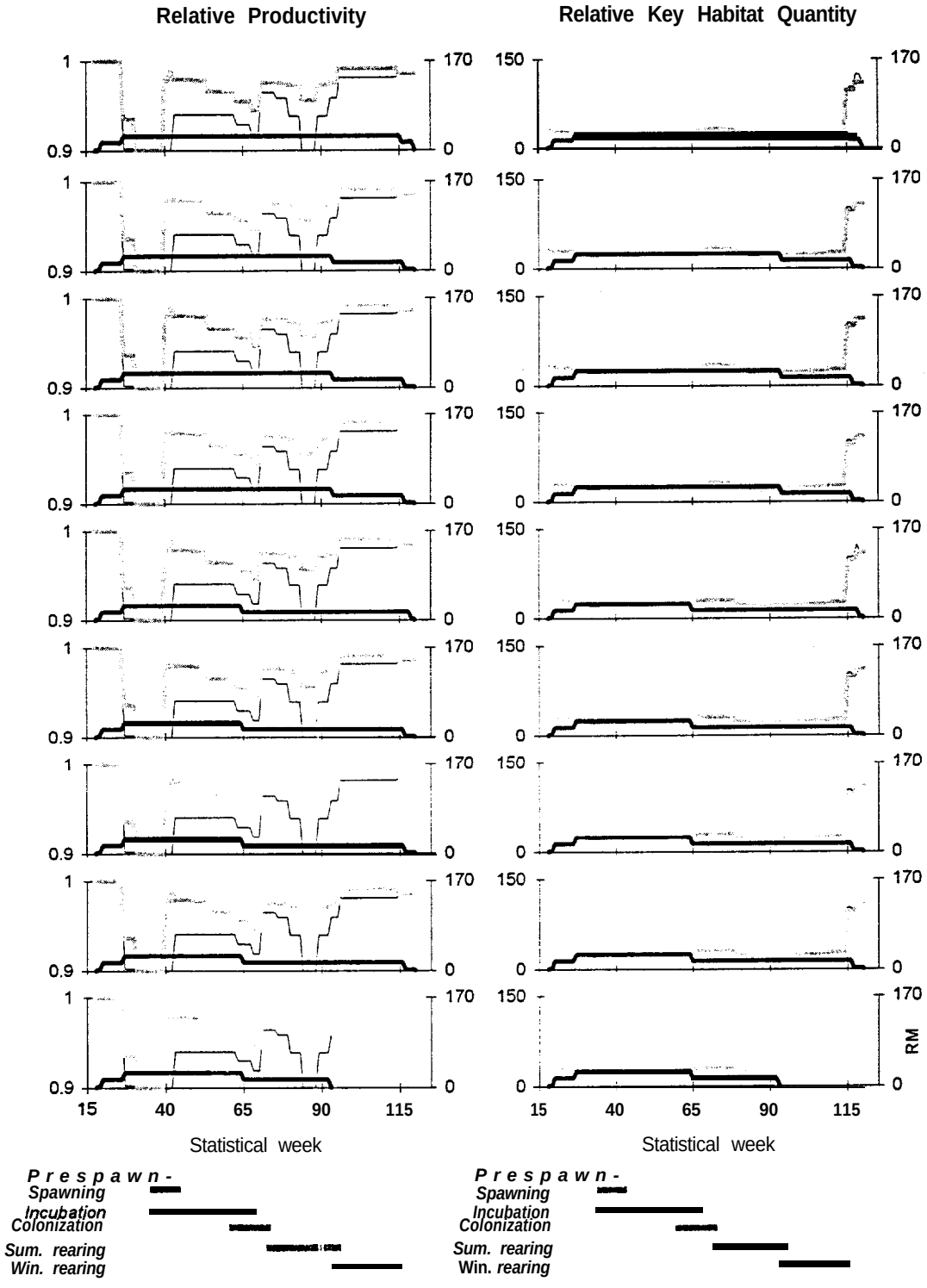


Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	1	0.00
	0	0.00
Traj. #2	1	0.00
	0	0.00
Traj. #3	1	0.00
	0	0.00
Traj. #4	1	0.00
	0	0.00
Traj. #5	1	0.00
	0	0.00
Traj. #6	1	0.00
	0	0.00
Traj. #7	1	0.00
	0	0.00
Traj. #8	1	0.00
	0	0.00
Traj. #9	2	0.01
	0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Buford Cr - Bear Cr (RM 26.2 - 28.2 from Snake R)

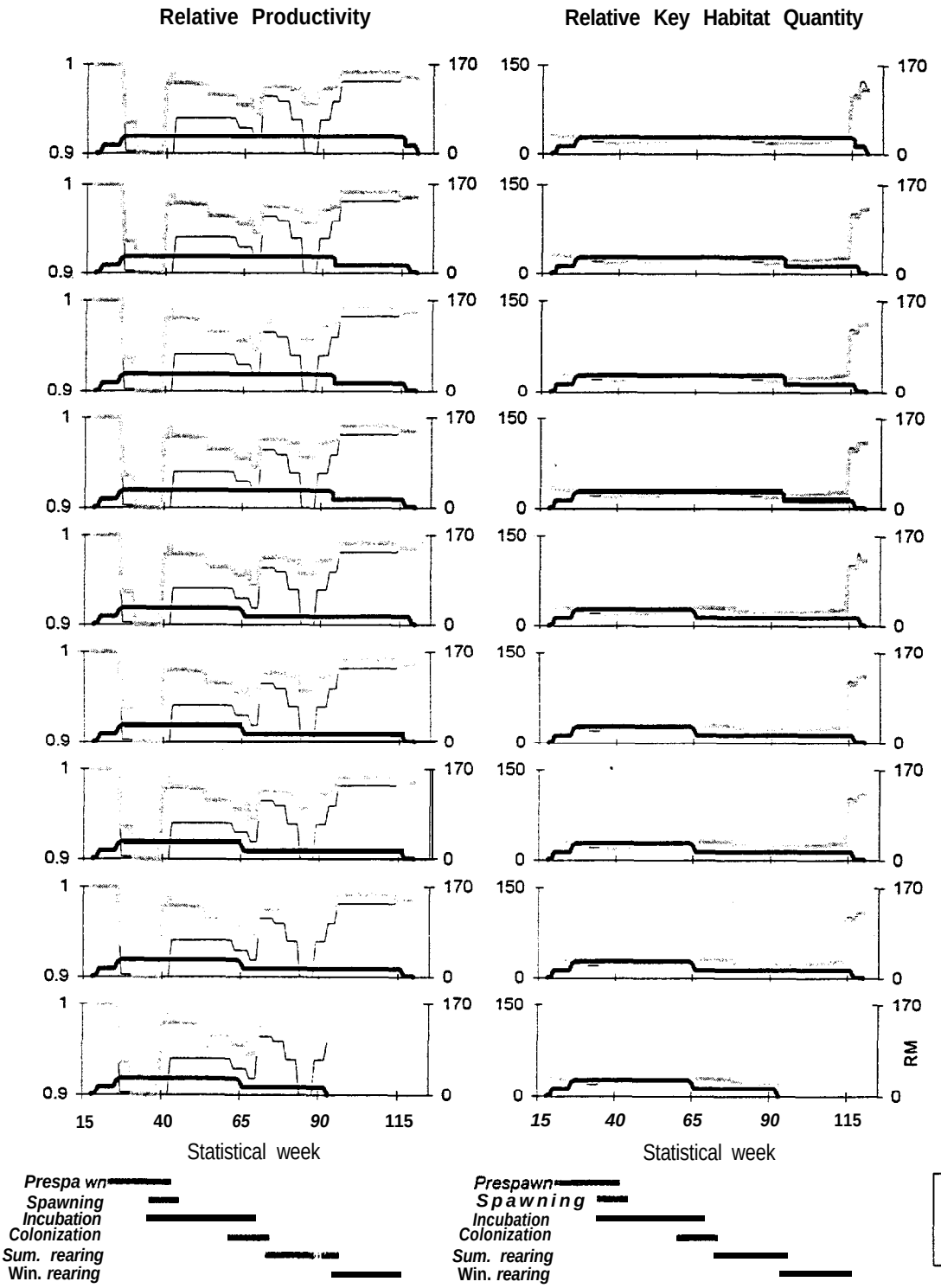


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
1	0.01
0	0.00
Traj. #2	
1	0.01
0	0.00
Traj. #3	
1	0.01
0	0.00
Traj. #4	
1	0.01
0	0.00
Traj. #5	
1	0.01
0	0.00
Traj. #6	
1	0.01
0	0.00
Traj. #7	
1	0.01
0	0.00
Traj. #8	
1	0.01
0	0.00
Traj. #9	
2	0.01
0	0.00

Trajectory
Template Patient

Spawning reach: Grande Ronde R.

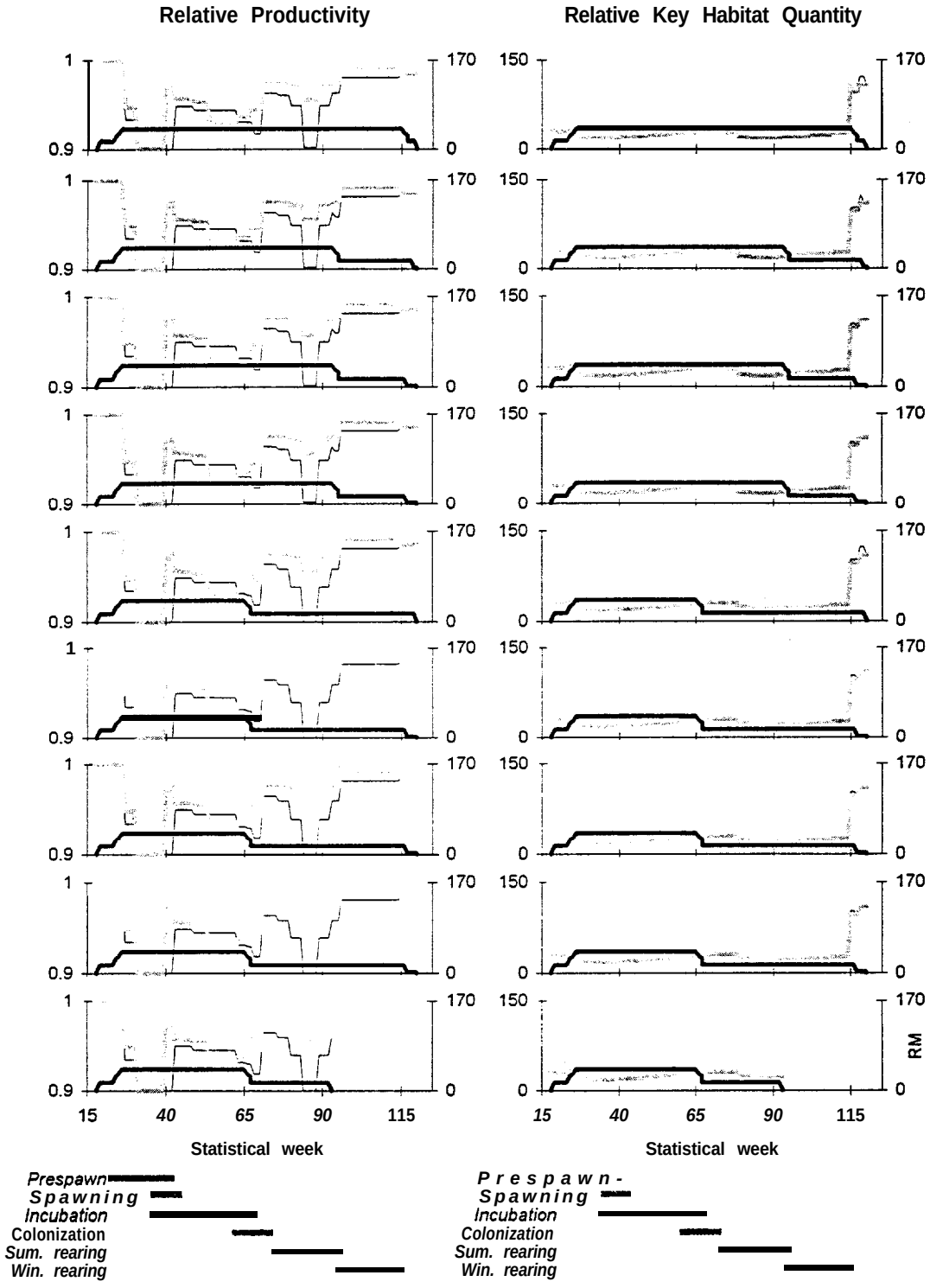
Bear Cr - Menatchee Cr (RM 28.2 - 34.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
1	0.01
0	0.00
Traj. #2	
1	0.01
0	0.00
Traj. #3	
1	0.01
0	0.00
Traj. #4	
1	0.01
0	0.00
Traj. #5	
1	0.01
0	0.00
Traj. #6	
1	0.01
0	0.00
Traj. #7	
1	0.01
0	0.00
Traj. #8	
1	0.01
0	0.00
Traj. #9	
2	0.01
0	0.00

Spawning reach: Grande Ronde R.

Menatchee Cr - Wenaha R (RM 34.8 - 45.1 from Snake R)

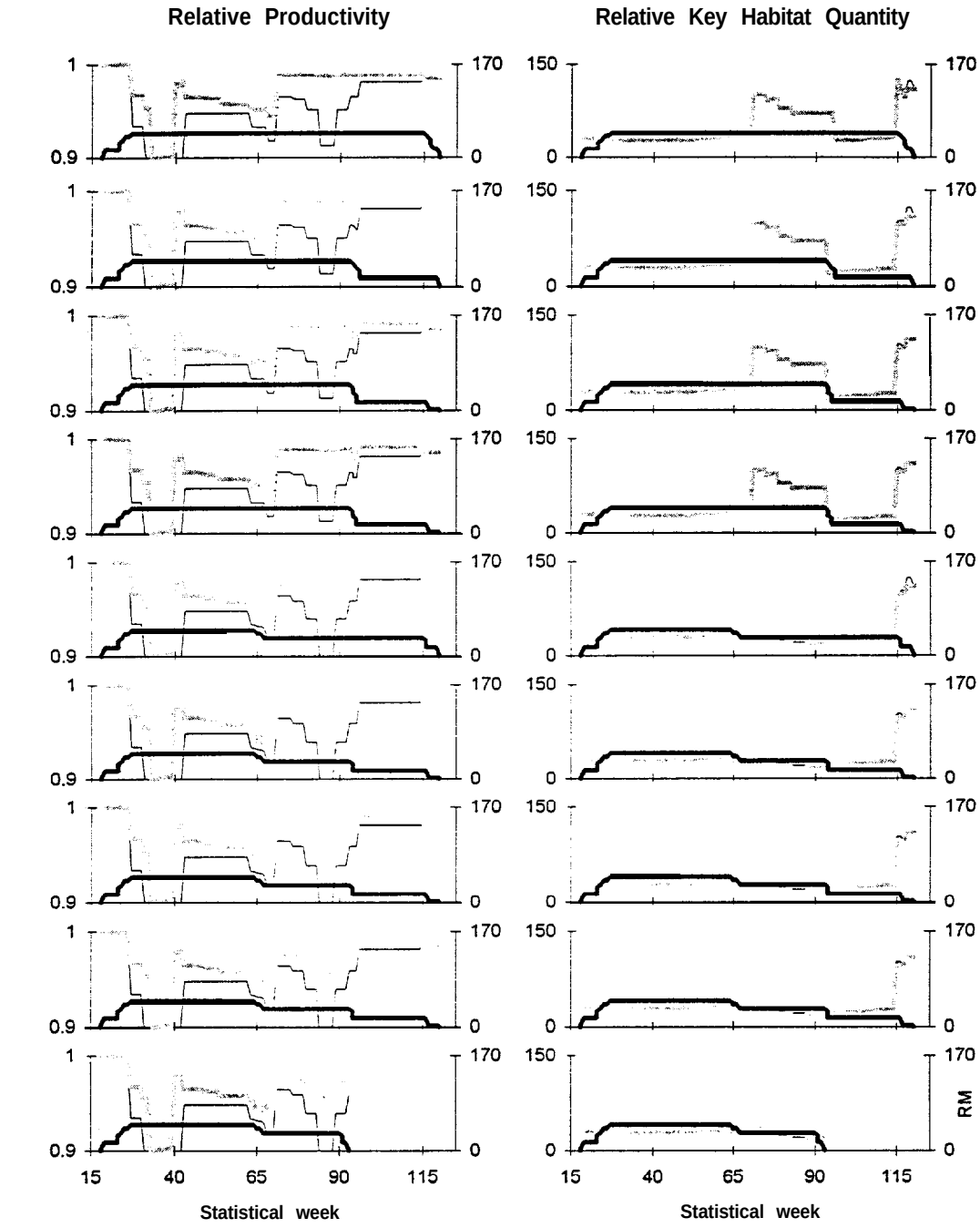


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
5	0.02
0	0.00
Traj. #2	
5	0.02
0	0.00
Traj. #3	
5	0.02
0	0.00
Traj. #4	
5	0.02
0	0.00
Traj. #5	
5	0.02
0	0.00
Traj. #6	
5	0.02
0	0.00
Traj. #7	
5	0.02
0	0.00
Traj. #8	
5	0.02
0	0.00
Traj. #9	
9	0.04
0	0.00

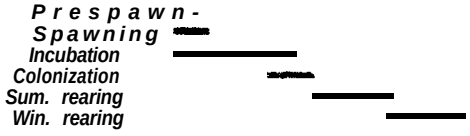
Trajectory
--- Template
Patient

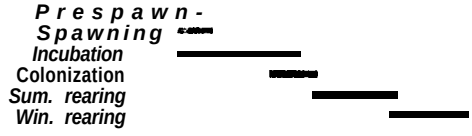
Spawning reach: Grande Ronde R.

Wenaha R - Courtney Cr (RM 45.1 - 46.2 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
40	0.22
0	0.00
Traj. #2	
40	0.22
0	0.00
Traj. #3	
40	0.22
0	0.00
Traj. #4	
40	0.22
0	0.00
Traj. #5	
25	0.14
0	0.00
Traj. #6	
25	0.14
0	0.00
Traj. #7	
25	0.14
0	0.00
Traj. #8	
25	0.14
0	0.00
Traj. #9	
48	0.26
0	0.00

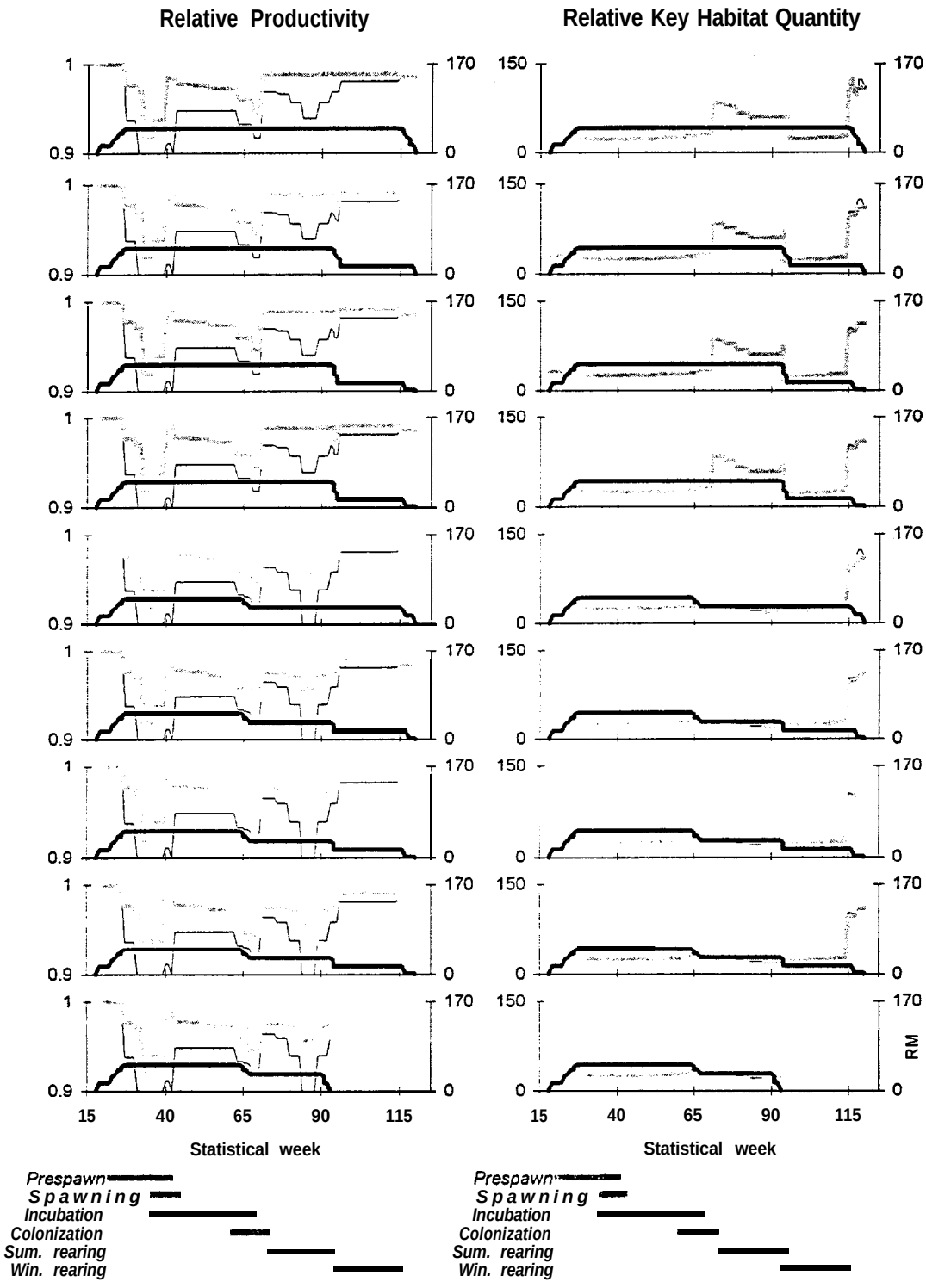




Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

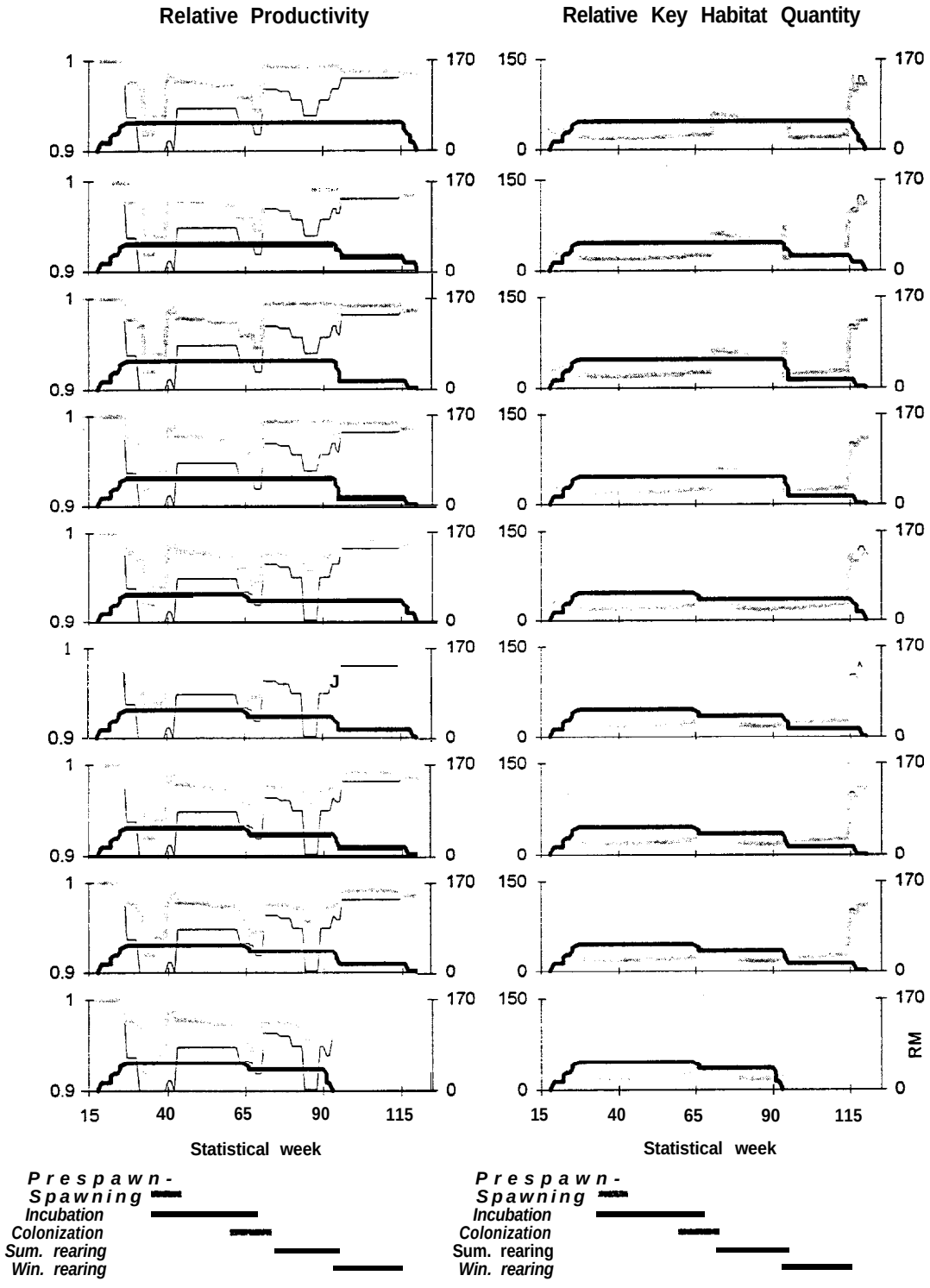
Courtney Cr - Mud Cr (RM 46.2 - 51.4 from Snake R)



Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
94	0.46
0	0.00
Traj. #2	
96	0.46
0	0.00
Traj. #3	
96	0.46
0	0.00
Traj. #4	
96	0.46
0	0.00
Traj. #5	
59	0.28
0	0.00
Traj. #6	
59	0.28
0	0.00
Traj. #7	
59	0.28
0	0.00
Traj. #8	
59	0.28
0	0.00
Traj. #9	
112	0.55
0	0.00

Spawning reach: Grande Ronde R.

Mud Cr - Wallupa/Wildcat Cr (RM 51.4 - 52.8 from Snake R)

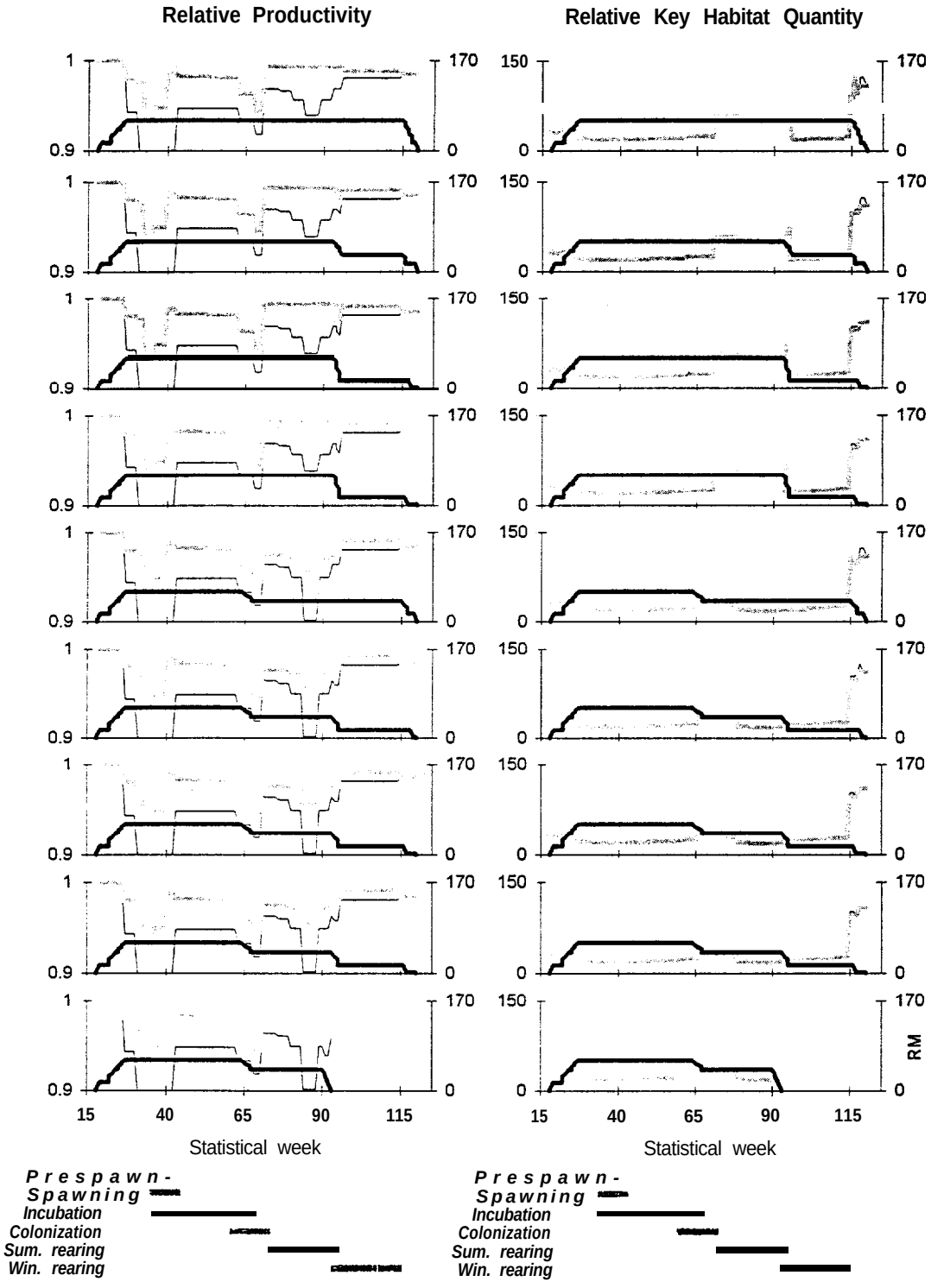


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
106	0.44
0	0.00
Traj. #2	
108	0.45
0	0.00
Traj. #3	
108	0.45
0	0.00
Traj. #4	
108	0.45
0	0.00
Traj. #5	
59	0.26
0	0.00
Traj. #6	
59	0.26
0	0.00
Traj. #7	
59	0.26
0	0.00
Traj. #8	
59	0.26
0	0.00
Traj. #9	
113	0.50
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

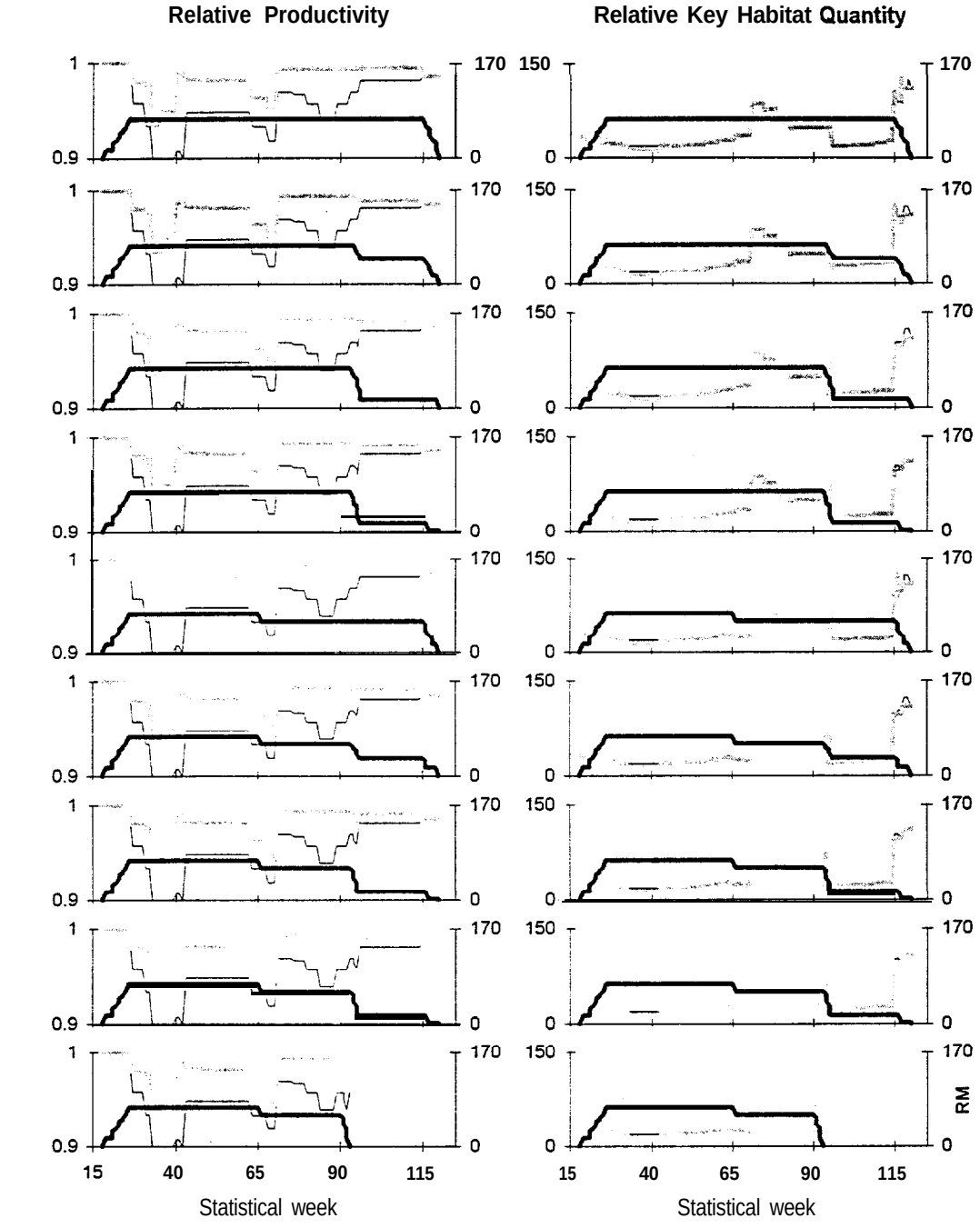
Wallupa/Wildcat Cr - Grossman Cr (RM 52.8 - 61.1 from Snake R)



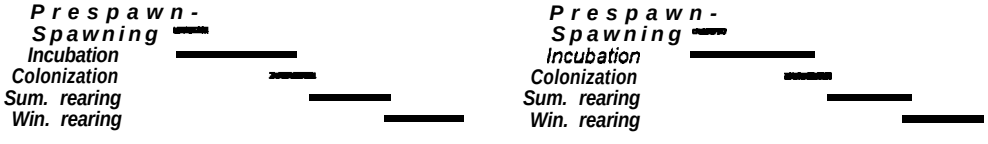
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
142	**0.57**
1	**0.00**
Traj. #2	
145	0.58
1	0.00
Traj. #3	
144	0.58
1	0.00
Traj. #4	
144	0.58
1	0.00
Traj. #5	
80	0.33
0	0.00
Traj. #6	
80	0.33
0	0.00
Traj. #7	
80	0.33
0	0.00
Traj. #8	
80	0.33
0	0.00
Traj. #9	
153	0.66
I	0.00

Spawning reach: Grande Ronde R.

Grossman Cr - Wallowa R (RM 61.1 - 80.0 from Snake R)



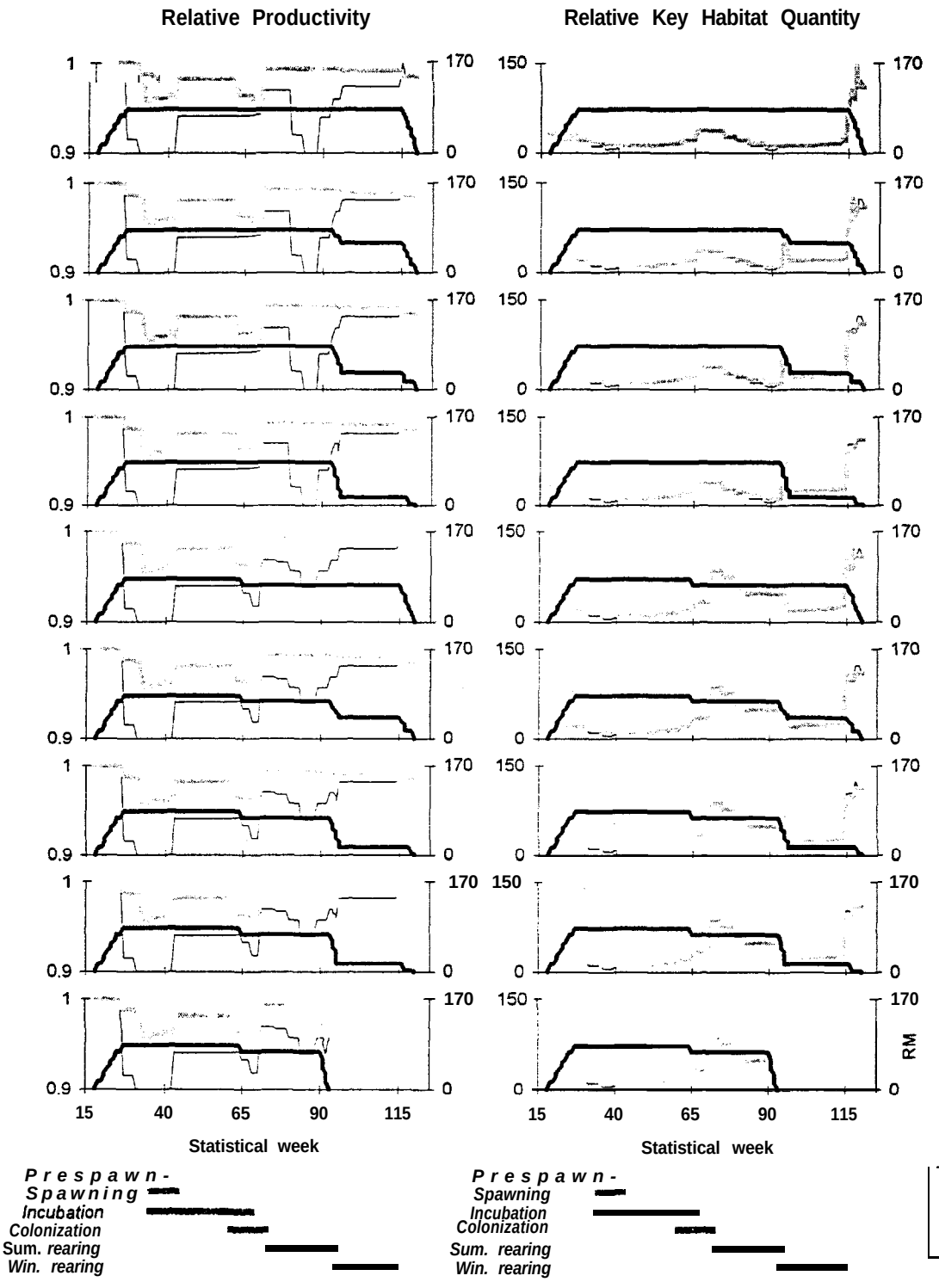
Template Patient	
Cumm. Prod.	Cumm. Cap.
Traj. #1	
157	0.65
6	0.03
Traj. #2	
142	0.60
6	0.03
Traj. #3	
146	0.61
6	0.03
Traj. #4	
145	0.61
6	0.03
Traj. #5	
142	0.57
6	0.03
Traj. #6	
145	0.59
6	0.03
Traj. #7	
144	0.59
6	0.03
Traj. #8	
144	0.59
6	0.03
Traj. #9	
258	1.12
14	0.07



Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

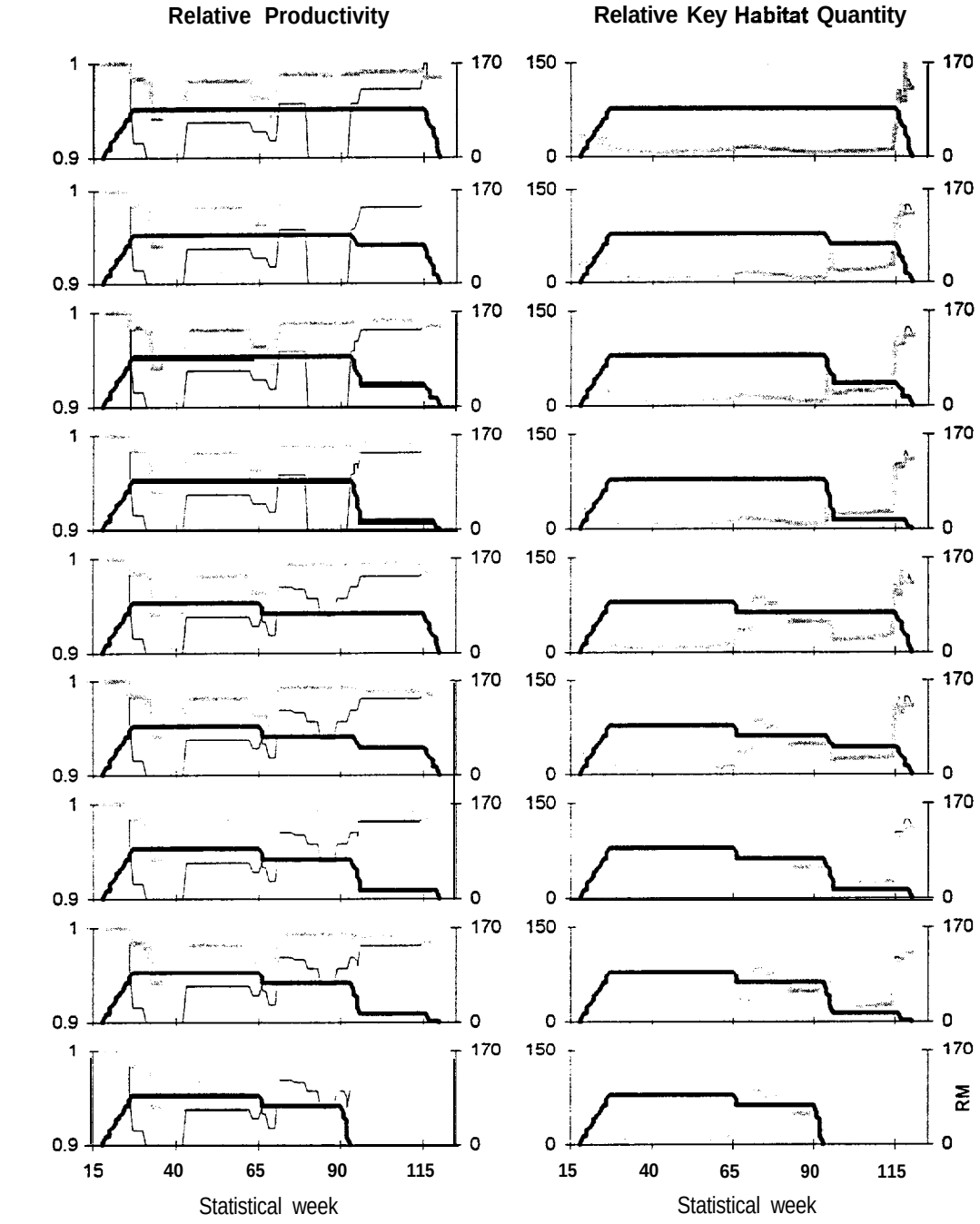
Wallowa R - Lookingglass Cr (RM 80.0 - 83.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
159	0.54
0	0.00
Traj. #2	
151	0.54
0	0.00
Traj. #3	
158	0.57
0	0.00
Traj. #4	
156	0.56
0	0.00
Traj. #5	
167	0.65
0	0.00
Traj. #6	
157	0.62
0	0.00
Traj. #7	
155	0.61
0	0.00
Traj. #8	
155	0.61
0	0.00
Traj. #9	
276	1.16
0	0.00

Spawning reach: Grande Ronde R.

Lookingglass Cr - Gordon Cr (RM 83.4 - 94.2 from Snake R)

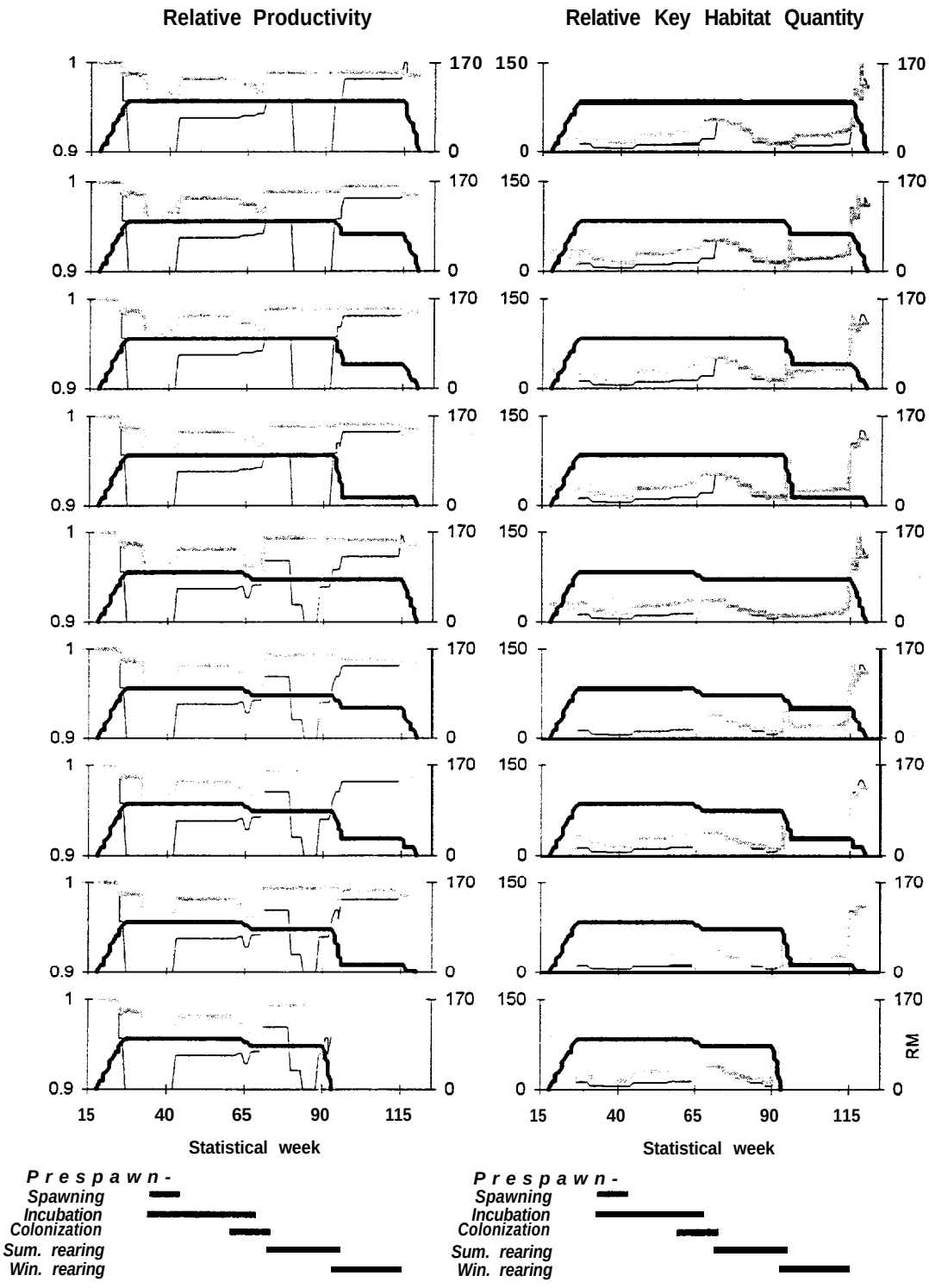


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
124	0.29
0	0.00
Traj. #2	
132	0.32
0	0.00
Traj. #3	
124	0.31
0	0.00
Traj. #4	
123	0.30
0	0.00
Traj. #5	
147	0.41
0	0.00
Traj. #6	
133	0.38
0	0.00
Traj. #7	
137	0.39
0	0.00
Traj. #8	
136	0.38
0	0.00
Traj. #9	
244	0.72
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Gordon Cr - Phillips Cr (RM 94.2 - 96.9 from Snake R)

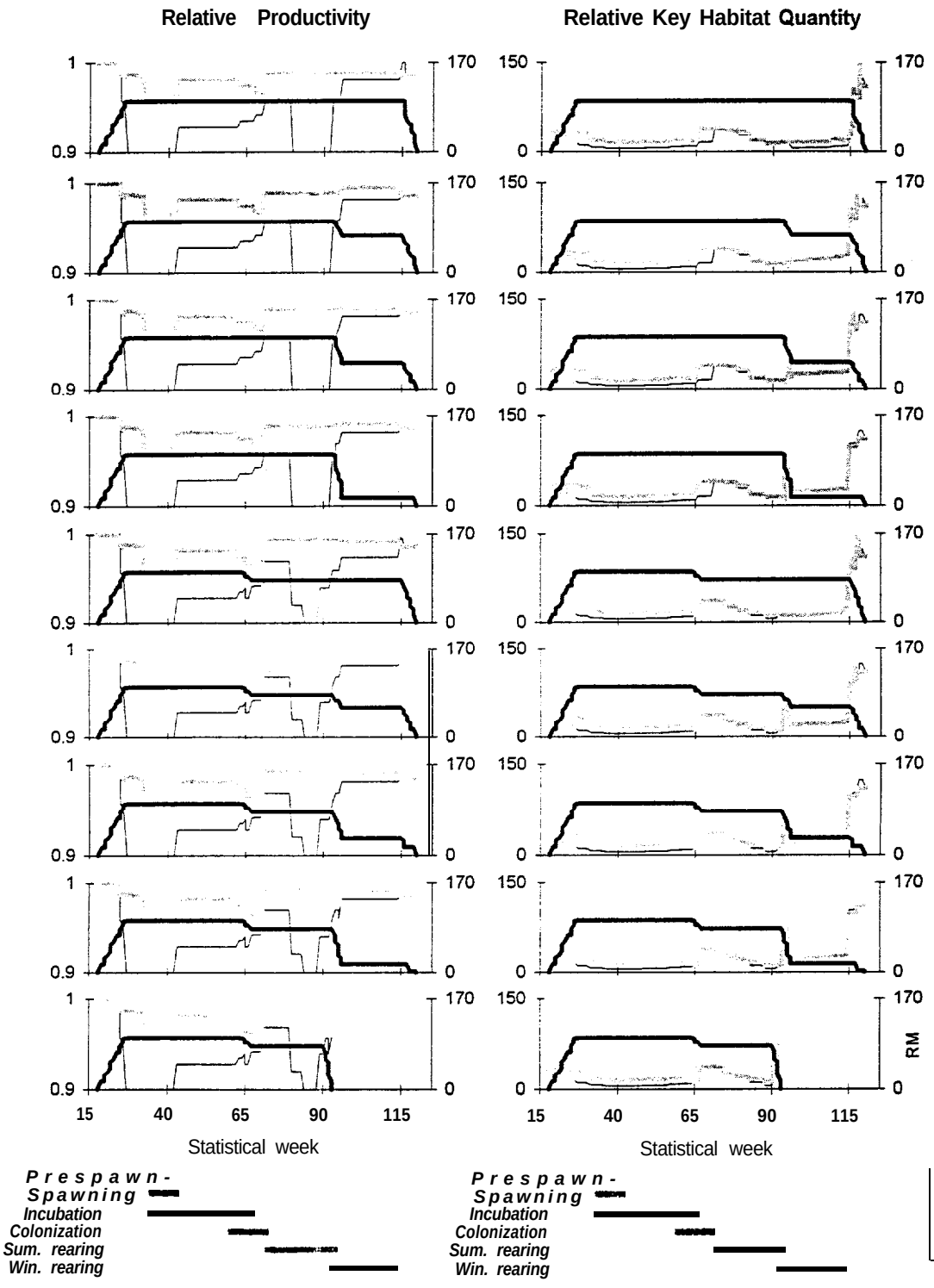


Template	
Patient	
Cum. Prod.	**Cum. Cap.**
Traj. #1	
149	0.59
0	0.00
Traj. #2	
165	0.65
0	0.00
Traj. #3	
150	0.61
0	0.00
Traj. #4	
156	0.62
0	0.00
Traj. #5	
160	0.58
0	0.00
Traj. #6	
152	0.58
0	0.00
Traj. #7	
158	0.61
0	0.00
Traj. #8	
157	0.60
0	0.00
Traj. #9	
281	1.19
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

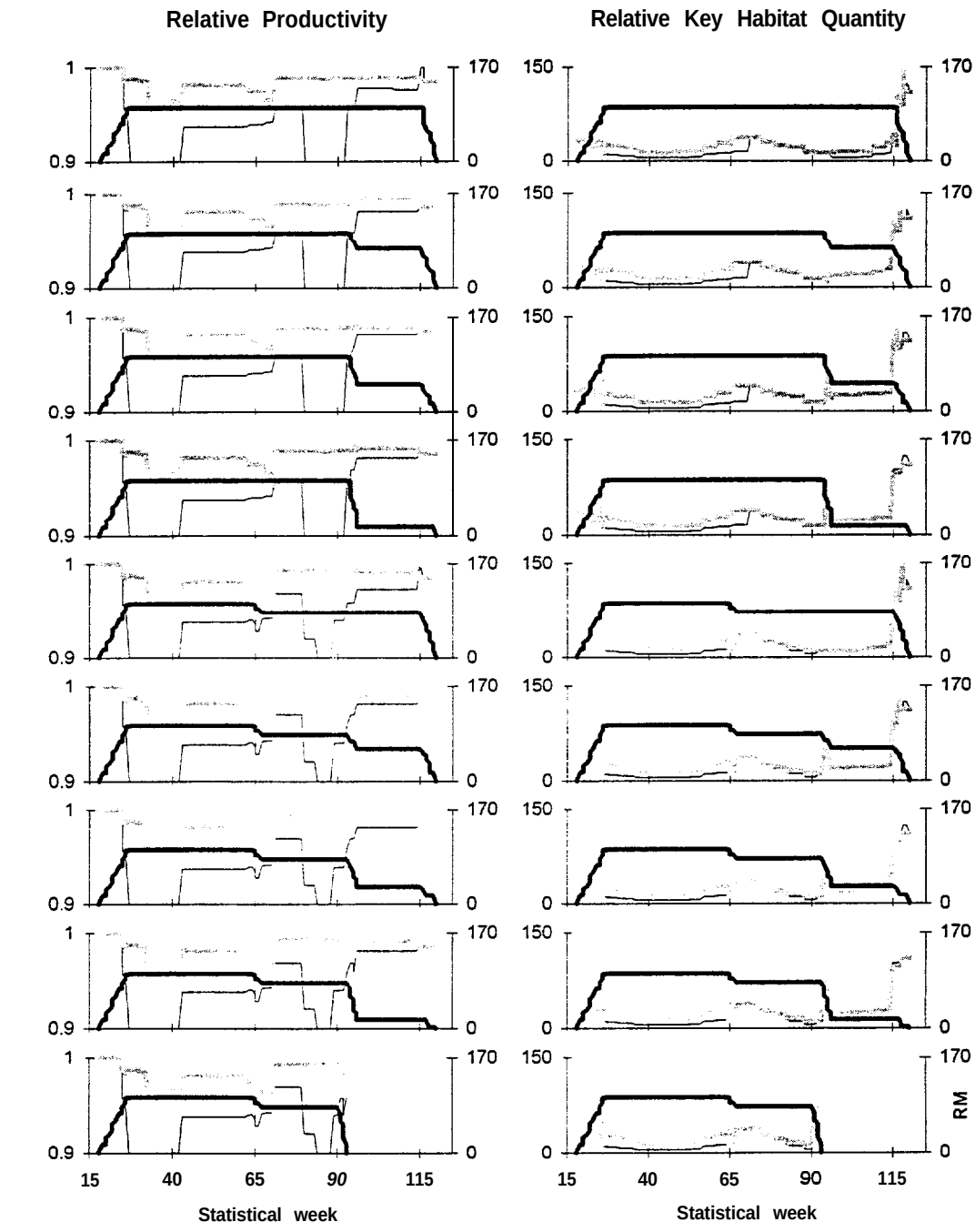
Phillips Cr - Clark Cr (RM 96.9 - 97.3 from Snake R)



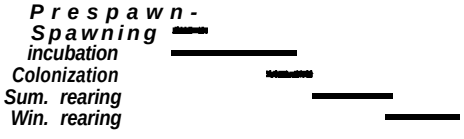
Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	149	0.58
	0	0.00
Traj. #2	166	0.66
	0	0.00
Traj. #3	150	0.61
	0	0.00
Traj. #4	157	0.64
	0	0.00
Traj. #5	160	0.60
	0	0.00
Traj. #6	152	0.60
	0	0.00
Traj. #7	159	0.63
	0	0.00
Traj. #8	157	0.62
	0	0.00
Traj. #9	282	1.23
	0	0.00

Spawning reach: Grande Ronde R.

Clark Cr - Indian Cr (RM 97.3 - 99.3 from Snake R)



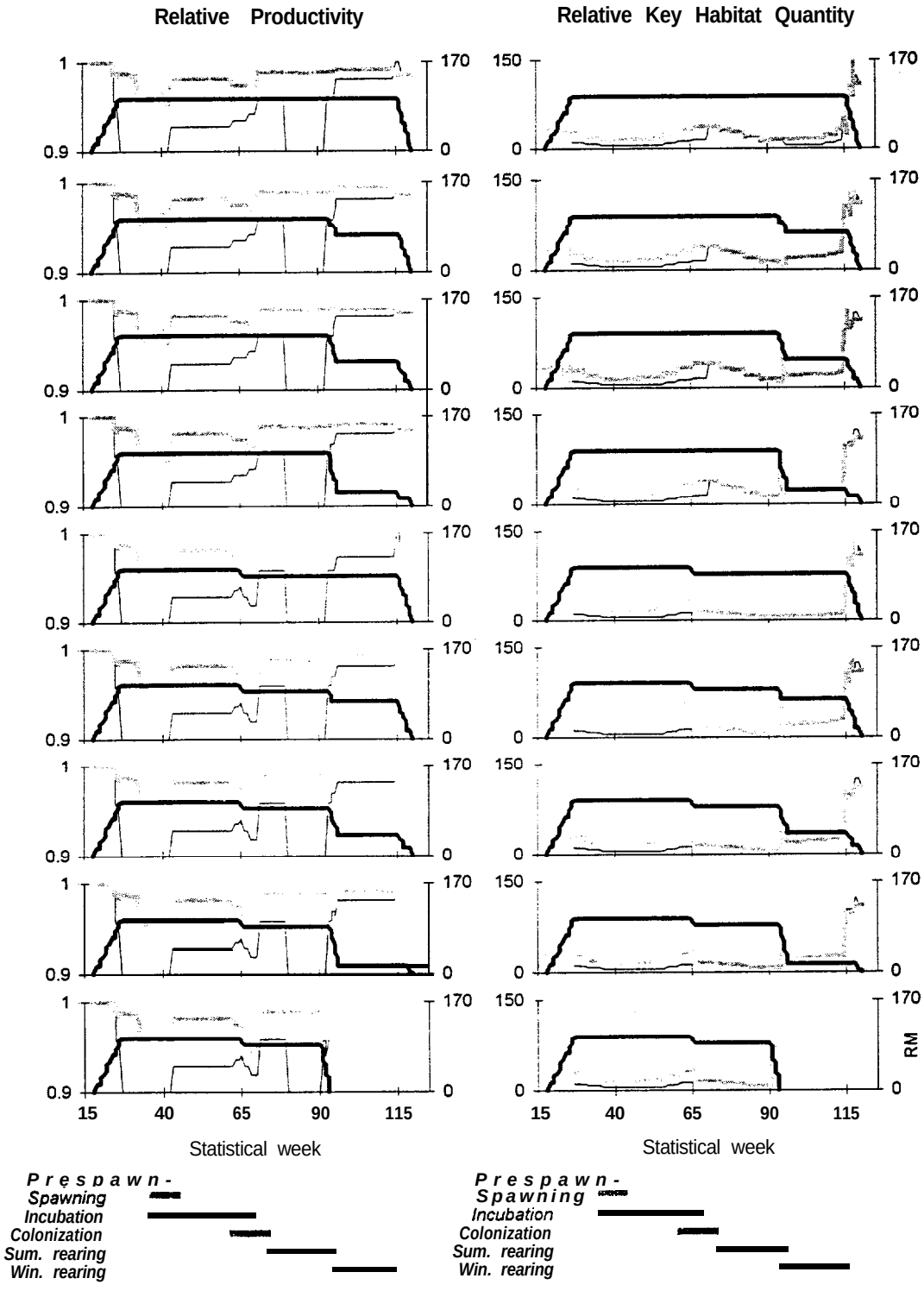
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
149	0.58
0	0.00
Traj. #2	
166	0.65
0	0.00
Traj. #3	
150	0.60
0	0.00
Traj. #4	
157	0.63
0	0.00
Traj. #5	
160	0.59
0	0.00
Traj. #6	
152	0.59
0	0.00
Traj. #7	
159	0.62
0	0.00
Traj. #8	
157	0.61
0	0.00
Traj. #9	
282	1.21
0	0.00



Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Indian Cr - Willow Cr (RM 99.3 - 103.5 from Snake R)

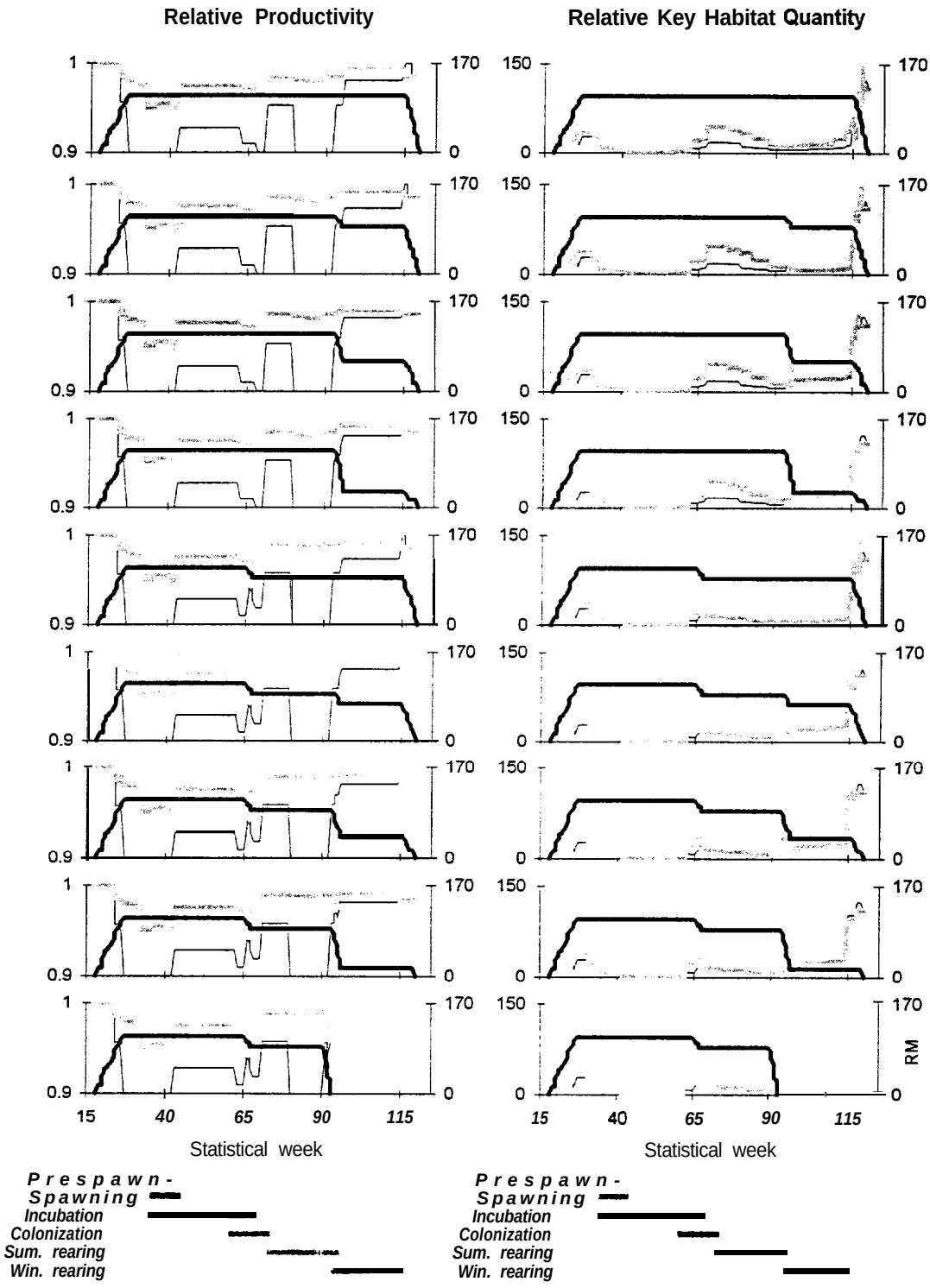


Template Patient	
Cum, Prod.	Cum. Cap.
Traj. #1	
157	0.61
0	0.00
Traj. #2	
165	0.65
0	0.00
Traj. #3	
149	0.59
0	0.00
Traj. #4	
157	0.63
0	0.00
Traj. #5	
144	0.44
0	0.00
Traj. #6	
153	0.53
0	0.00
Traj. #7	
144	0.50
0	0.00
Traj. #8	
143	0.49
0	0.00
Traj. #9	
259	0.98
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

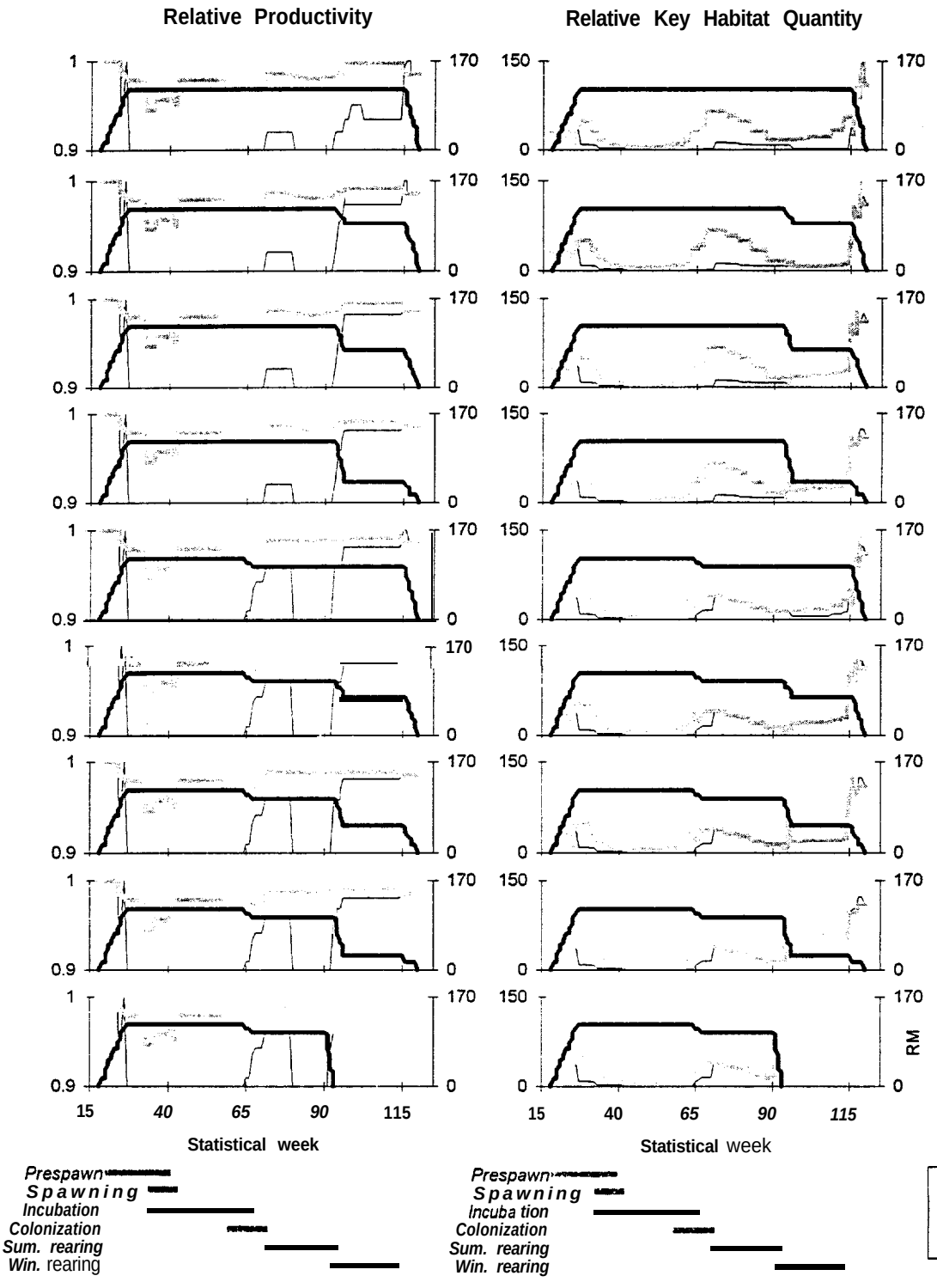
Willow Cr - downstream end of State Ditch (RM 103.5 - 114.5 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
111	0.45
0	0.00
Traj. #2	
106	0.40
0	0.00
Traj. #3	
101	0.42
0	0.00
Traj. #4	
106	0.44
0	0.00
Traj. #5	
113	0.37
0	0.00
Traj. #6	
119	0.42
0	0.00
Traj. #7	
113	0.41
0	0.00
Traj. #8	
112	0.40
0	0.00
Traj. #9	
203	0.79
0	0.00

Spawning reach: Grande Ronde R.

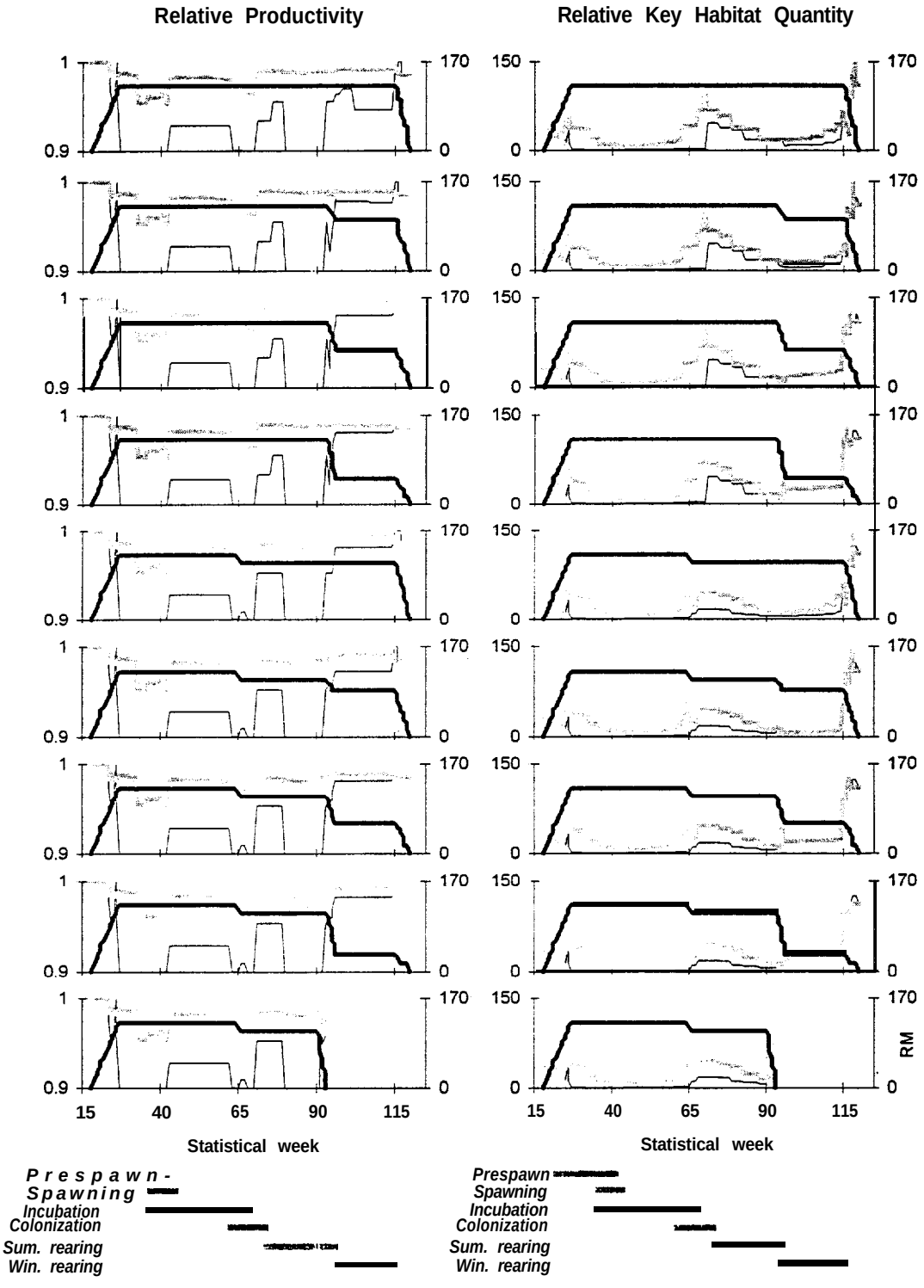
Downstream end of State Ditch - Upstream end of State Ditch (RM 114.5 - 118.9 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
124	0.65
0	0.00
Traj. #2	
112	0.53
0	0.00
Traj. #3	
118	0.61
0	0.00
Traj. #4	
112	0.59
0	0.00
Traj. #5	
125	0.61
0	0.00
Traj. #6	
131	0.64
0	0.00
Traj. #7	
119	0.59
0	0.00
Traj. #8	
125	0.63
0	0.00
Traj. #9	
225	1.24
0	0.00

Spawning reach: Grande Ronde R.

Upstream end of State Ditch - I-84 crossing below Devil's Slide (RM 118.9 - 128.4 from Snake R)

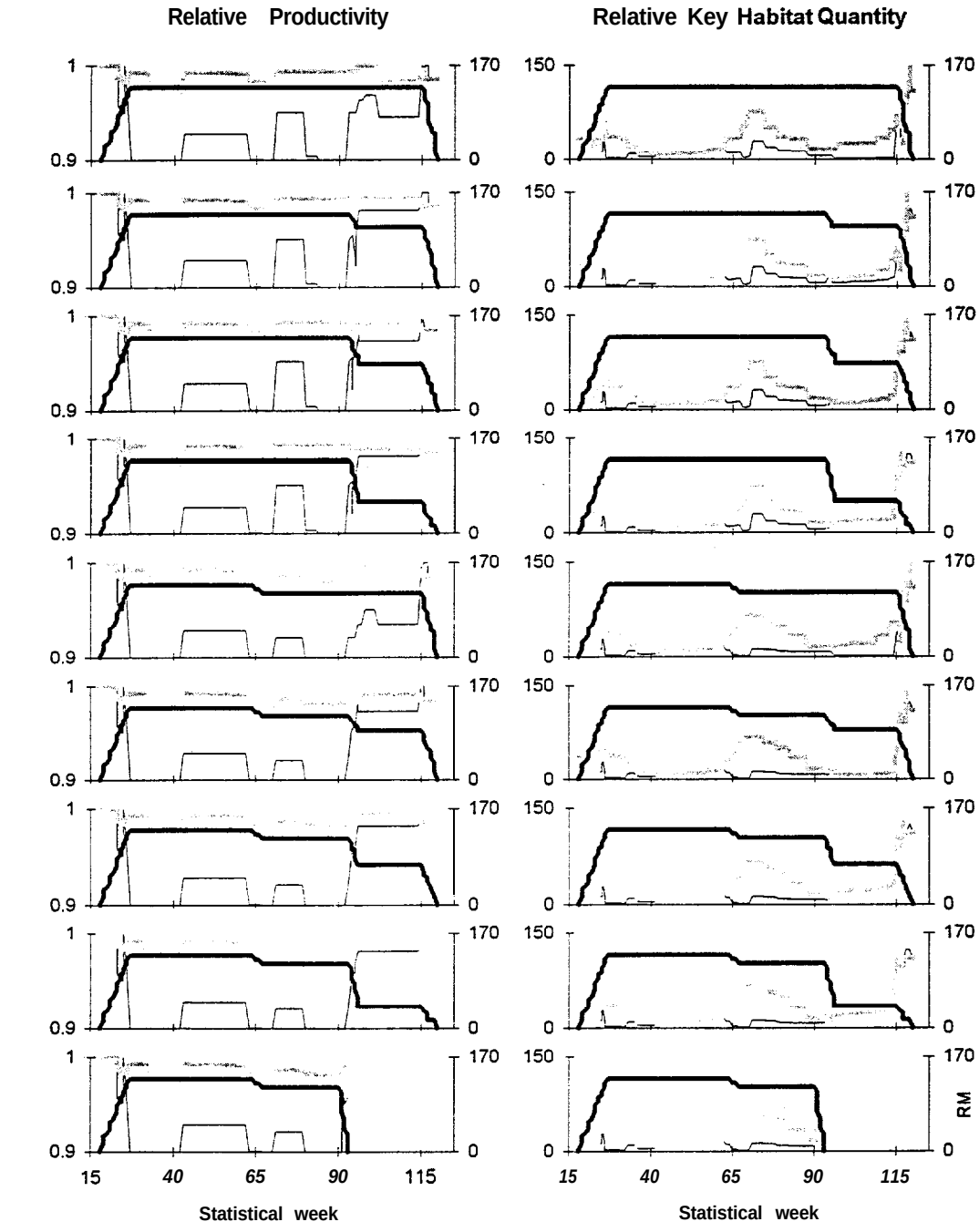


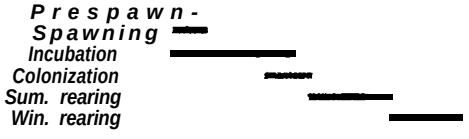
Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
155	0.73
0	0.00
Traj. #2	
144	0.66
0	0.00
Traj. #3	
160	0.75
0	0.00
Traj. #4	
145	0.69
0	0.00
Traj. #5	
141	0.63
0	0.00
Traj. #6	
135	0.56
0	0.00
Traj. #7	
129	0.59
0	0.00
Traj. #8	
134	0.62
0	0.00
Traj. #9	
247	1.27
0	0.00

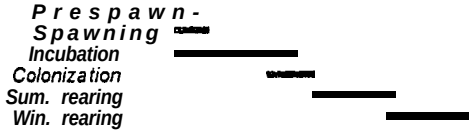
Trajectory
Template
Patient

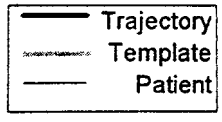
Spawning reach: Grande Ronde R.

I-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 - 133.4 from Snake R)





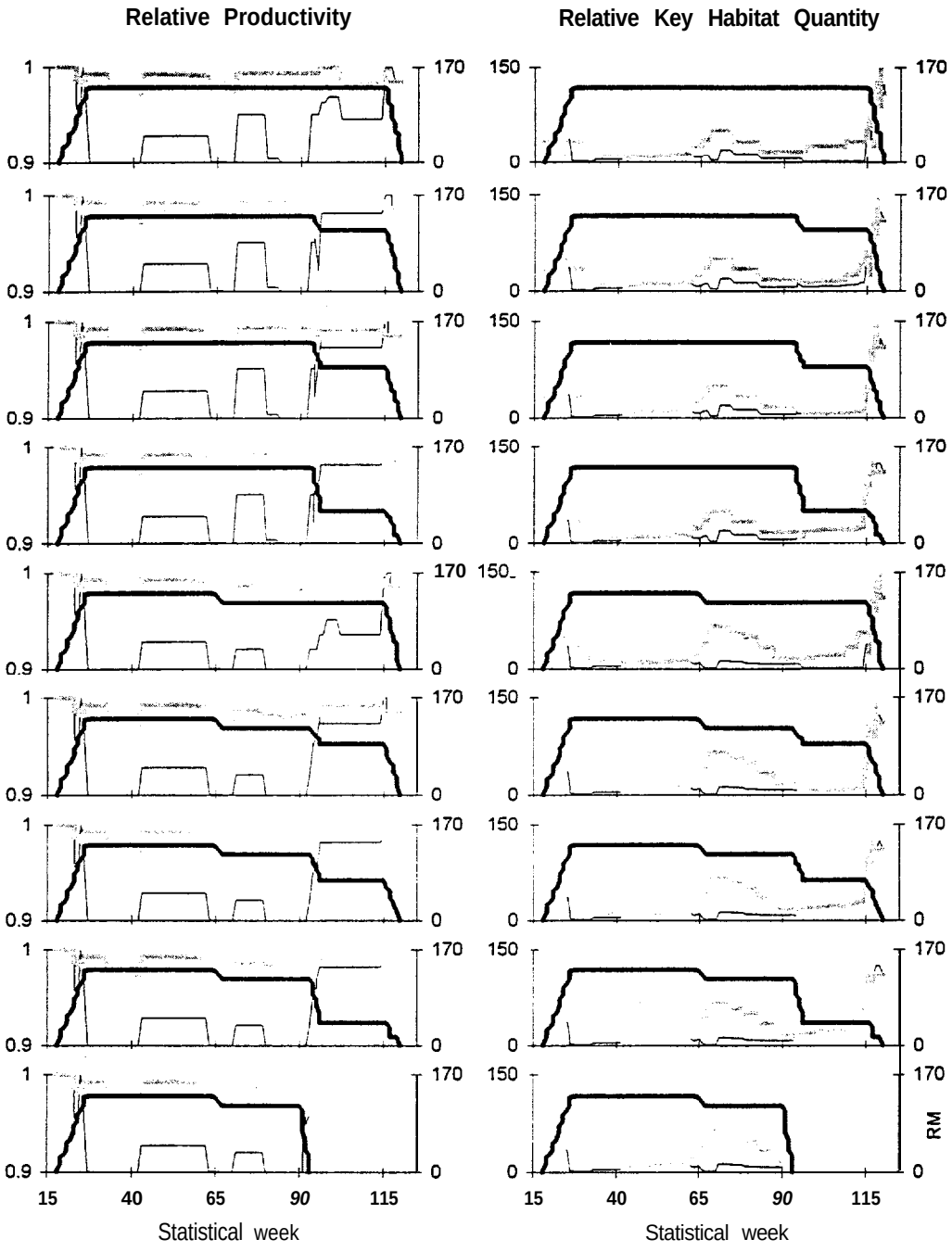




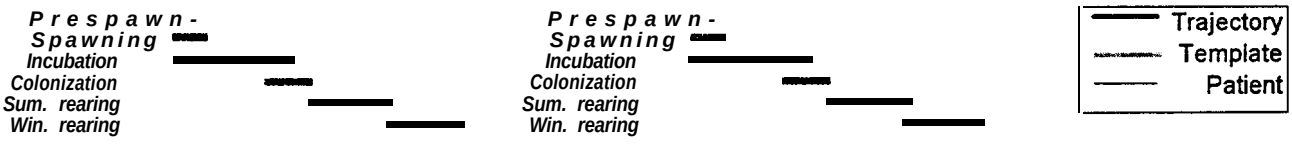
Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	268	1.14
	0	0.00
Traj. #2	294	1.17
	0	0.00
Traj. #3	280	1.07
	0	0.00
Traj. #4	267	1.10
	0	0.00
Traj. #5	237	1.05
	0	0.00
Traj. #6	213	0.81
	0	0.00
Traj. #7	225	0.99
	0	0.00
Traj. #8	213	0.96
	0	0.00
Traj. #9	394	2.04
	0	0.00

Spawning reach: Grande Ronde R.

Five Points Cr - Rock Cr (RM 133.4 - 133.8 from Snake R)

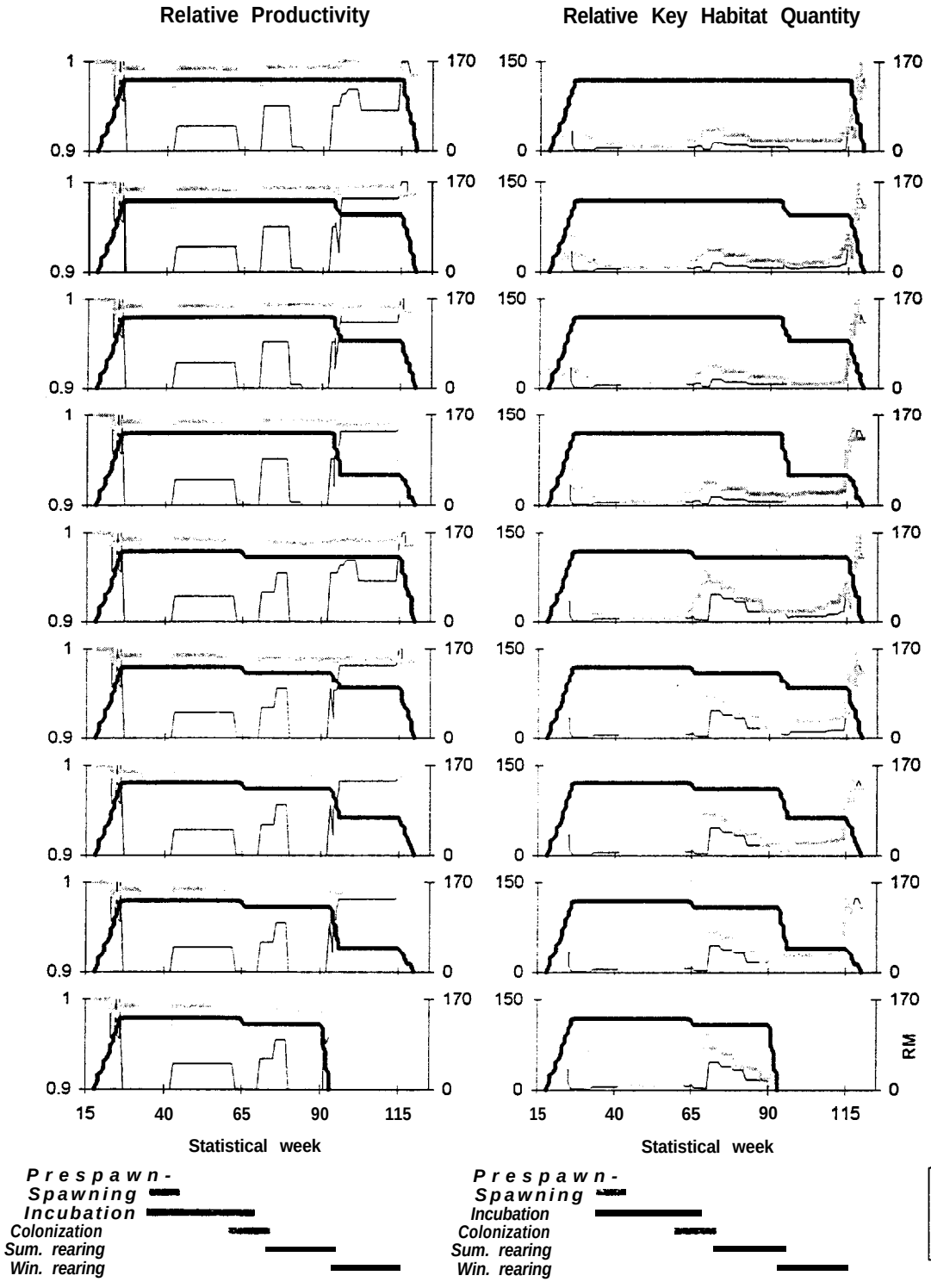


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
269	1.01
0	0.00
Traj. #2	
295	1.05
0	0.00
Traj. #3	
280	0.87
0	0.00
Traj. #4	
267	0.98
0	0.00
Traj. #5	
239	0.97
0	0.00
Traj. #6	
216	0.75
0	0.00
Traj. #7	
227	0.91
0	0.00
Traj. #8	
216	0.88
0	0.00
Traj. #9	
398	1.85
0	0.00



Spawning reach: Grande Ronde R.

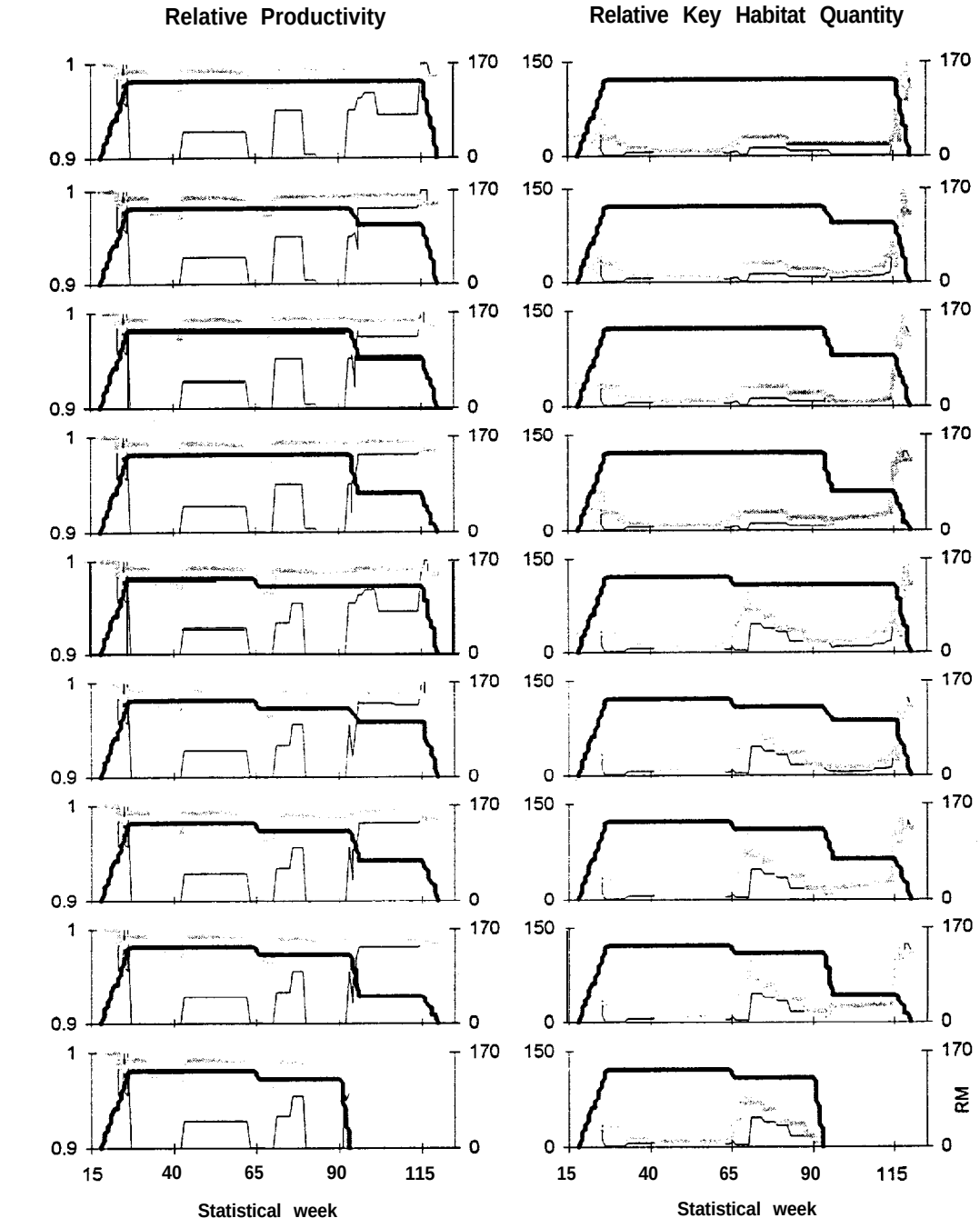
Rock Cr - Whiskey Cr (RM 133.8 - 136.6 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
269	0.96
0	0.00
Traj. #2	
296	1.03
0	0.00
Traj. #3	
280	0.86
0	0.00
Traj. #4	
268	0.96
0	0.00
Traj. #5	
243	0.95
0	0.00
Traj. #6	
226	0.90
0	0.00
Traj. #7	
251	0.97
0	0.00
Traj. #8	
228	0.92
0	0.00
Traj. #9	
434	1.95
0	0.00

Spawning reach: Grande Ronde R.

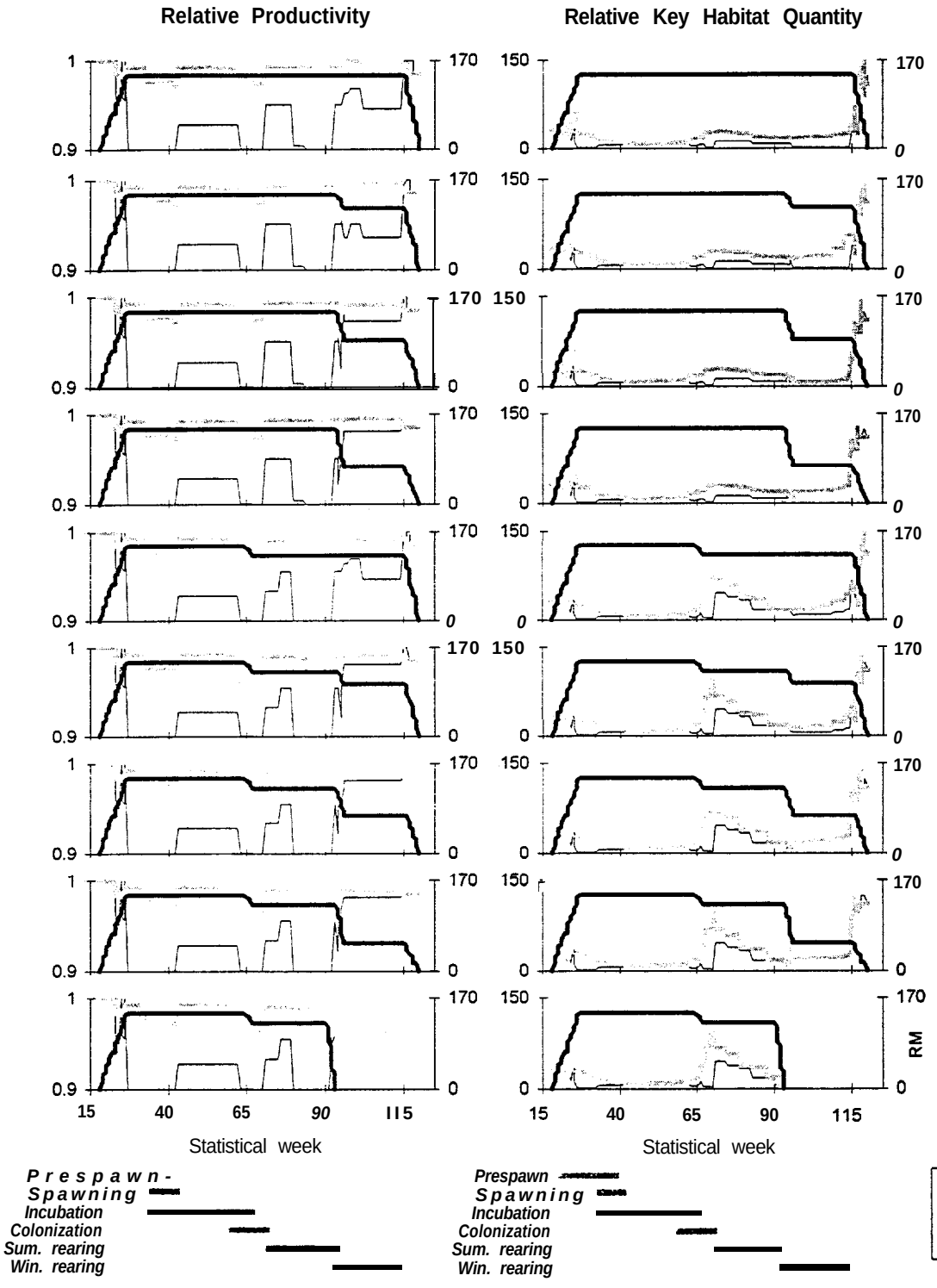
Whiskey Cr - Jordan Cr (RM 136.6 - 139.1 from Snake R)



Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	270	0.99
	0	0.00
Traj. #2	298	1.06
	0	0.00
Traj. #3	281	0.88
	0	0.00
Traj. #4	296	1.08
	0	0.00
Traj. #5	243	0.99
	0	0.00
Traj. #6	227	0.89
	0	0.00
Traj. #7	252	1.01
	0	0.00
Traj. #8	228	0.95
	0	0.00
Traj. #9	434	2.05
	0	0.00

Spawning reach: Grande Ronde R.

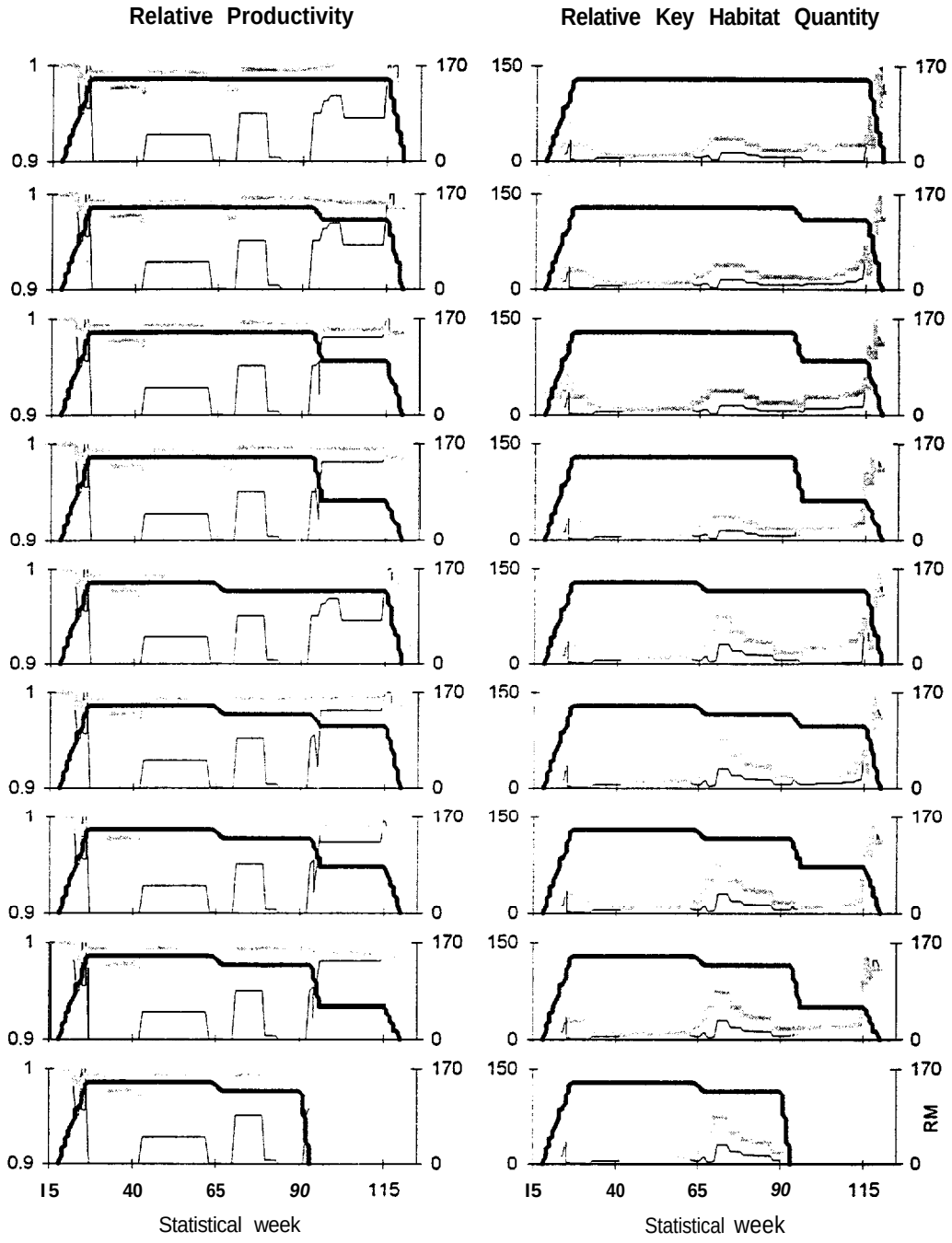
Jordan Cr - Beaver Cr (RM 139.1 - 145.8 from Snake R)

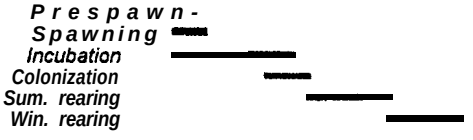


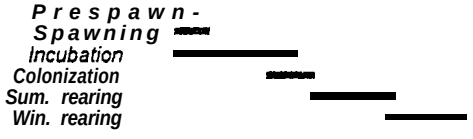
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
269	0.96
0	0.00
Traj. #2	
314	1.12
0	0.00
Traj. #3	
280	0.85
0	0.00
Traj. #4	
295	1.05
0	0.00
Traj. #5	
245	0.97
0	0.00
Traj. #6	
241	0.93
0	0.00
Traj. #7	
254	1.00
0	0.00
Traj. #8	
230	0.91
0	0.00
Traj. #9	
438	2.01
0	0.00

Spawning reach: Grande Ronde R.

Beaver Cr - Meadow Cr (RM 145.8 - 147.0 from Snake R)





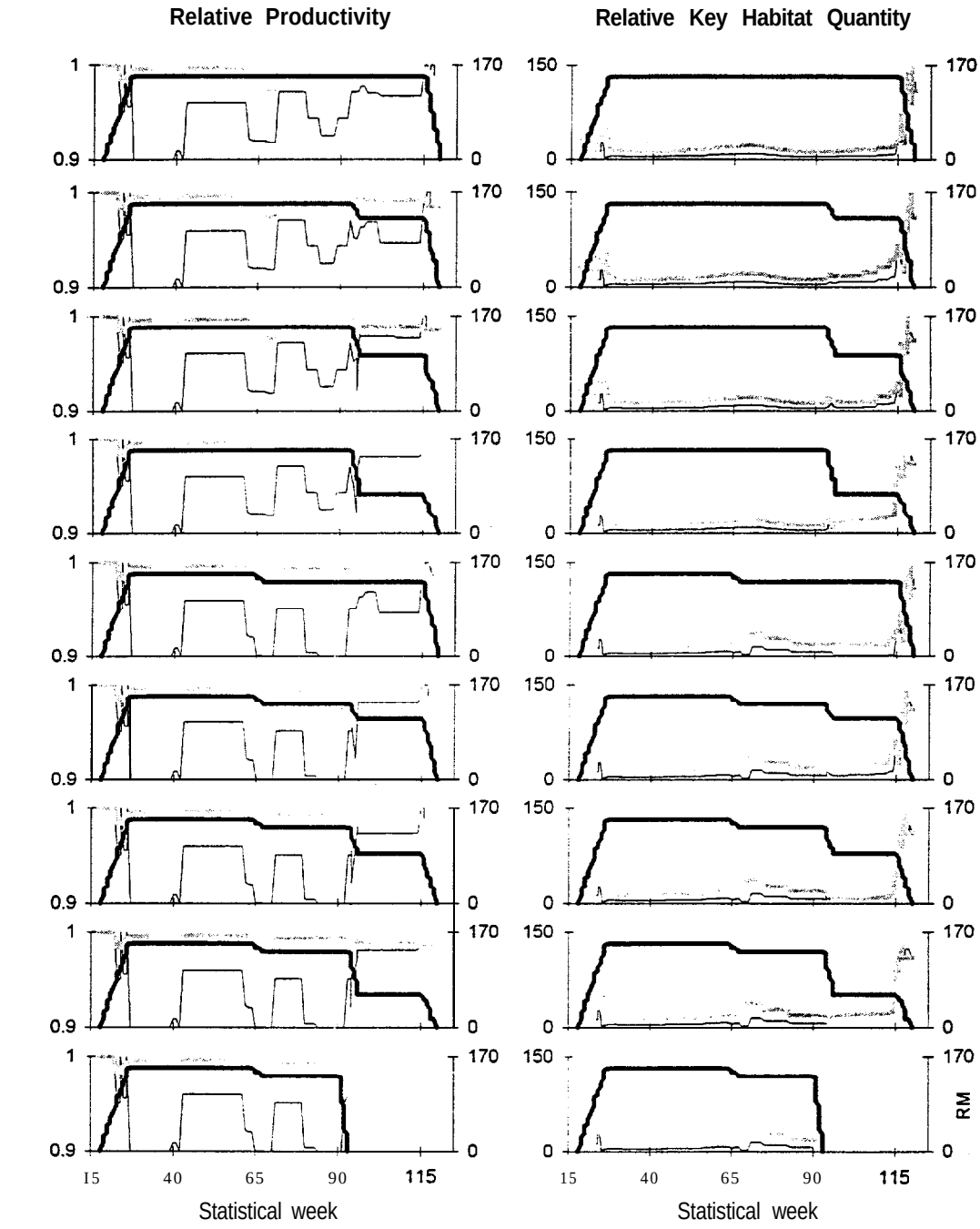


Template Patient	
Cum. Prod.	Cum. Cap.
Traj . #1	
283	1.03
0	0.00
Traj. #2	
299	1.08
0	0.00
Traj. #3	
280	1.04
0	0.00
Traj. #4	
309	1.11
0	0.00
Traj. #5	
268	1.03
0	0.00
Traj. #6	
294	1.06
0	0.00
Traj. #7	
279	0.97
0	0.00
Traj. #8	
266	0.99
0	0.00
Traj. #9	
499	2.21
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Meadow Cr - Fly Cr (RM 147.0 - 151.3 from Snake R)

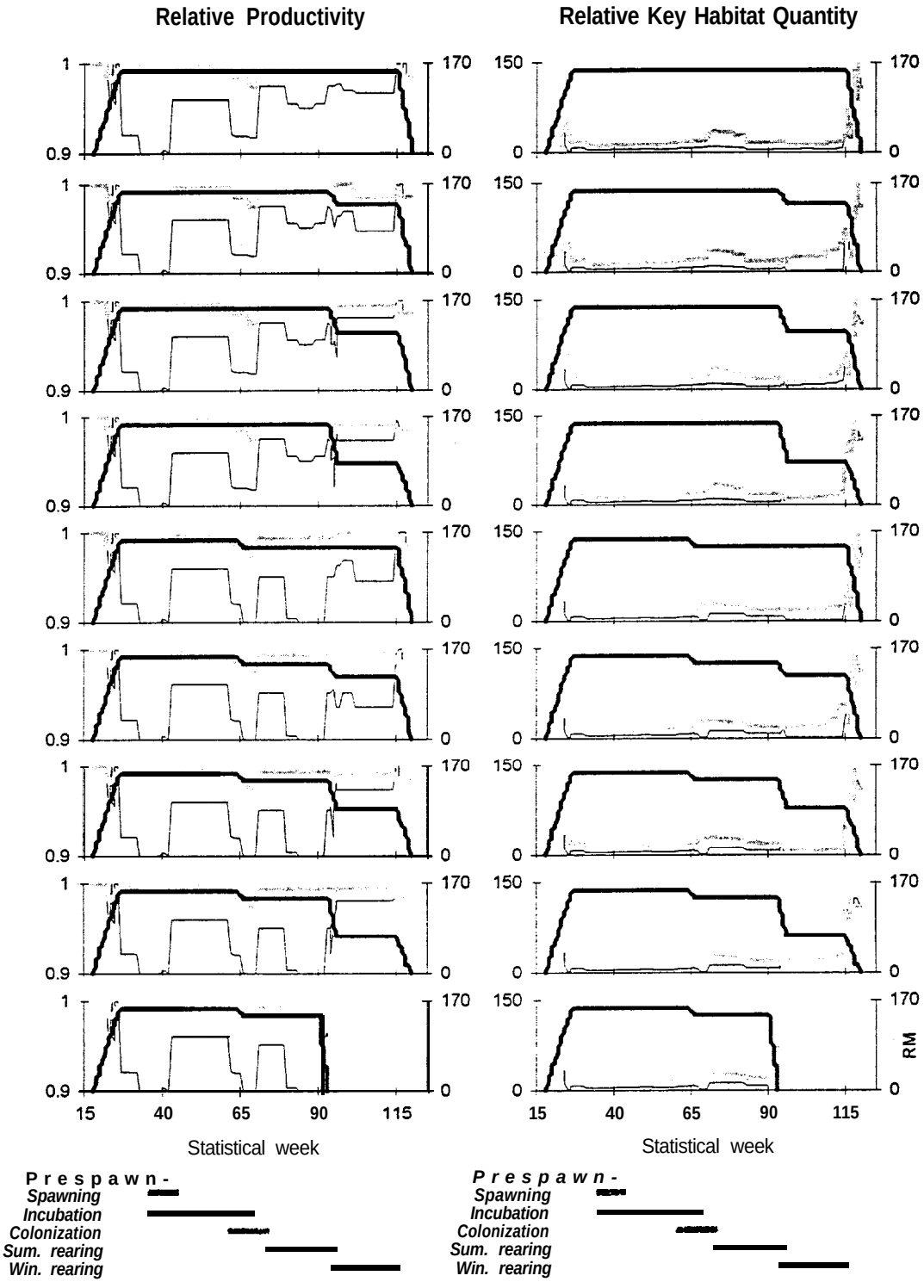


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
352	0.83
2	0.00
Traj. #2	
350	0.87
1	0.00
Traj. #3	
329	0.80
2	0.00
Traj. #4	
361	0.89
2	0.00
Traj. #5	
344	0.94
0	0.00
Traj. #6	
377	1.01
0	0.00
Traj. #7	
358	0.85
0	0.00
Traj. #8	
342	0.94
0	0.00
Traj. #9	
641	2.07
0	0.00

Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Fly Cr - head of canyon 1.3 miles downstream of Sheep Cr (RM 151.3 - 159.4 from Snake R)

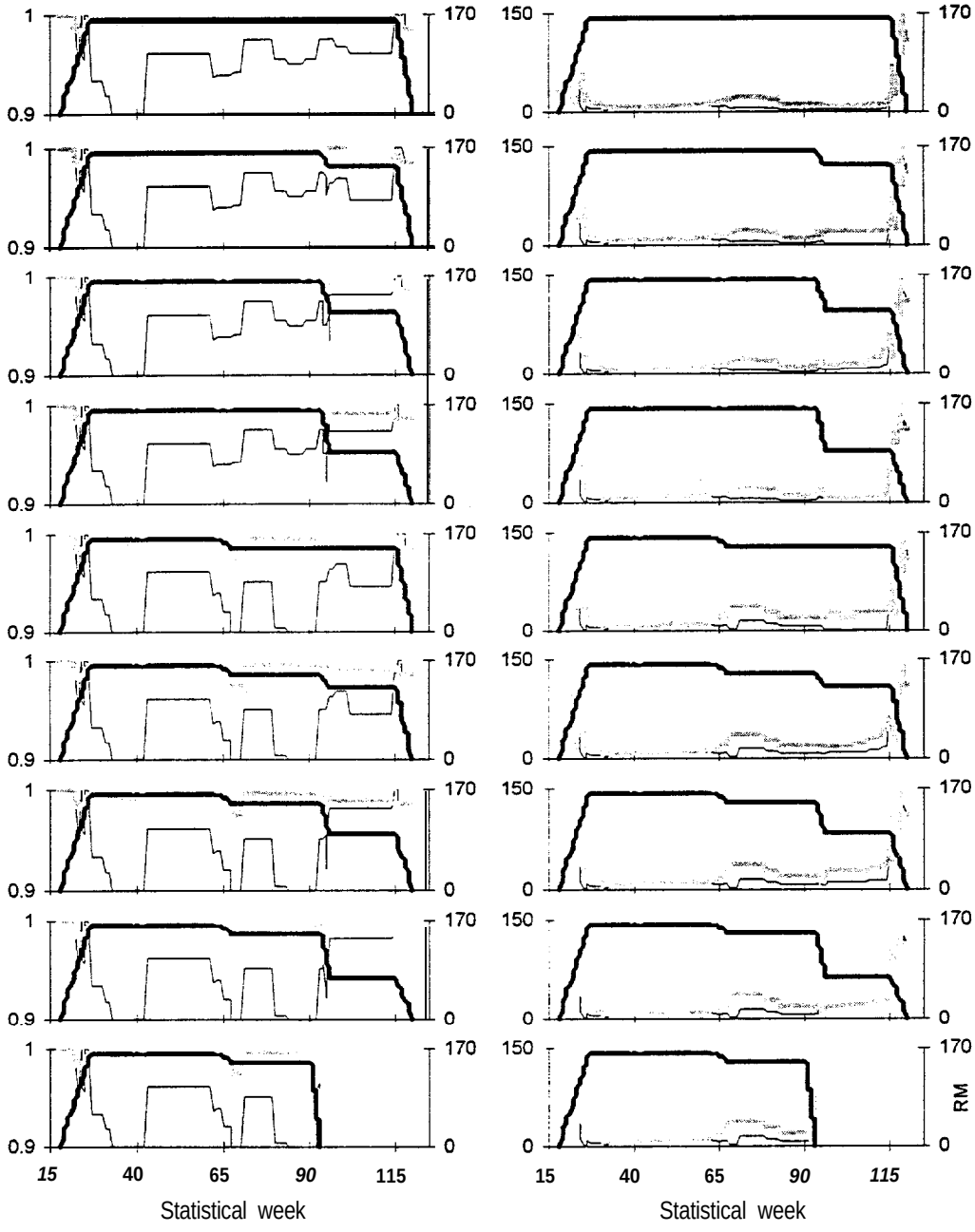


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
352	0.94
4	0.01
Traj. #2	
328	0.94
3	0.00
Traj. #3	
364	0.99
4	0.01
Traj. #4	
344	0.91
4	0.01
Traj. #5	
345	0.97
0	0.00
Traj. #6	
402	1.14
0	0.00
Traj. #7	
360	0.86
0	0.00
Traj. #8	
379	1.06
0	0.00
Traj. #9	
647	2.14
0	0.00

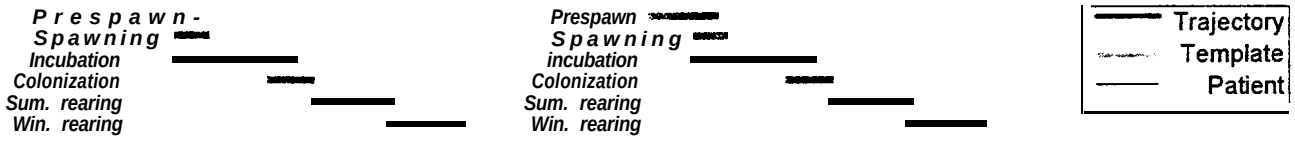
Trajectory
Template
Patient

Spawning reach: Grande Ronde R.

Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 - 164.2 from Snake R

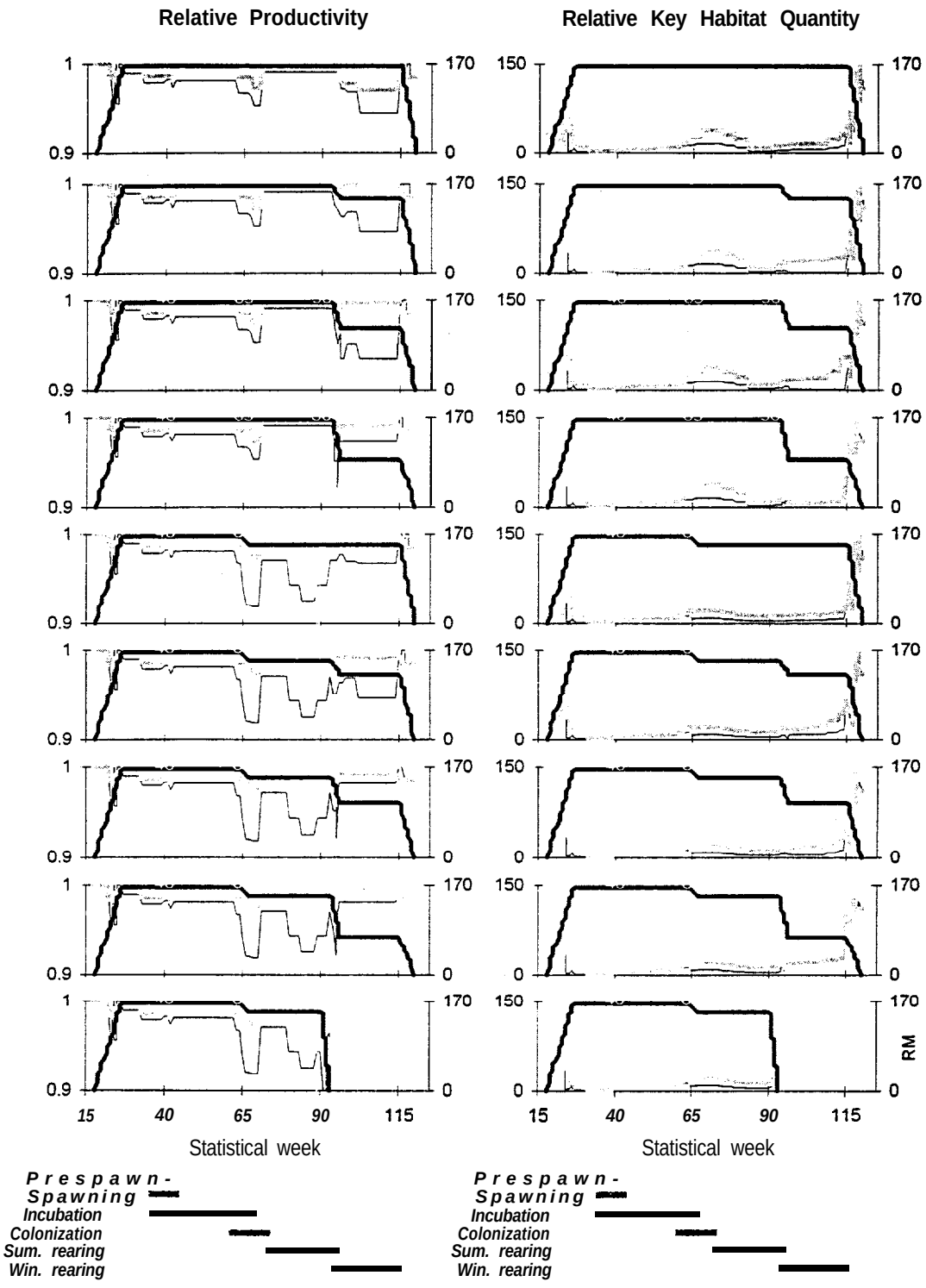


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
410	0.76
5	0.01
Traj. #2	
379	0.78
4	0.01
Traj. #3	
421	0.85
7	0.01
Traj. #4	
398	0.73
6	0.01
Traj. #5	
373	0.89
0	0.00
Traj. #6	
394	0.94
0	0.00
Traj. #7	
369	0.89
0	0.00
Traj. #8	
407	0.96
0	0.00
Traj. #9	
690	1.89
0	0.00



Spawning reach: Grande Ronde R.

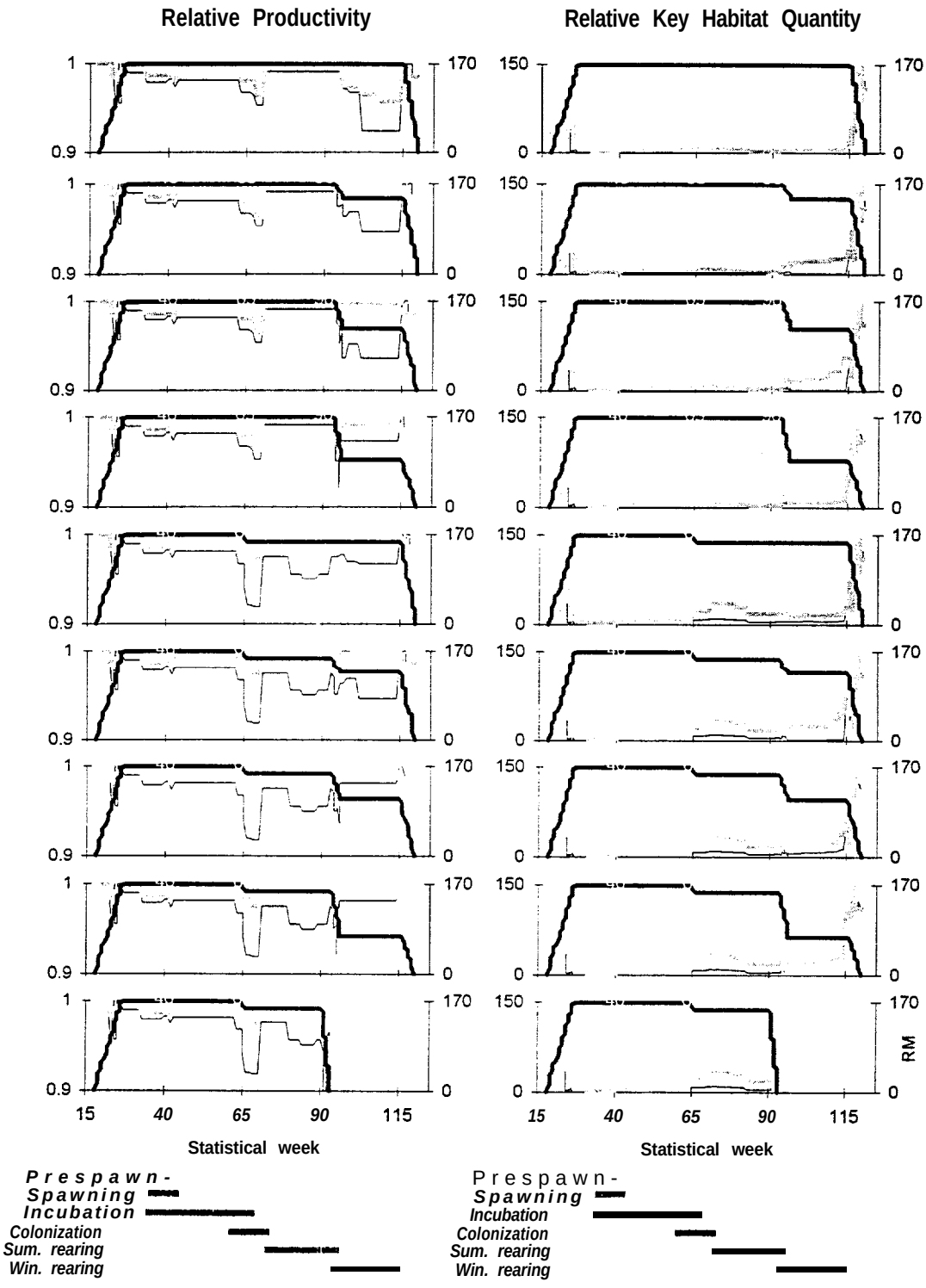
LimberJim Cr - Clear Cr (RM 164.2 - 166.9 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
248	0.39
88	0.03
Traj. #2	
326	0.52
84	0.03
Traj. #3	
381	0.61
62	0.02
Traj. #4	
344	0.50
120	0.05
Traj. #5	
336	0.52
36	0.01
Traj. #6	
336	0.54
25	0.01
Traj. #7	
331	0.52
43	0.02
Traj. #8	
345	0.55
41	0.02
Traj. #9	
594	1.03
80	0.03

Spawning reach: Grande Ronde R.

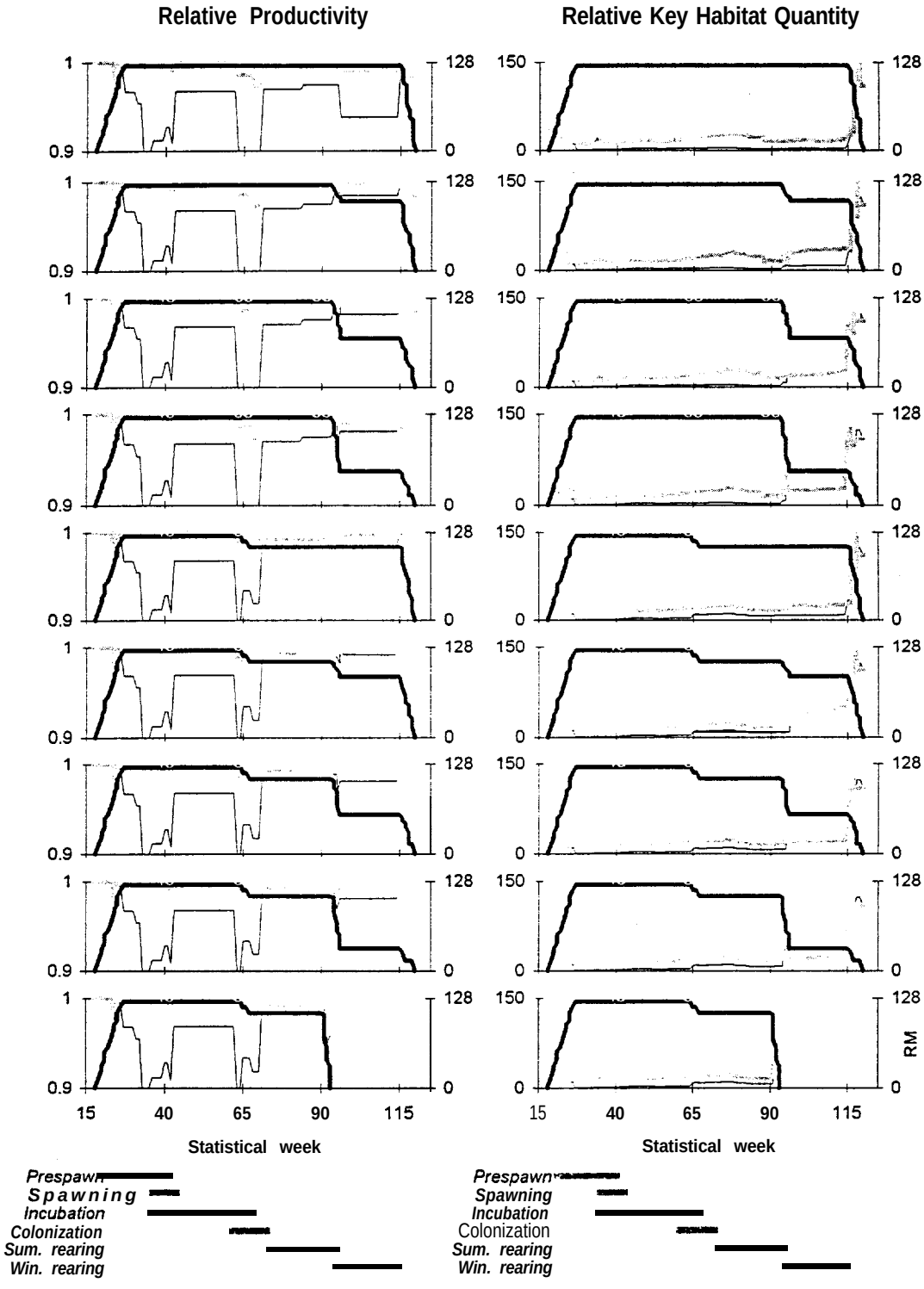
Clear Cr - headwaters (RM 166.9 - 170.1 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
195	0.17
66	0.06
Traj. #2	
309	0.29
86	0.07
Traj. #3	
361	0.34
63	0.05
Traj. #4	
325	0.29
120	0.11
Traj . #5	
332	0.42
48	0.05
Traj. #6	
310	0.40
33	0.03
Traj. #7	
344	0.44
57	0.06
Traj. #8	
341	0.44
56	0.06
Traj. #9	
586	0.81
106	0.12

Spawning reach: Hurricane Cr.

Mouth - Lower Alderslope Ditch (RM 121.9 - 124.9 from Snake R)

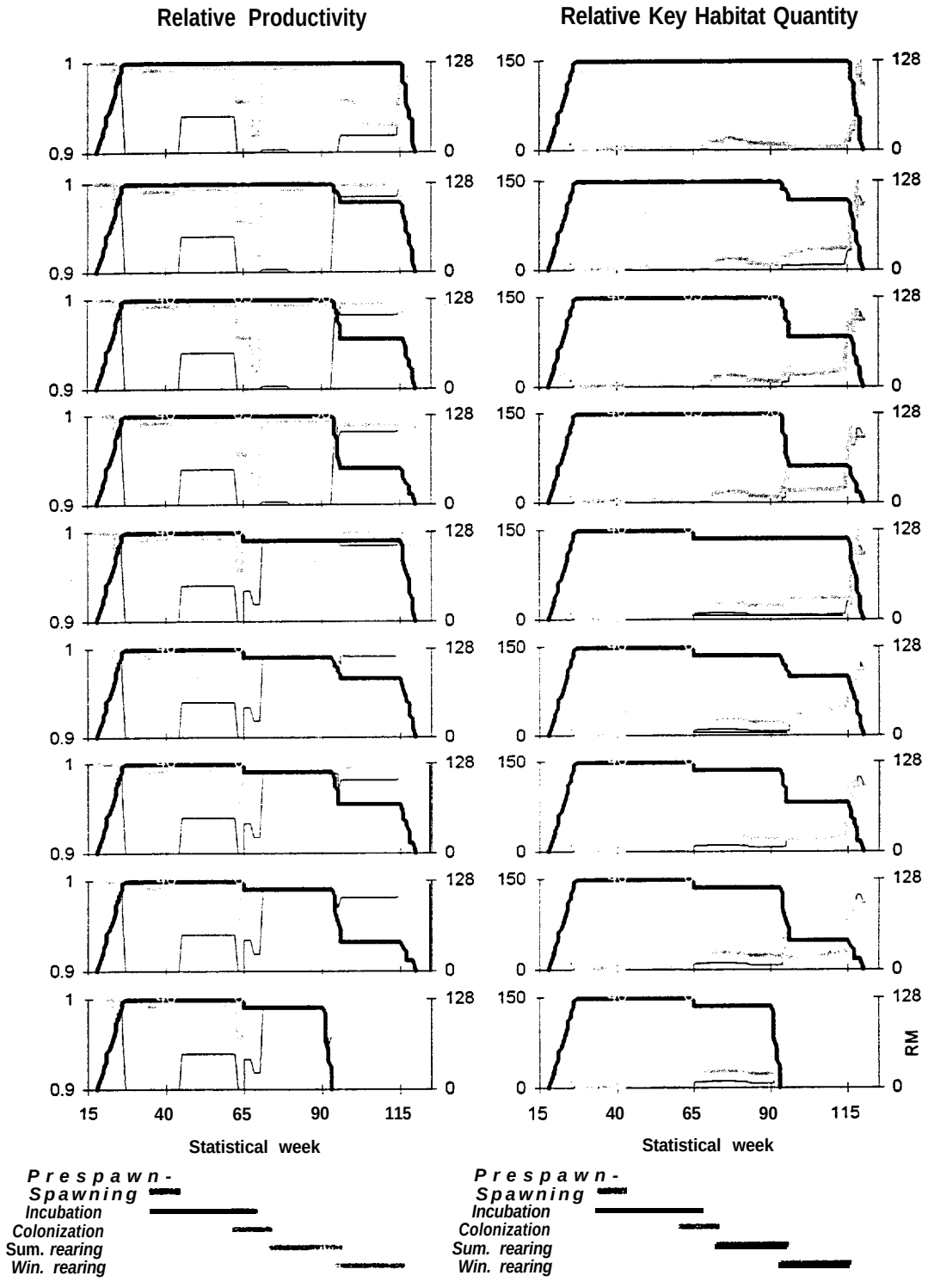


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
420	0.84
4	0.00
Traj. #2	
468	1.00
9	0.00
Traj. #3	
439	0.92
9	0.00
Traj. #4	
397	0.85
9	0.00
Traj. #5	
501	0.98
32	0.01
Traj. #6	
468	0.97
35	0.01
Traj. #7	
423	0.84
29	0.01
Traj. #8	
442	0.89
28	0.01
Traj. #9	
792	1.81
60	0.02

Trajectory
Template
Patient

Spawning reach: Hurricane Cr.

Lower Alderslope Ditch - Upper Alderslope Ditch Diversion (RM 124.9 - 128.2 from Snake R)

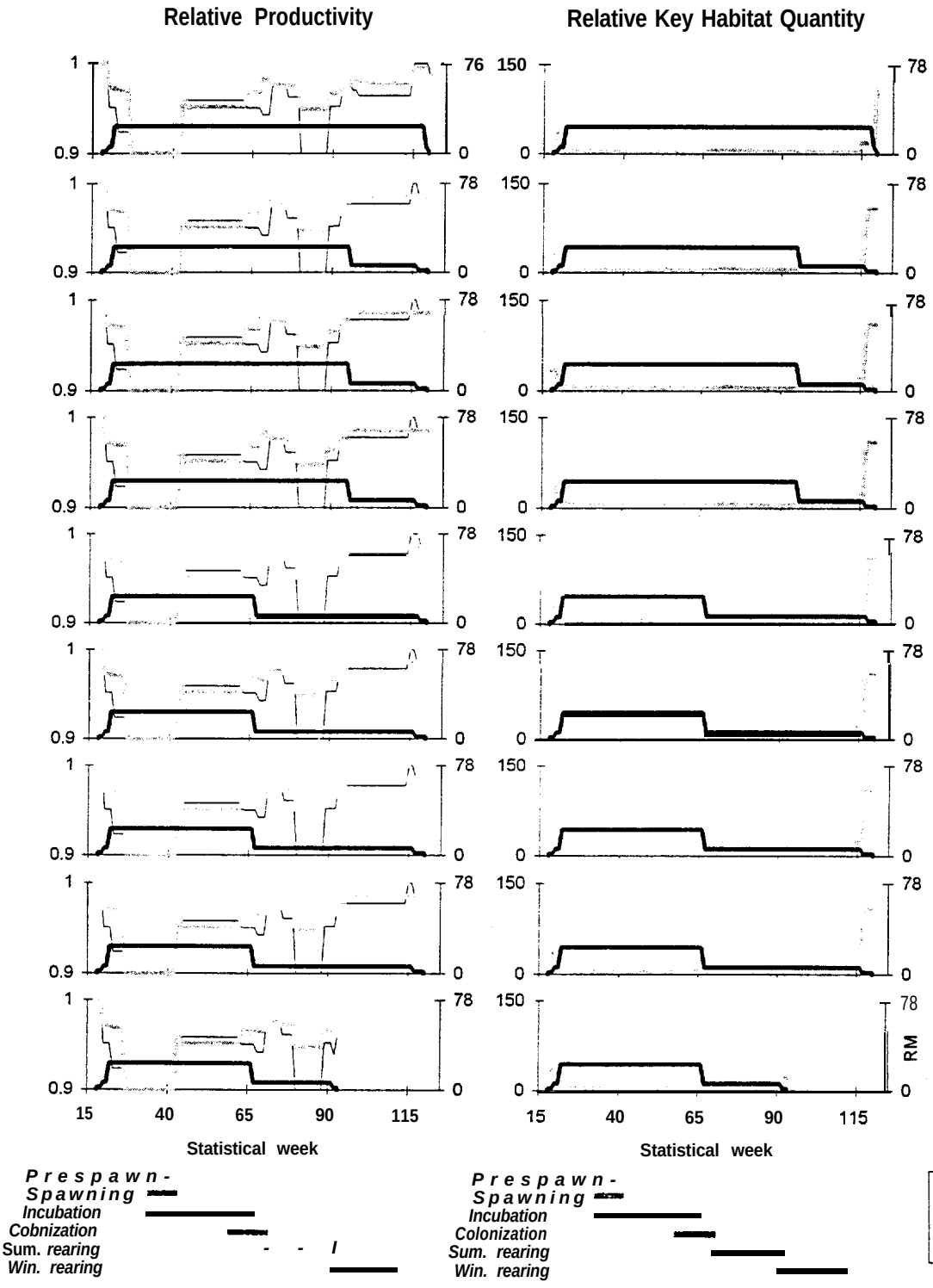


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
92	0.04
0	0.00
Traj. #2	
287	0.11
0	0.00
Traj. #3	
269	0.11
0	0.00
Traj. #4	
243	0.10
0	0.00
Traj. #5	
422	0.17
0	0.00
Traj. #6	
374	0.15
0	0.00
Traj. #7	
374	0.15
0	0.00
Traj. #8	
353	0.14
0	0.00
Traj. #9	
633	0.26
0	0.00

Trajectory
Template
Patient

Spawning reach: Joseph Cr.

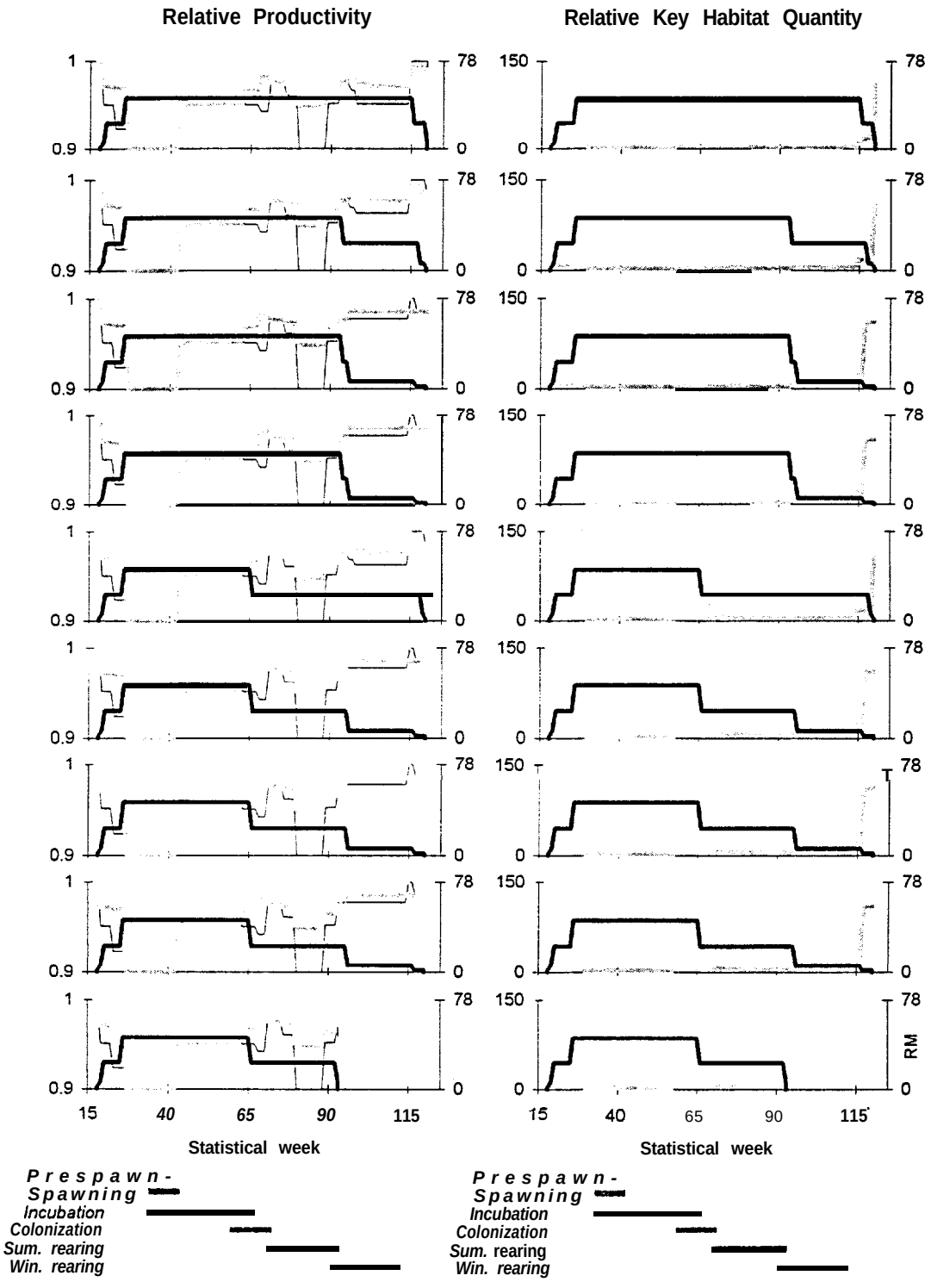
Cottonwood Cr - Swamp Cr (RM 8.2 - 37.7 from Snake R)



Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	0	0.00
	0	0.00
Traj. #2	0	0.00
	0	0.00
Traj. #3	0	0.00
	0	0.00
Traj. #4	0	0.00
	0	0.00
Traj. #5	0	0.00
	0	0.00
Traj. #6	0	0.00
	0	0.00
Traj. #7	0	0.00
	0	0.00
Traj. #8	0	0.00
	0	0.00
Traj. #9	0	0.00
	0	0.00

Spawning reach: Joseph Cr.

Swamp Cr - Chesnimnus Cr (RM 37.7 - 52.7 from Snake R)

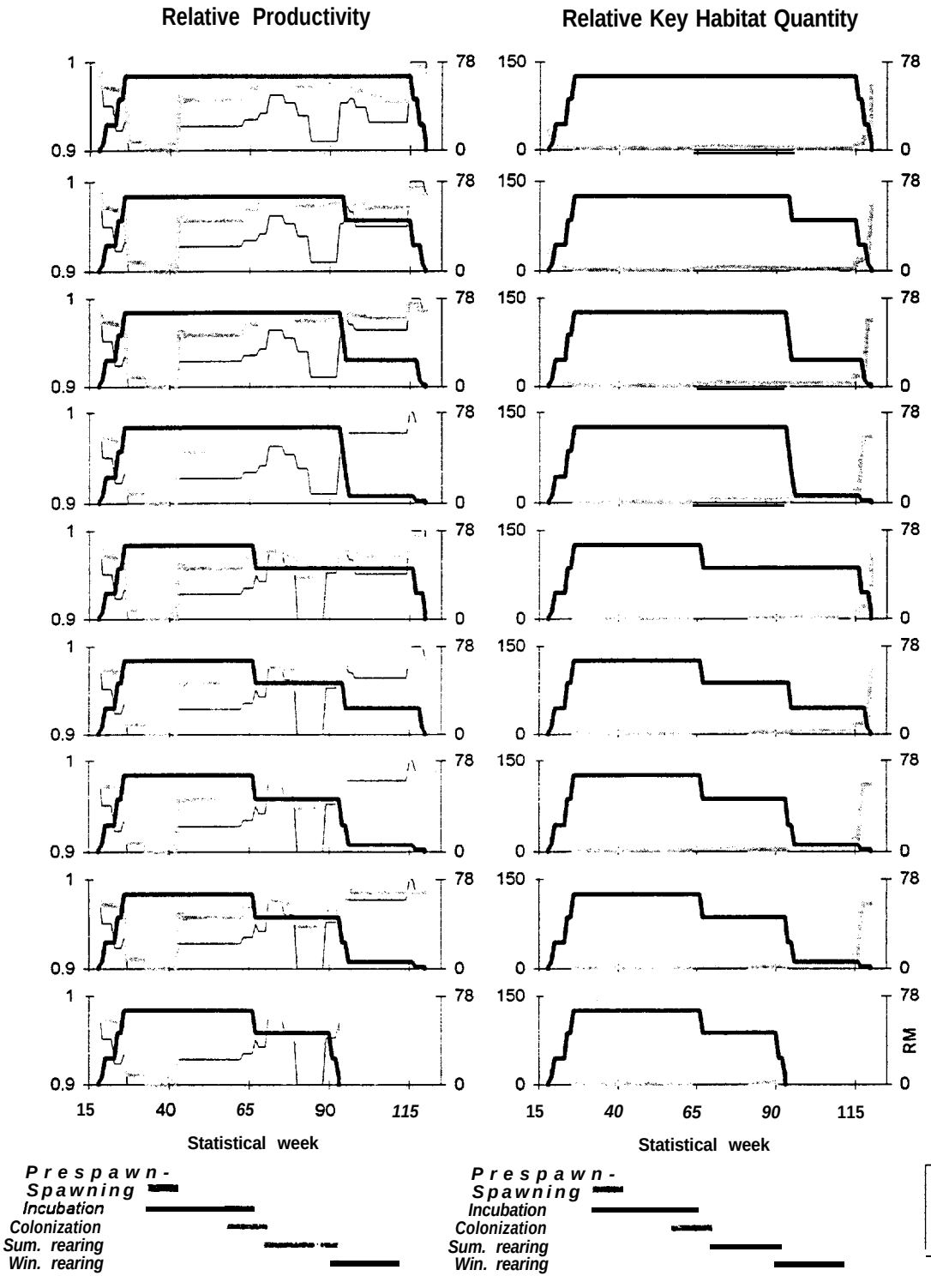


Template Patient	Cum. Prod.[a]	Cum. Cap.
Traj. #1	0	0.00
	0	0.00
Traj. #2	0	0.00
	0	0.00
Traj. #3	0	0.00
	0	0.00
Traj. #4	0	0.00
	0	0.00
Traj. #5	0	0.00
	0	0.00
Traj. #6	0	0.00
	0	0.00
Traj. #7	0	0.00
	0	0.00
Traj. #8	0	0.00
	0	0.00
Traj. #9	0	0.00
	0	0.00

Trajectory
Template
Patient

Spawning reach: Chesnimnus Cr.

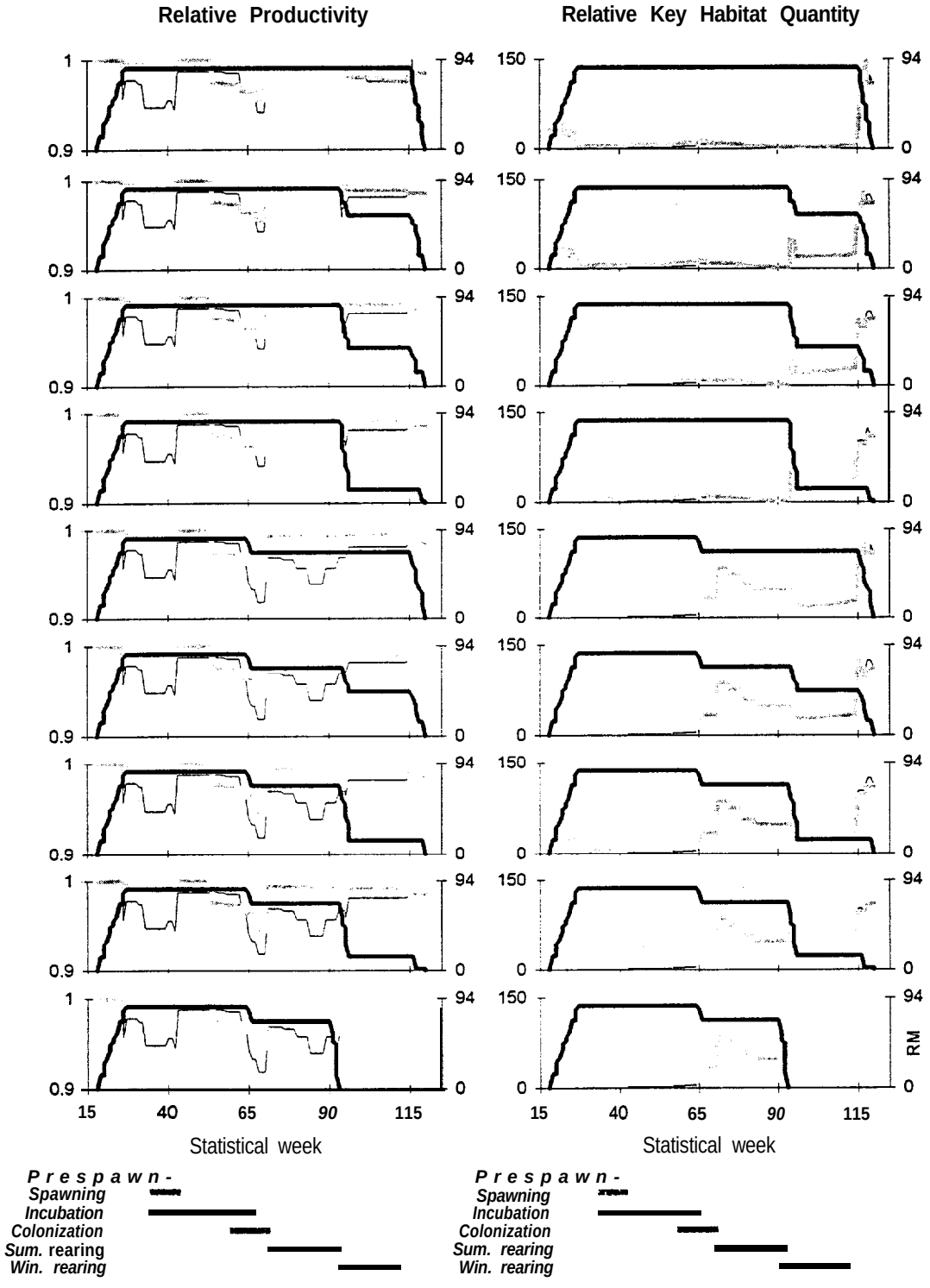
Confluence with Crow Cr - South Fork (RM 52.7 - 77.7 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
6	0.01
0	0.00
Traj. #2	
8	0.01
0	0.00
Traj. #3	
9	0.01
0	0.00
Traj. #4	
10	0.01
0	0.00
Traj. #5	
6	0.01
0	0.00
Traj. #6	
6	0.01
0	0.00
Traj. #7	
7	0.01
0	0.00
Traj. #8	
7	0.01
0	0.00
Traj. #9	
15	0.01
0	0.00

Spawning reach: Lookingglass Cr.

Mouth - Little Lookingglass Cr (RM 83.4 - 87.6 from Snake R)

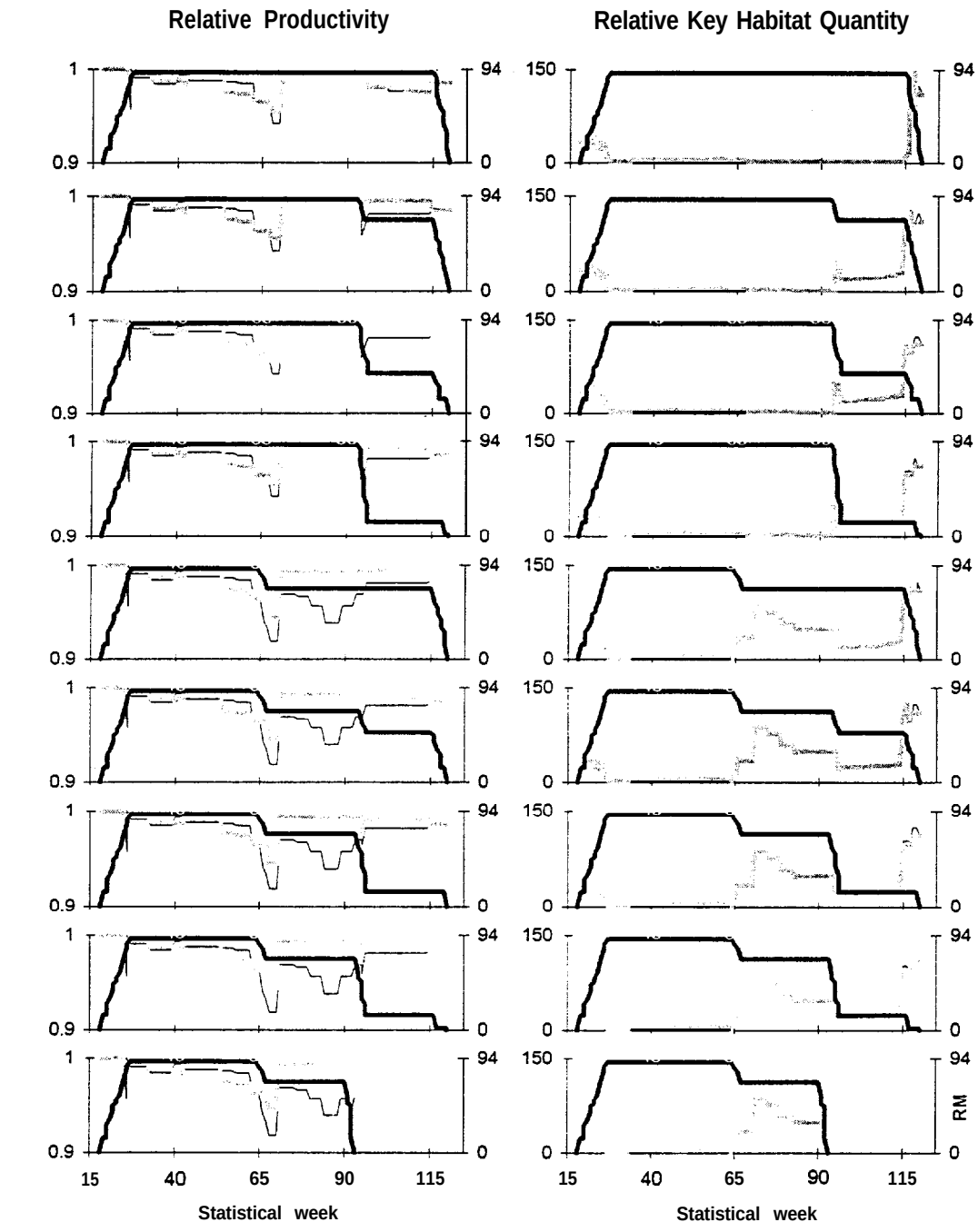


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
208	0.18
107	0.12
Traj. #2	
251	0.26
109	0.14
Traj. #3	
263	0.27
109	0.14
Traj. #4	
260	0.27
109	0.14
Traj. #5	
269	0.38
42	0.07
Traj. #6	
243	0.35
42	0.07
Traj . #7	
251	0.36
42	0.07
Traj. #8	
249	0.36
42	0.07
Traj. #9	
448	0.66
96	0.15

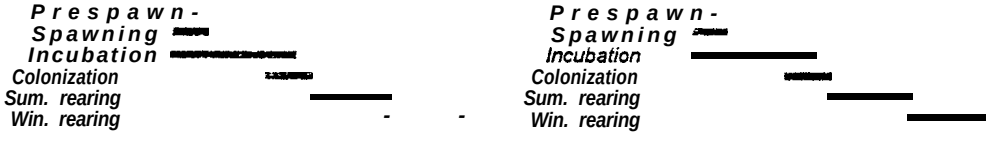
Trajectory
Template
Patient

Spawning reach: Lookingglass Cr.

Little Lookingglass Cr - headwaters (RM **87.6 - 93.8 from** Snake R)



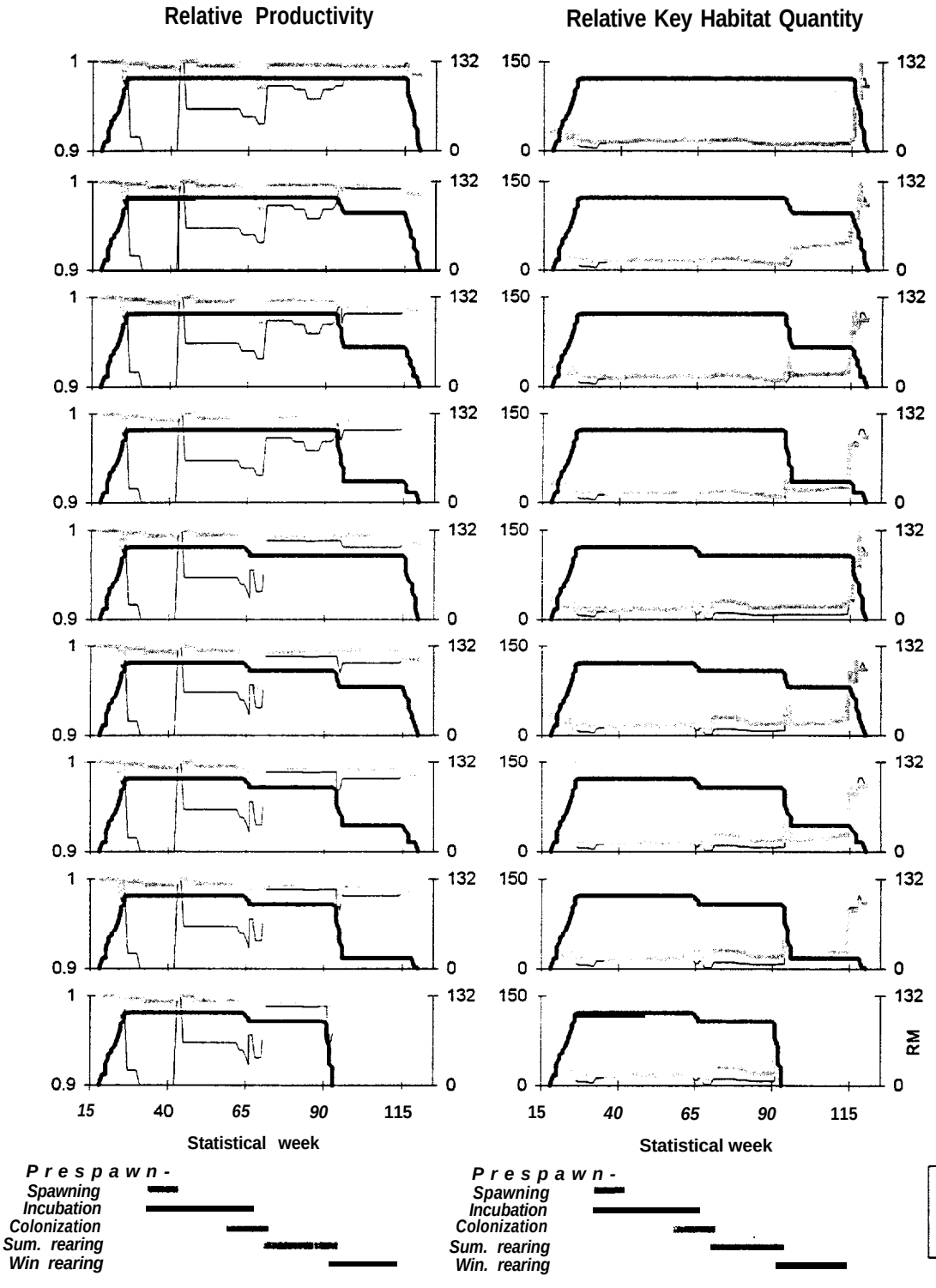
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
207	0.11
182	0.10
Traj. #2	
277	0.17
186	0.12
Traj. #3	
Traj. #4	
259	0.16
184	0.12
Traj. #5	
268	0.23
70	0.06
Traj. #6	
242	0.21
70	0.06
Traj. #7	
250	0.21
70	0.06
Traj. #8	
249	0.21
69	0.06
Traj. #9	
445	0.39
159	0.14



Trajectory
Template
Patient

Spawning reach: Lostine R.

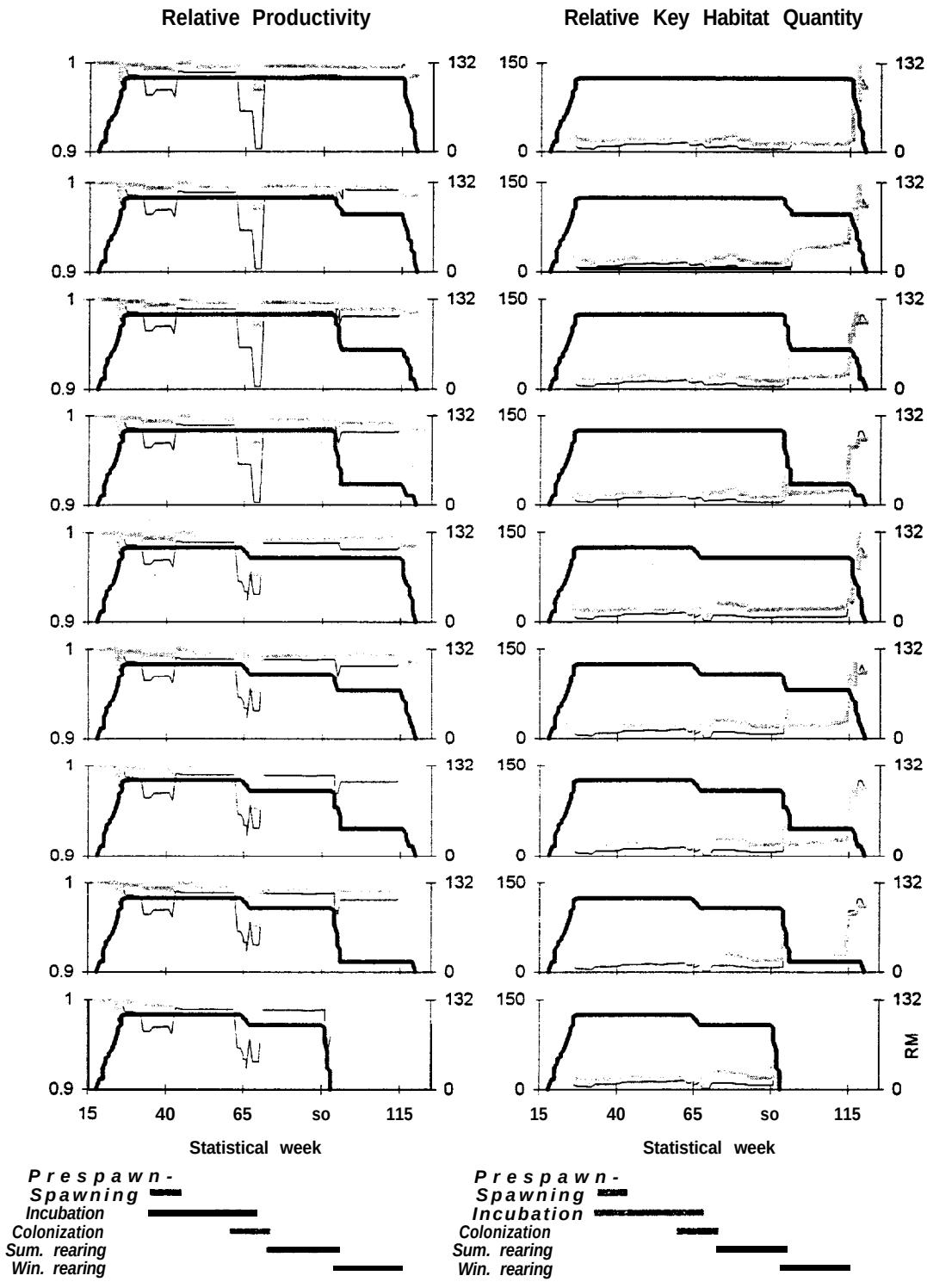
Mouth - Cleatwater Ditch (RM 105.8 - 108.3 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
432	0.92
2	0.01
Traj. #2	
427	1.05
3	0.01
Traj . #3	
" " :	I
Traj. #4	
403	0.96
2	0.01
Traj . #5	
372	0.94
4	0.01
Traj. #6	
372	0.96
4	0.01
Traj. #7	
352	0.92
4	0.01
Traj. #8	
349	0.91
4	0.01
Traj. #9	
628	1.85
8	0.02

Spawning reach: Lostine R.

Cleatwater Ditch - Cross Country Ditch (RM 108.3 - 110.8 from Snake R)

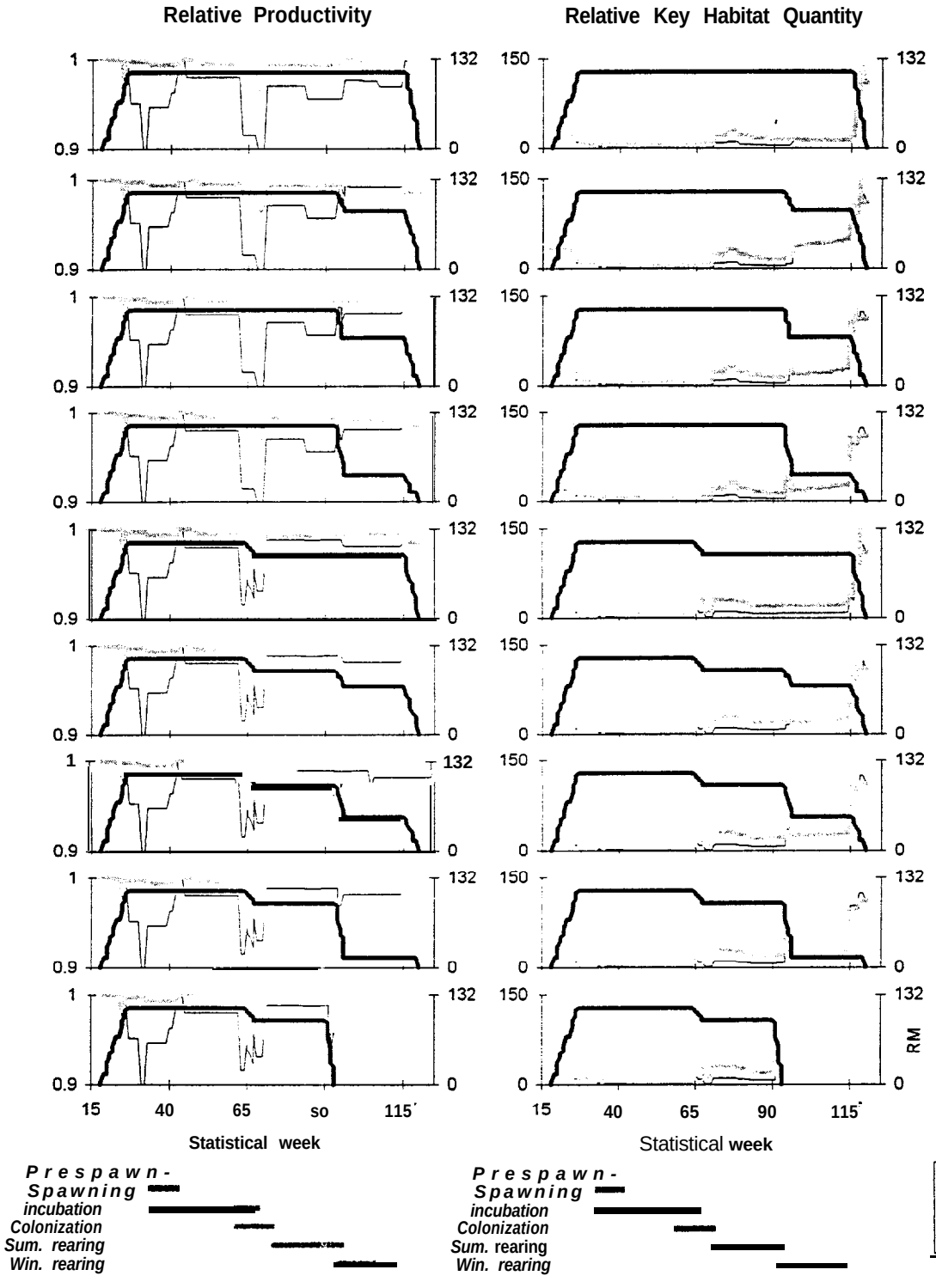


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
433	0.99
108	0.16
Traj. #2	
428	1.11
127	0.19
Traj. #3	
386	0.96
104	0.16
Traj. #4	
404	1.02
103	0.15
Traj. #5	
375	0.97
120	0.16
Traj. #6	
375	0.99
118	0.16
Traj. #7	
354	0.94
117	0.16
Traj. #8	
352	0.93
116	0.16
Traj. #9	
633	1.91
247	0.35

Trajectory
Template
Patient

Spawning reach: Lostine R.

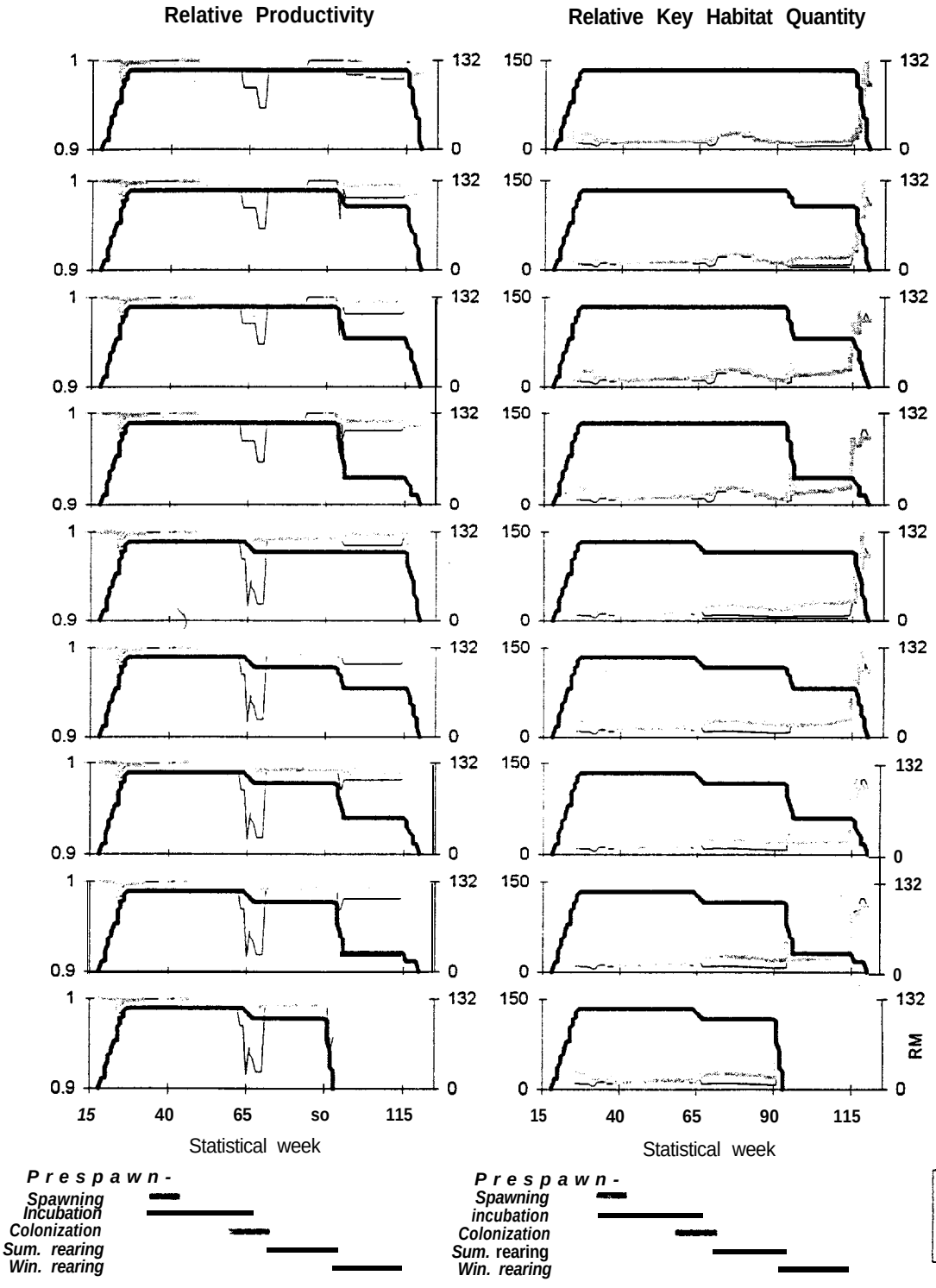
Cross Country Ditch - Sheep Ridge Dam (RM 110.8 - 115.0 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
333	0.57
19	0.04
Traj. #2	
399	0.73
28	0.06
Traj. #3	
398	0.71
23	0.05
Traj. #4	
375	0.68
23	0.05
Traj. #5	
376	0.71
59	0.11
Traj. #6	
375	0.71
59	0.11
Traj. #7	
340	0.66
58	0.11
Traj. #8	
355	0.68
57	0.11
Traj. #9	
636	1.33
120	0.24

Spawning reach: Lostine R.

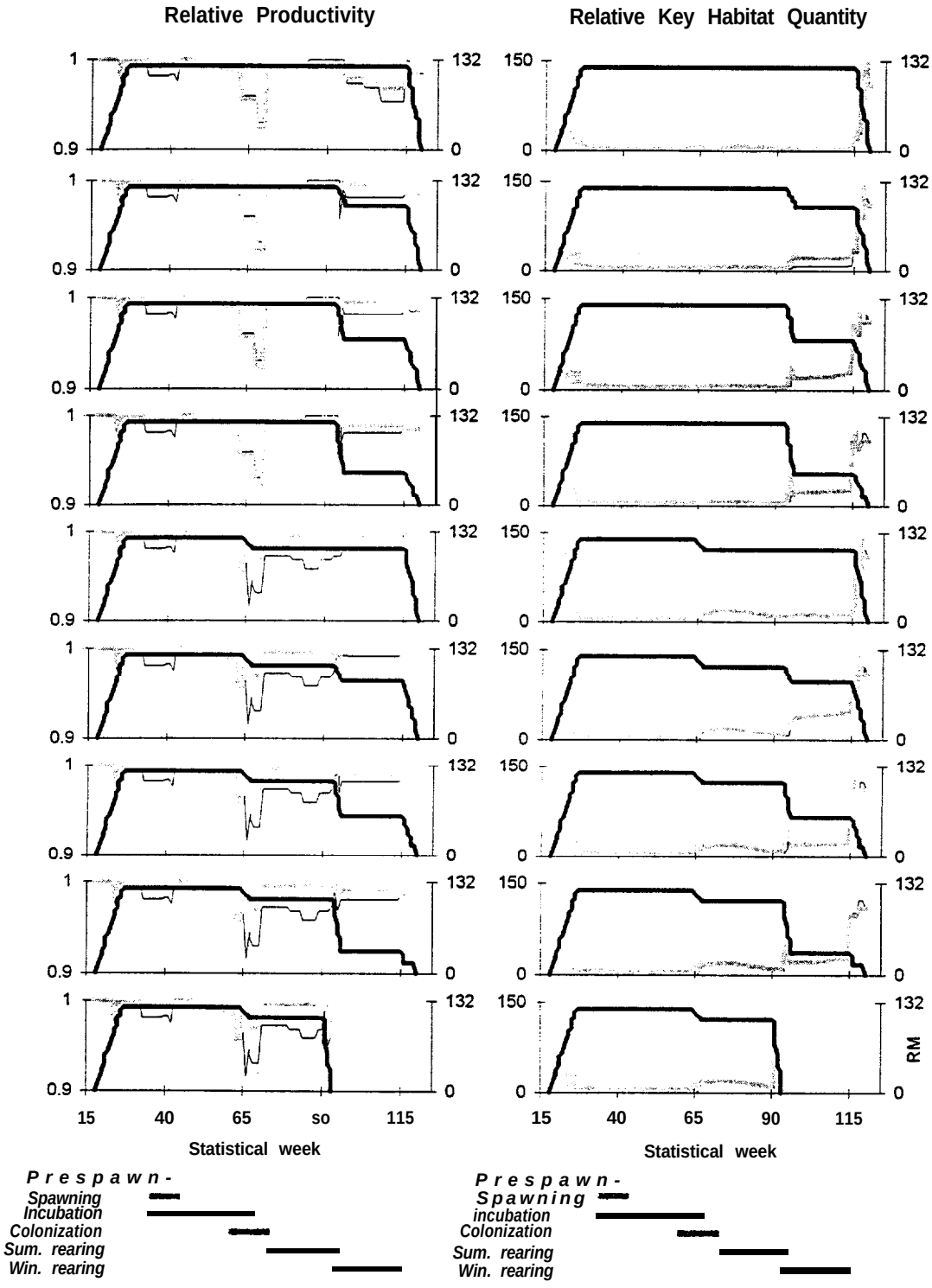
Sheep Ridge Dam - Silver Cr (RM 115.0 - 120.0 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
365	0.90
306	0.43
Traj. #2	
408	1.08
286	0.43
Traj. #3	
407	1.09
290	0.47
Traj. #4	
384	1.05
287	0.47
Traj. #5	
446	1.27
233	0.35
Traj. #6	
417	1.18
214	0.35
Traj. #7	
377	1.07
210	0.34
Traj. #8	
395	1.13
208	0.34
Traj. #9	
705	2.36
437	0.77

Spawning reach: Lostine R.

Silver Cr - Lake Cr (RM 120.0 - 124.6 from Snake R)

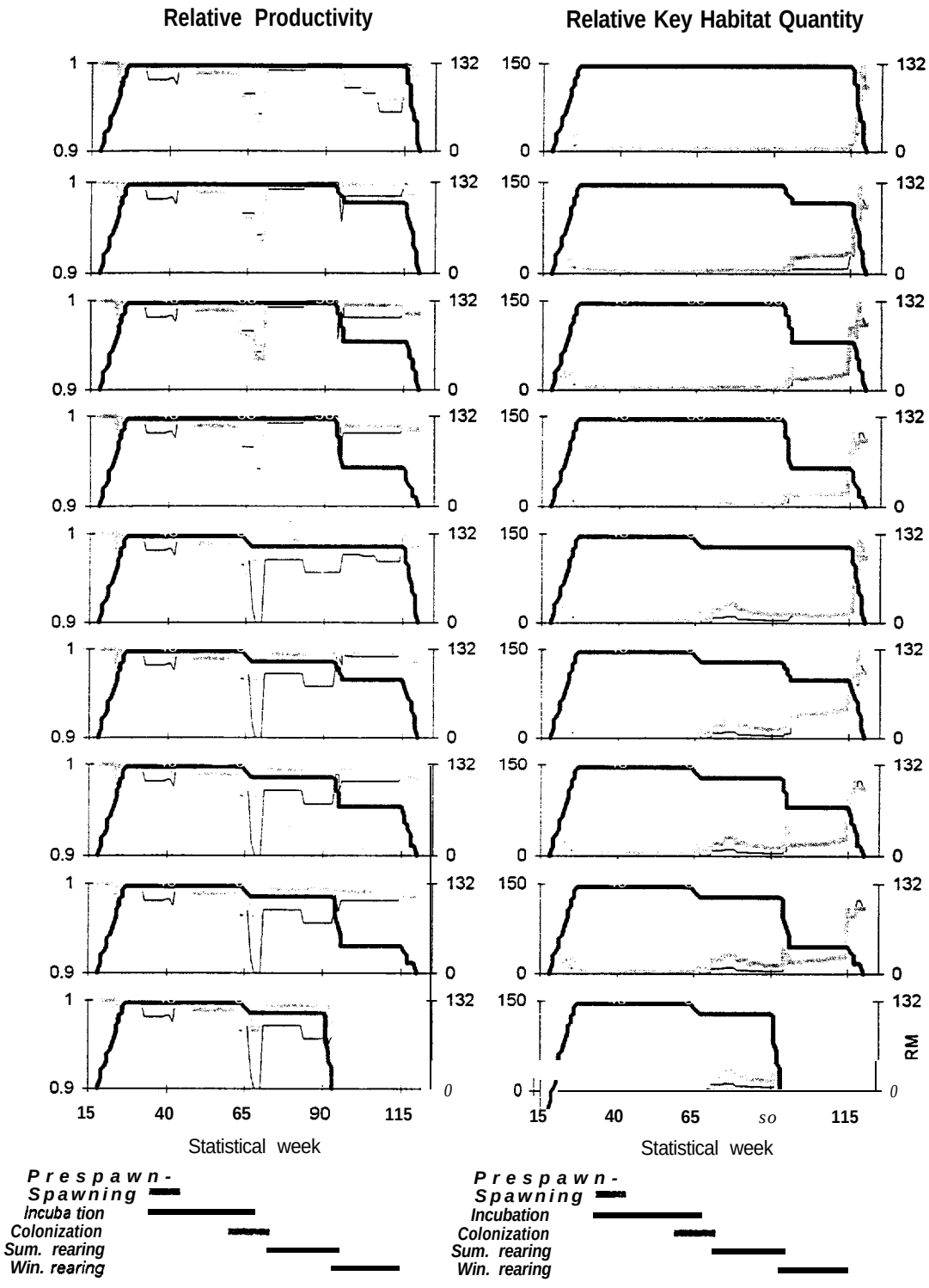


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
176	0.23
151	0.20
Traj. #2	
262	0.39
200	0.28
Traj. #3	
261	0.39
201	0.29
Traj. #4	
236	0.36
199	0.29
Traj. #5	
373	0.59
101	0.18
Traj. #6	
368	0.64
123	0.23
Traj. #7	
333	0.56
100	0.18
Traj. #8	
348	0.59
99	0.18
Traj. #9	
617	1.16
222	0.42

Trajectory
Template
Patient

Spawning reach: Lostine R.

Lake Cr - East Lostine R (RM 124.6 - 131.7 from Snake R)

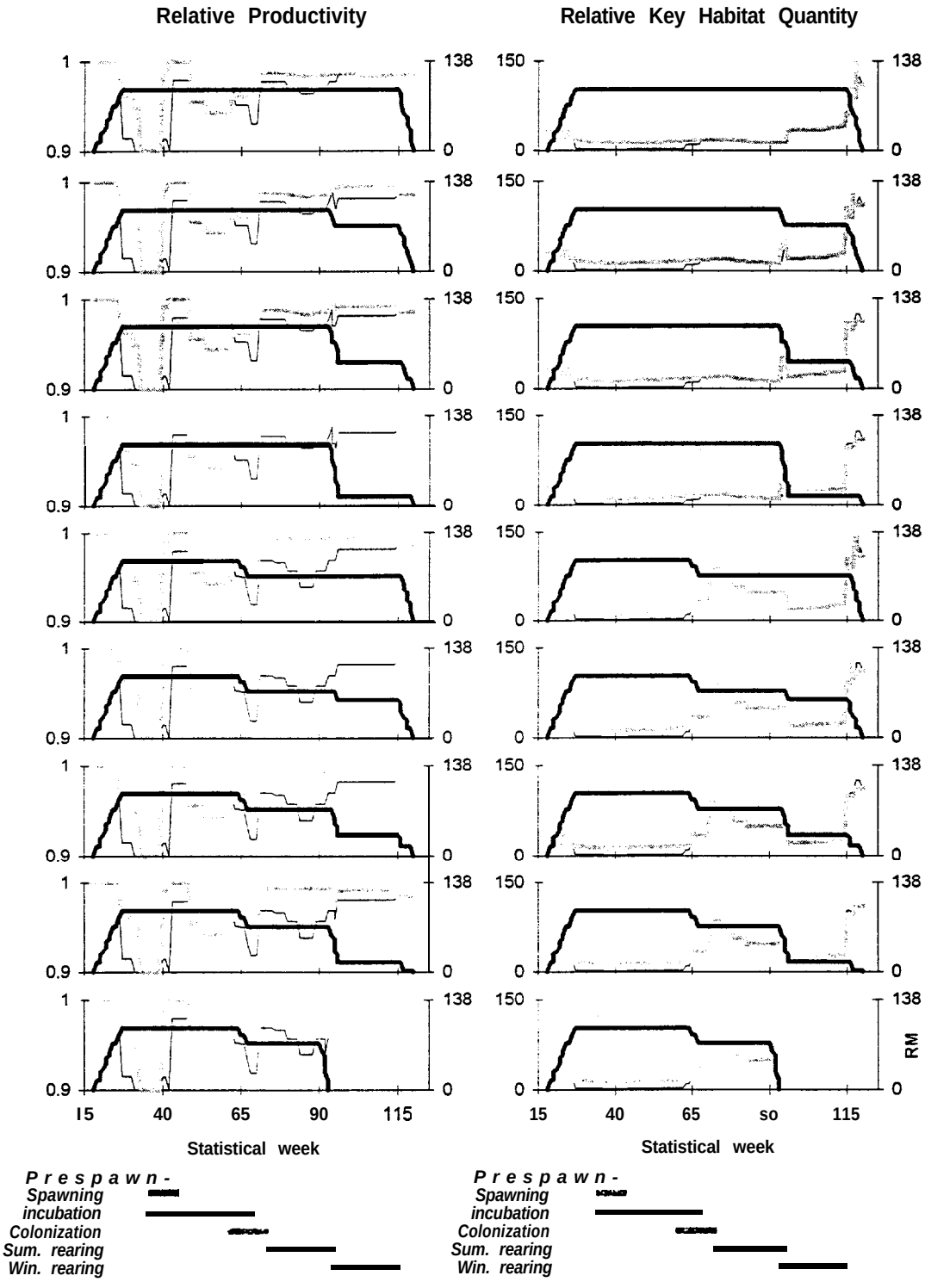


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
186	0.18
148	0.14
Traj. #2	
332	0.36
232	0.24
Traj. #3	
311	0.34
219	0.24
Traj. #4	
281	0.30
216	0.23
Traj. #5	
286	0.37
61	0.07
Traj. #6	
342	0.47
89	0.10
Traj . #7	
341	0.46
73	0.08
Traj. #8	
322	0.44
73	0.08
Traj. #9	
575	0.84
169	0.20

Trajectory
Template
Patient

Spawning reach: Minam R.

Mouth - Cougar Cr (RM 89.5 - 99.4 from Snake R)

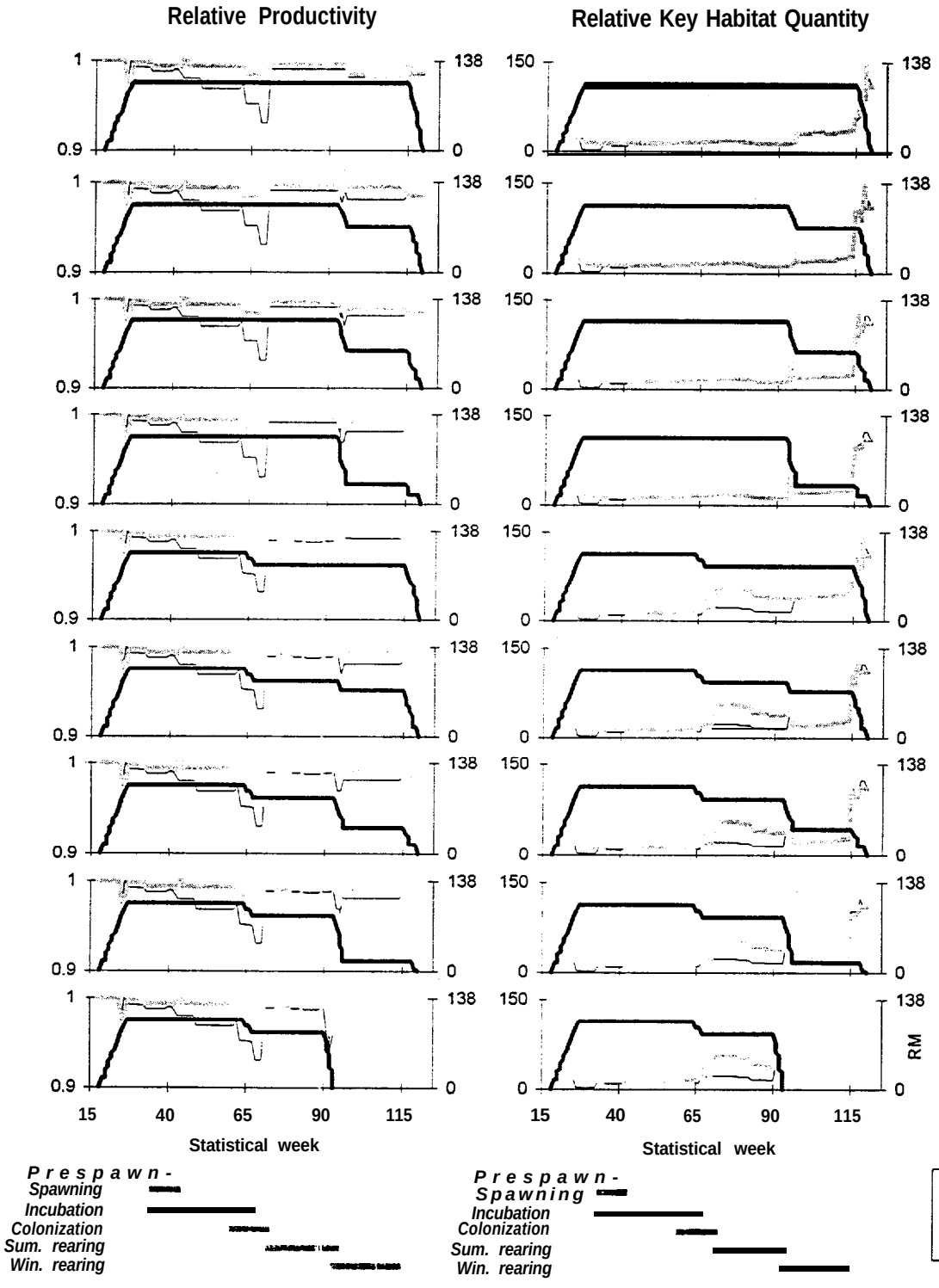


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
31	0.12
1	0.00
Traj. #2	
37	0.15
1	0.00
Traj. #3	
35	0.14
1	0.00
Traj. #4	
35	0.14
1	0.00
Traj. #5	
42	0.17
1	0.00
Traj. #6	
38	0.16
1	0.00
Traj. #7	
40	0.16
1	0.00
Traj. #8	
39	0.16
1	0.00
Traj. #9	
71	0.29
2	0.00

Trajectory
Template
Patient

Spawning reach: Minam R.

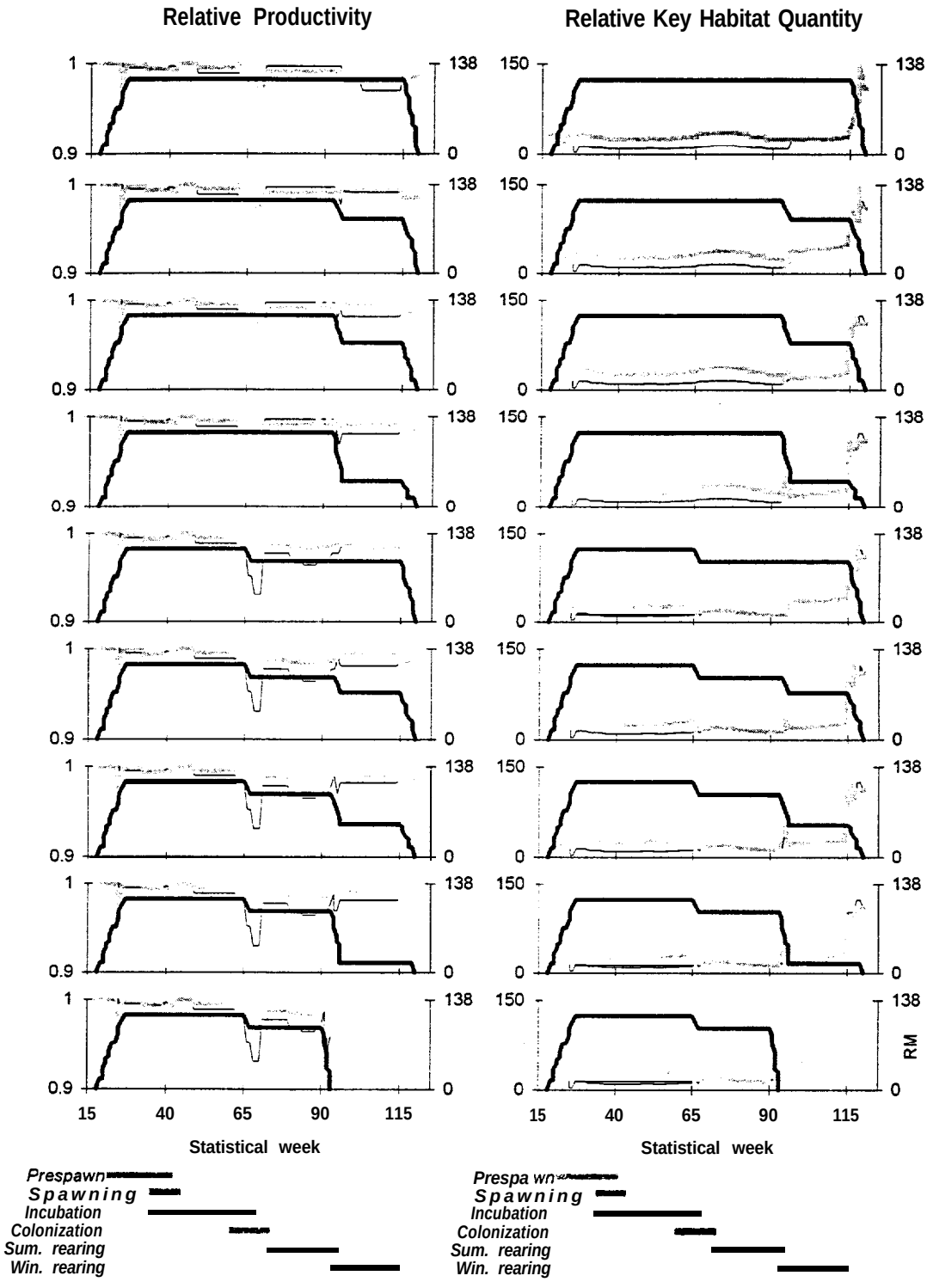
Cougar Cr - Little Minam R (RM 99.4 - 108.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
320	0.76
122	0.11
Traj. #2	
400	0.93
122	0.11
Traj. #3	
363	0.85
121	0.11
Traj. #4	
380	0.89
120	0.11
Traj. #5	
317	0.95
141	0.13
Traj. #6	
318	0.91
114	0.11
Traj. #7	
301	0.88
112	0.10
Traj. #8	
299	0.87
111	0.10
Traj. #9	
538	1.73
235	0.22

Spawning reach: Minam R.

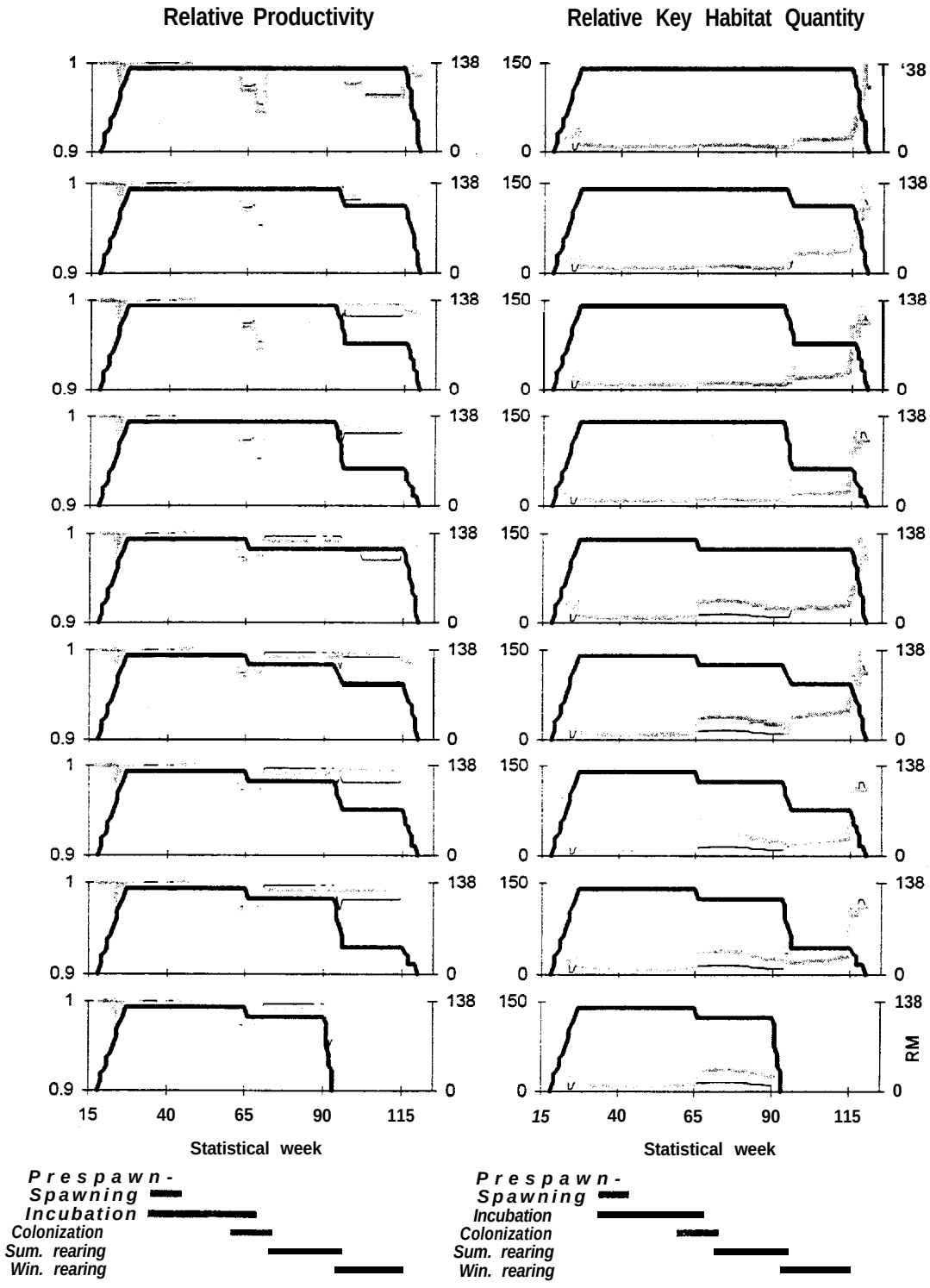
Little Minam R - splash dam site (1 m above Garwood Cr; RM 108.4 - 119.7 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
314	1.16
278	0.49
Traj. #2	
395	1.47
377	0.68
Traj. #3	
395	1.40
312	0.55
Traj. #4	
374	1.35
307	0.55
Traj. #5	
272	0.86
153	0.32
Traj. #6	
324	1.00
144	0.30
Traj. #7	
294	0.93
142	0.30
Traj. #8	
308	0.96
140	0.29
Traj. #9	
562	2.04
312	0.69

Spawning reach: Minam R.

Splash dam site - falls (RM 119.7 - 138.0 from Snake R)

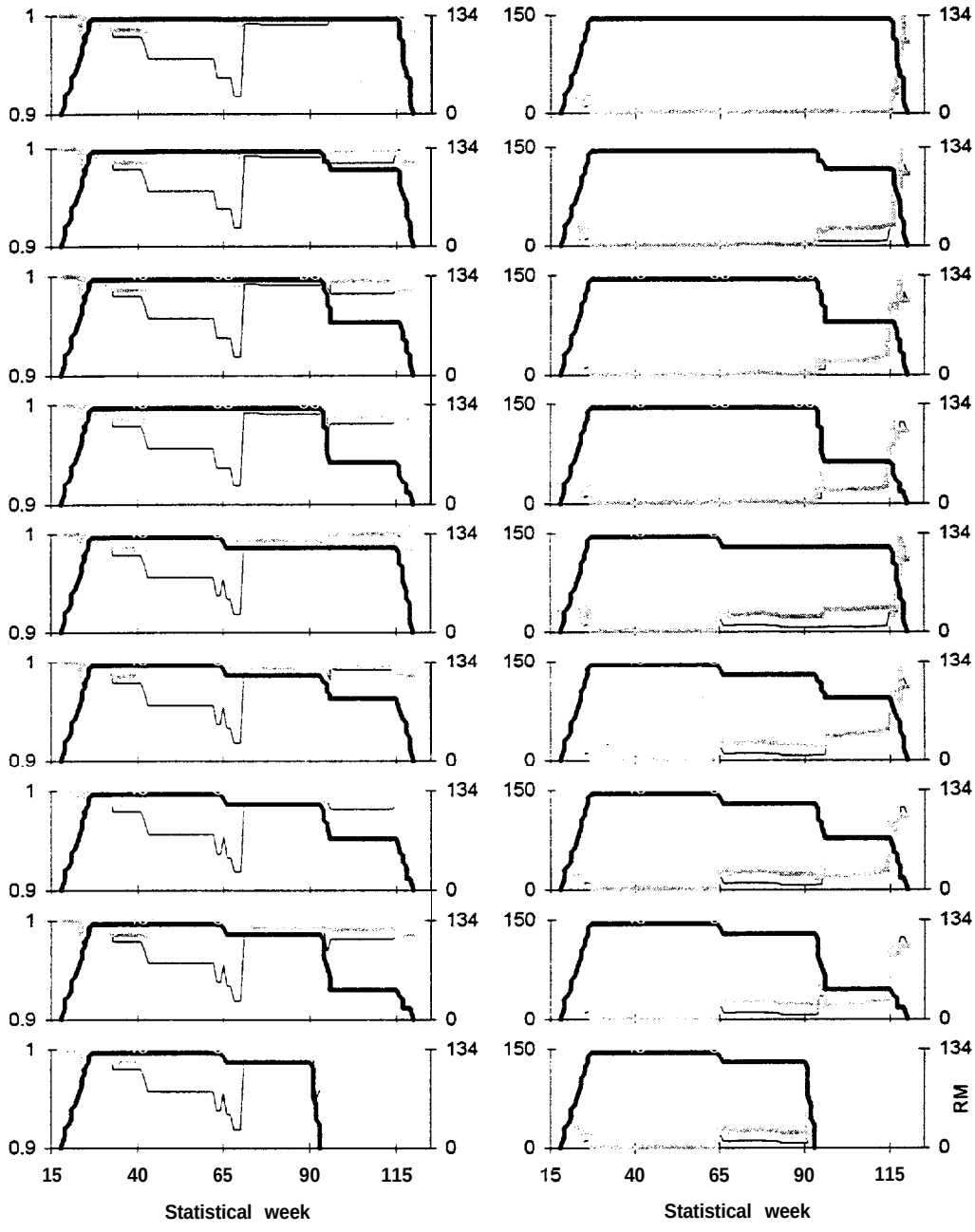


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
211	0.40
268	0.39
Traj. #2	
279	0.53
327	0.48
Traj. #3	
352	0.66
331	0.48
Traj. #4	
318	0.60
327	0.47
Traj. #5	
293	0.70
315	0.48
Traj. #6	
369	0.89
426	0.66
Traj. #7	
369	0.86
353	0.53
Traj. #8	
349	0.83
346	0.53
Traj. #9	
627	1.65
713	1.20

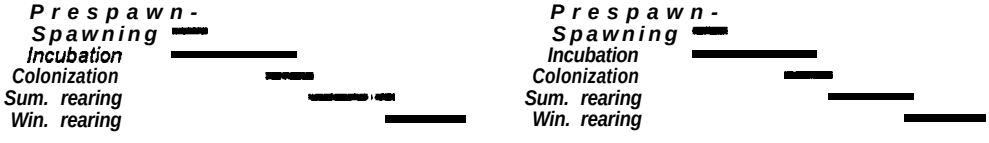
Trajectory
Template Patient

Spawning reach: Prairie Cr.

Mouth - OK Gulch confluence (RM 126.8 - 131.8 from Snake R)



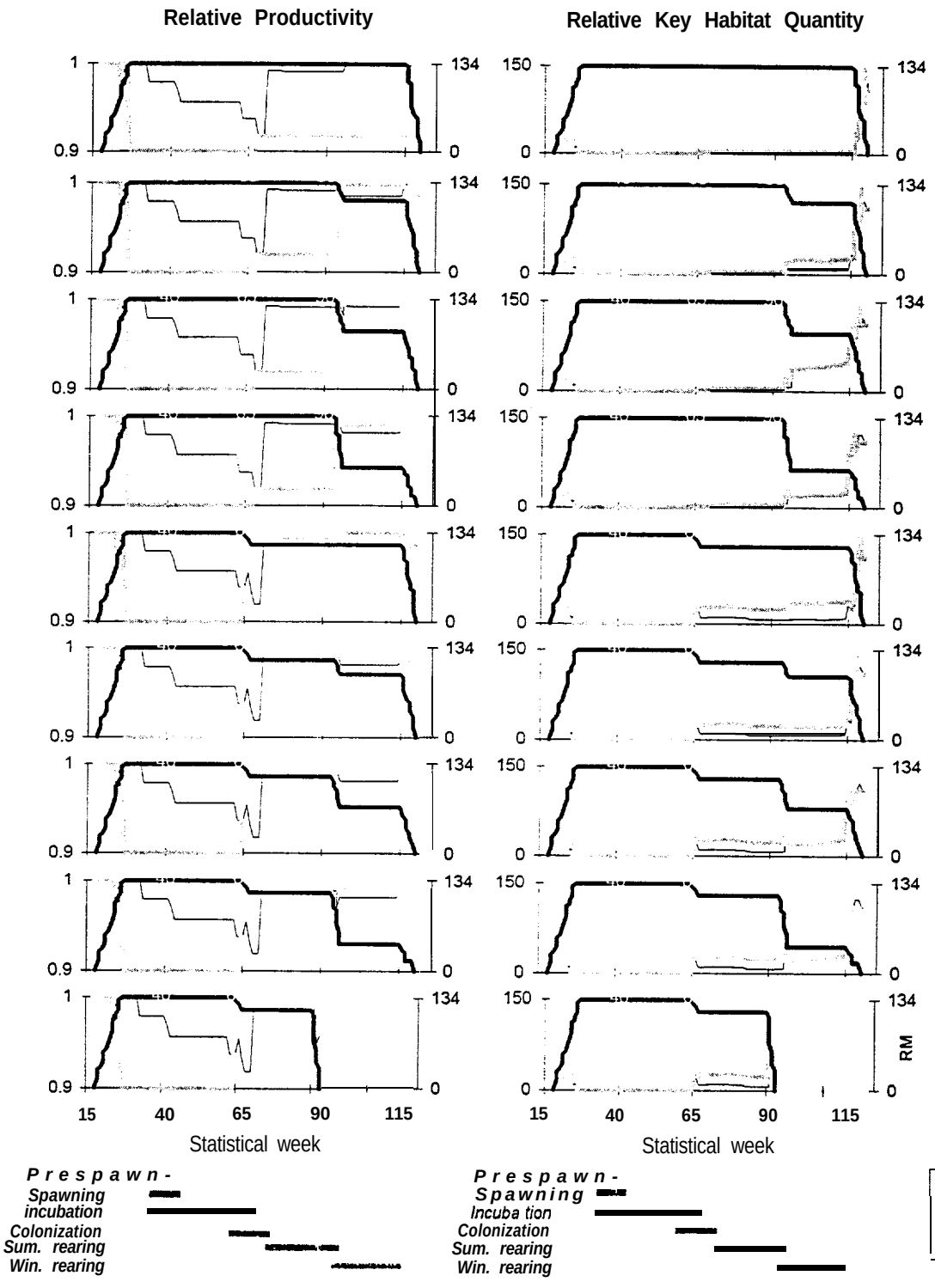
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
508	0.11
105	0.09
Traj. #2	
499	0.14
80	0.07
Traj. #3	
467	0.13
73	0.07
Traj. #4	
422	0.12
73	0.07
Traj. #5	
476	0.17
81	0.08
Traj. #6	
422	0.15
90	0.09
Traj. #7	
421	0.15
74	0.08
Traj. #8	
398	0.14
72	0.08
Traj. #9	
713	0.26
152	0.16



Trajectory
Template
Patient

Spawning reach: Prairie Cr.

OK Gulch fork (RM 131.8 - 133.8 from Snake R)

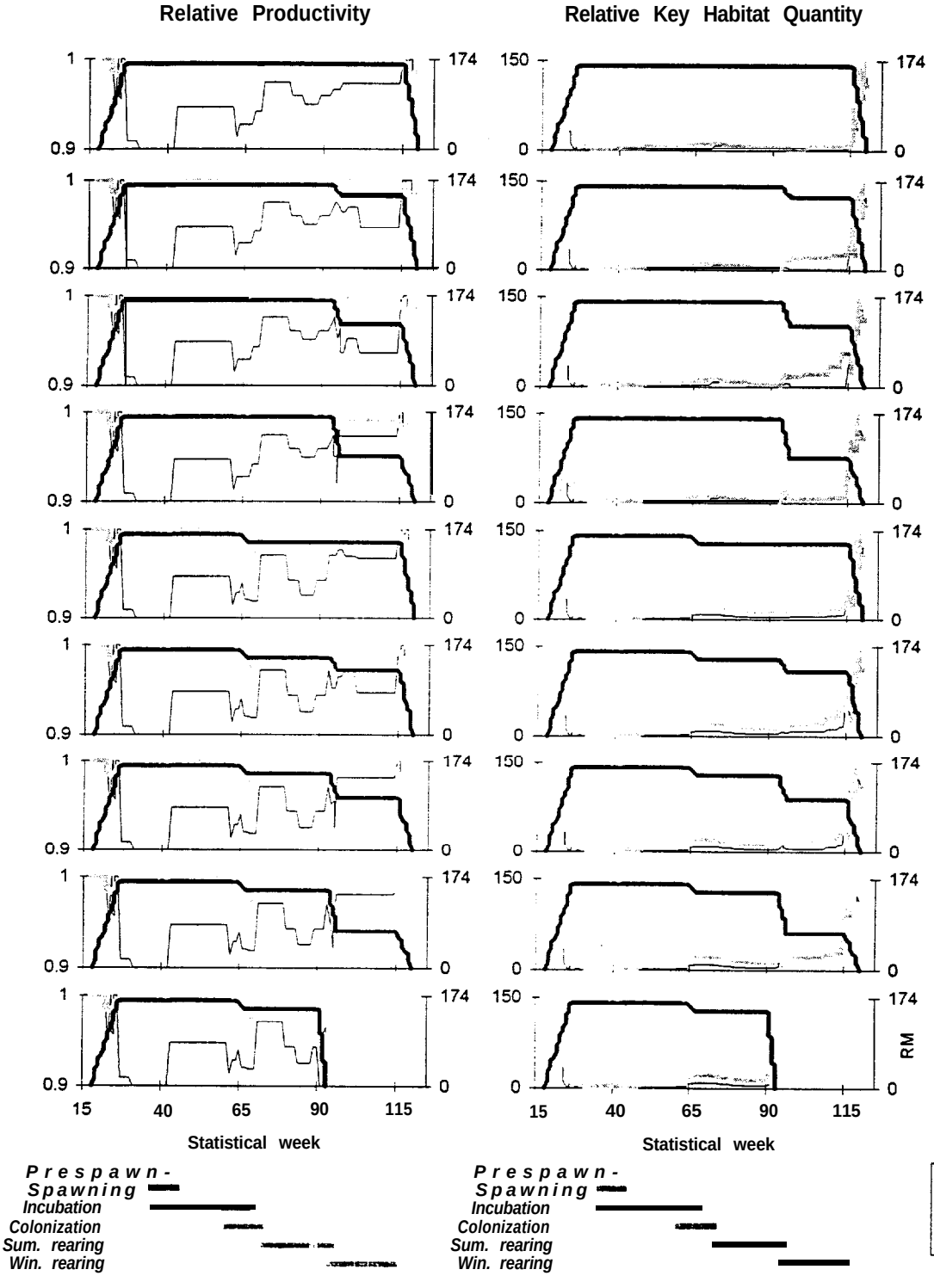


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
0	0.00
106	0.01
Traj. #2	
0	0.00
80	0.01
Traj. #3	
0	0.00
89	0.01
Traj. #4	
0	0.00
73	0.01
Traj. #5	
0	0.00
81	0.01
Traj. #6	
0	0.00
75	0.01
Traj. #7	
0	0.00
74	0.01
Traj. #8	
0	0.00
73	0.01
Traj. #9	
0	0.00
153	0.02

Trajectory1
Template Patient

Spawning reach: Sheep Cr.

Mouth - Chicken Cr (RM 164.2 - 165.7 from Snake R)

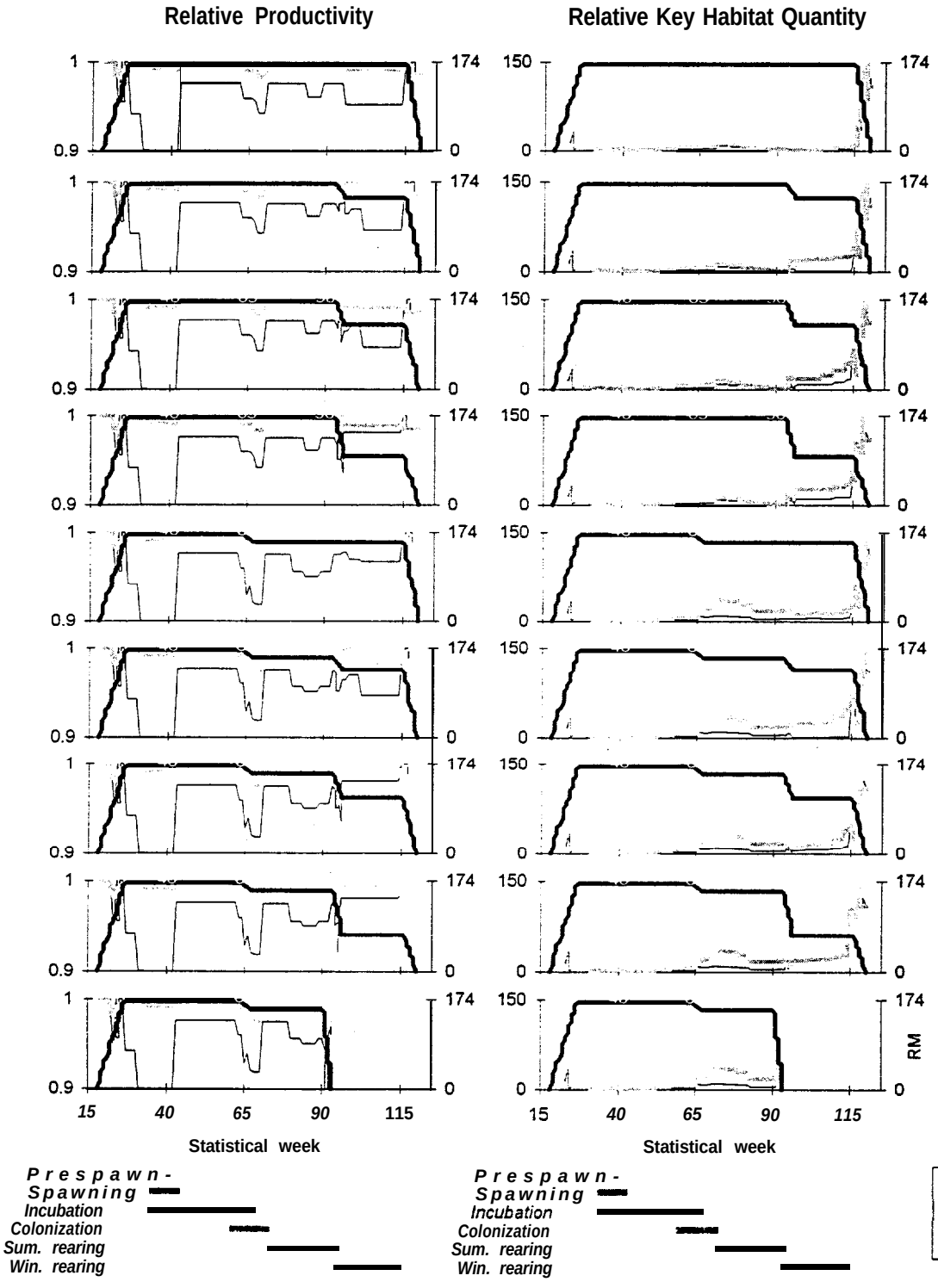


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #I	
485	0.39
1	0.00
Traj. #2	
443	0.44
1	0.00
Traj. #3	
517	0.51
0	0.00
Traj. #4	
466	0.43
1	0.00
Traj. #5	
380	0.47
0	0.00
Traj. #6	
378	0.48
0	0.00
Traj. #7	
374	0.47
1	0.00
Traj. #8	
390	0.50
1	0.00
Traj. #9	
671	0.92
1	0.00

Trajectory
Template
Patient

Spawning reach: Sheep Cr.

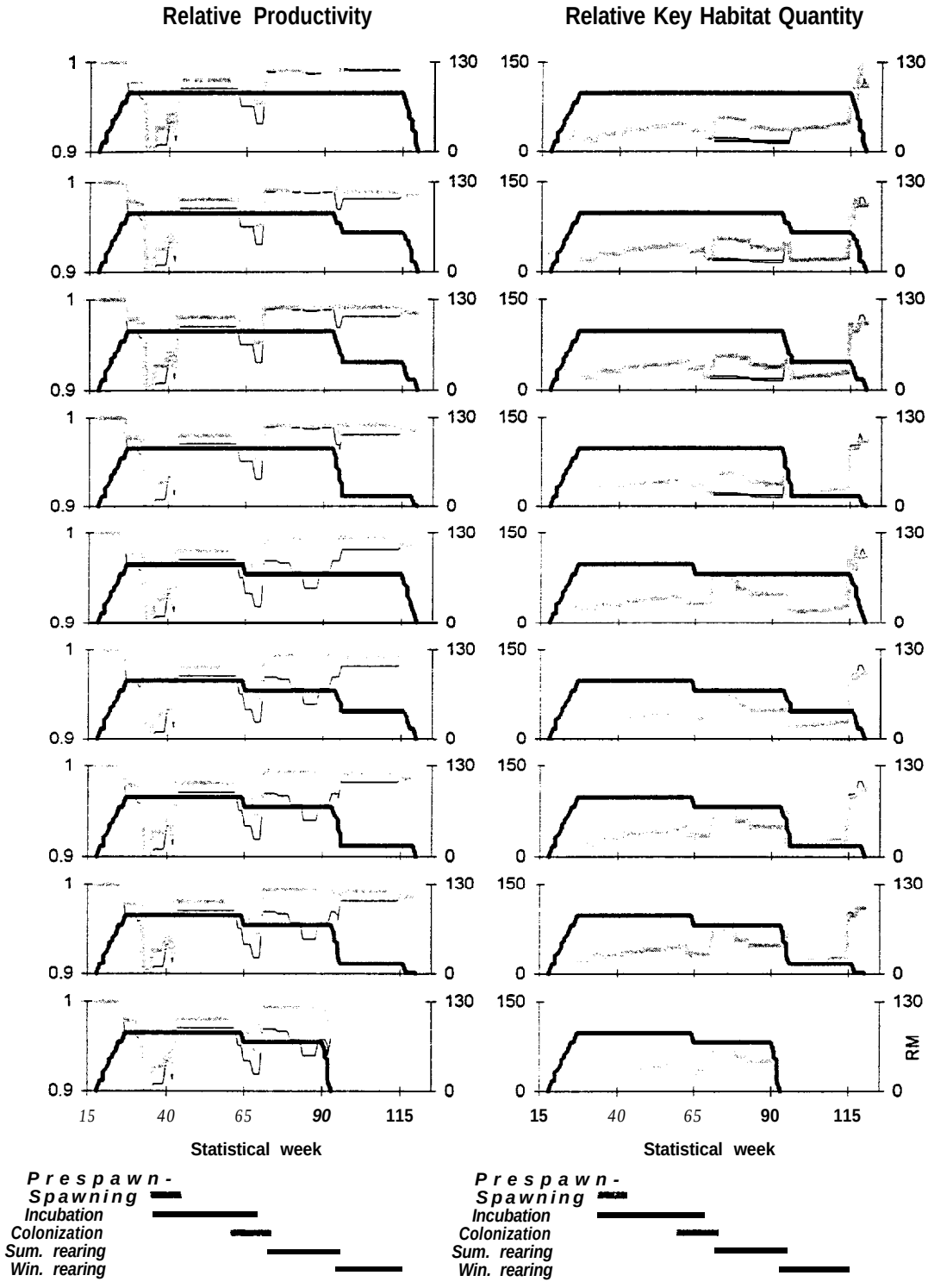
Chicken Cr - headwaters (RM 165.7 - 173.7 from Snake R)



Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1		
Traj. #2	426	0.38
	8	0.01
Traj. #3	455	0.40
	8	0.01
Traj. #4	428	0.38
	13	0.01
Traj. #5		
Traj. #6	358	0.46
	5	0.00
Traj. #7	397	0.49
	9	0.01
Traj. #8		
Traj. #9	678	0.92
	16	0.01

Spawning reach: Wallowa R.

Mouth - Minam R (RM 80.0 - 89.8 from Snake R)

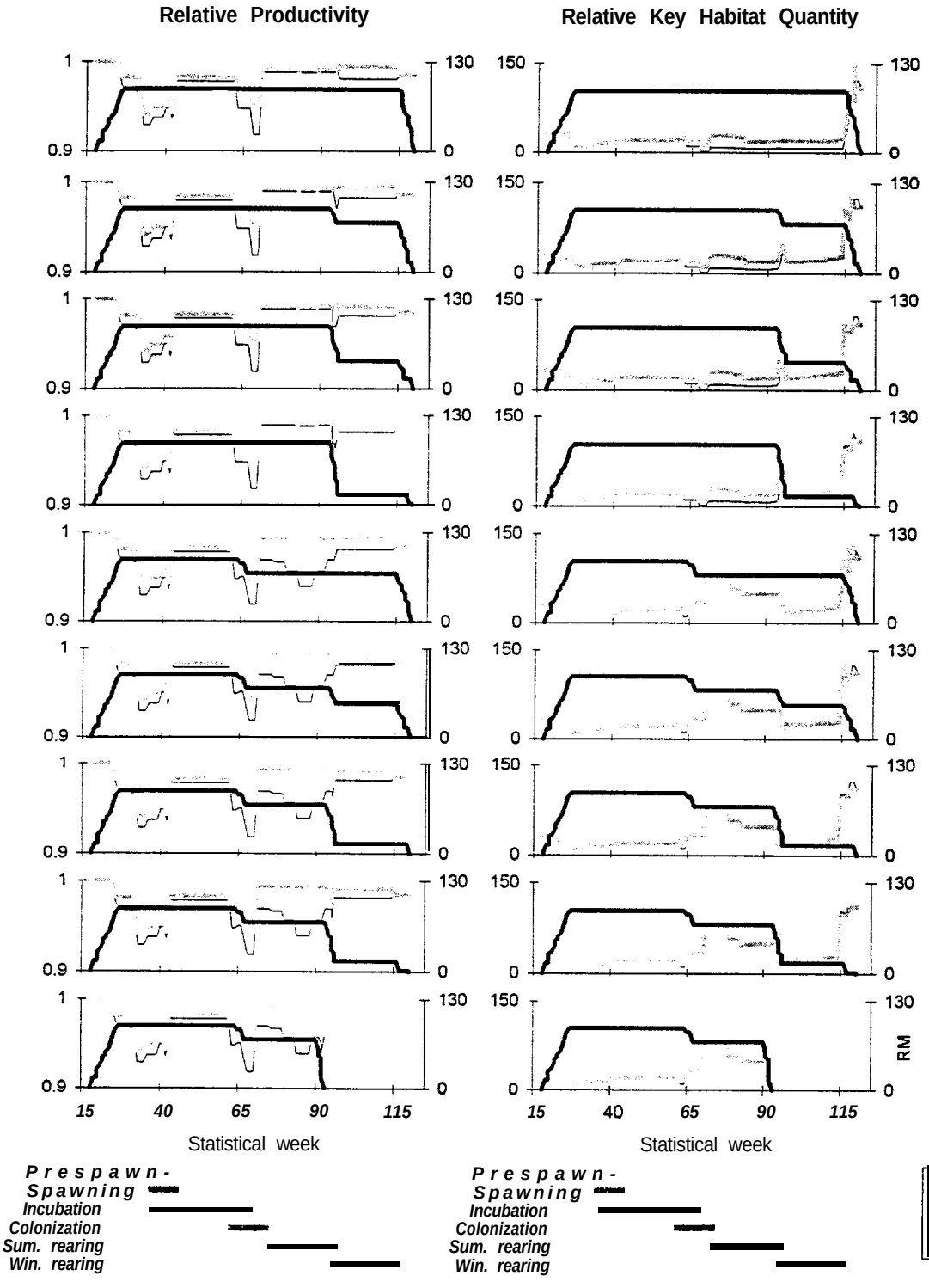


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
101	0.42
47	0.21
Traj. #2	
91	0.38
37	0.16
Traj. #3	
95	0.39
37	0.16
Traj. #4	
94	0.39
37	0.16
Traj. #5	
104	0.44
16	0.08
Traj. #6	
98	0.41
16	0.08
Traj. #7	
97	0.41
16	0.08
Traj. #8	
96	0.41
16	0.08
Traj. #9	
172	0.76
37	0.17

Trajectory
Template
Patient

Spawning reach: Wallowa R.

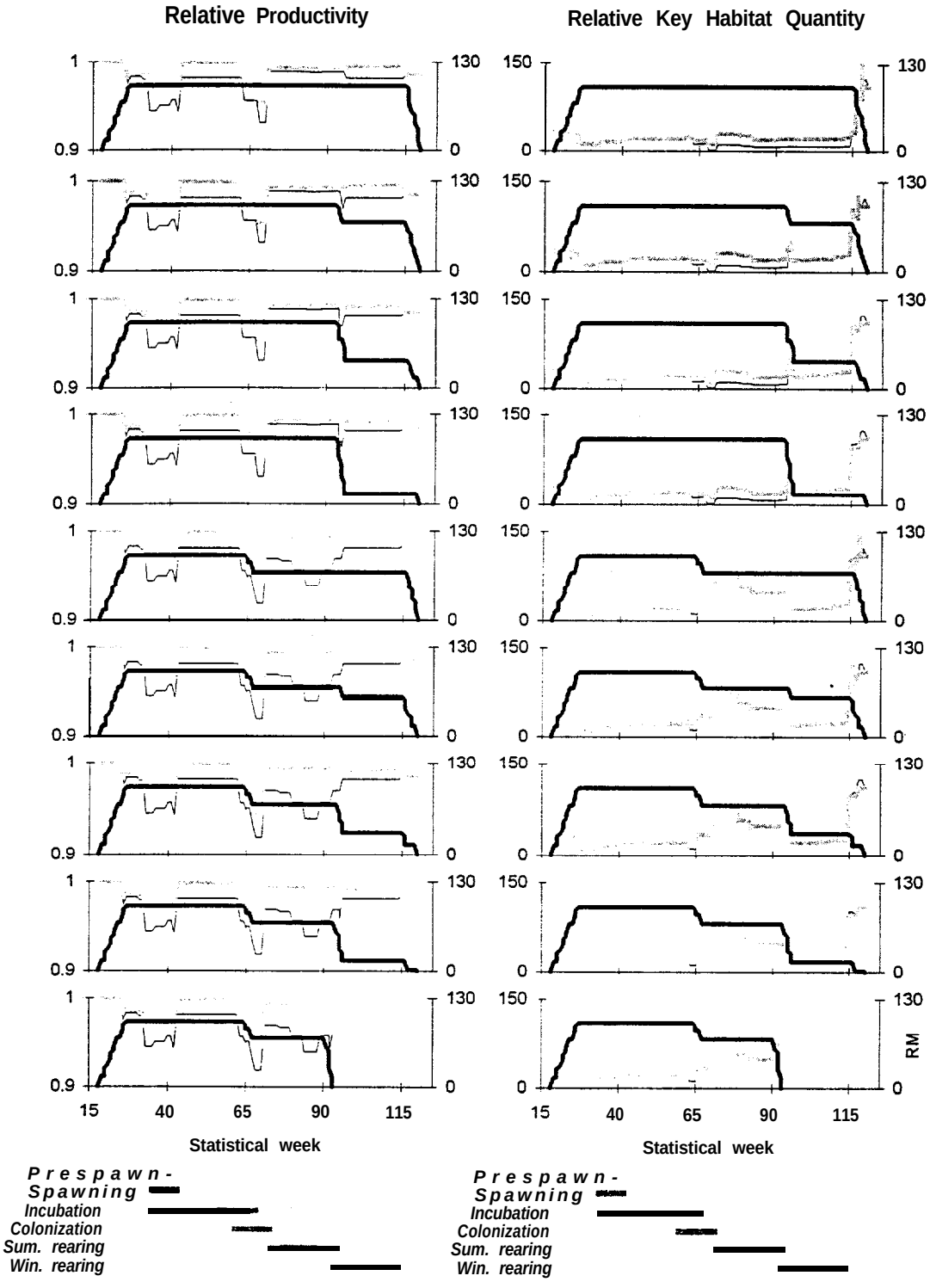
Minam R - Deer Cr (RM 89.8 - 90.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
142	0.36
63	0.13
Traj. #2	
143	0.37
62	0.13
Traj. #3	
135	0.35
61	0.13
Traj. #4	
134	0.35
61	0.13
Traj. #5	
147	0.40
29	0.08
Traj. #6	
133	0.37
29	0.08
Traj. #7	
137	0.38
29	0.08
Traj. #8	
137	0.38
29	0.08
Traj. #9	
245	0.70
66	0.18

Spawning reach: Wallowa R.

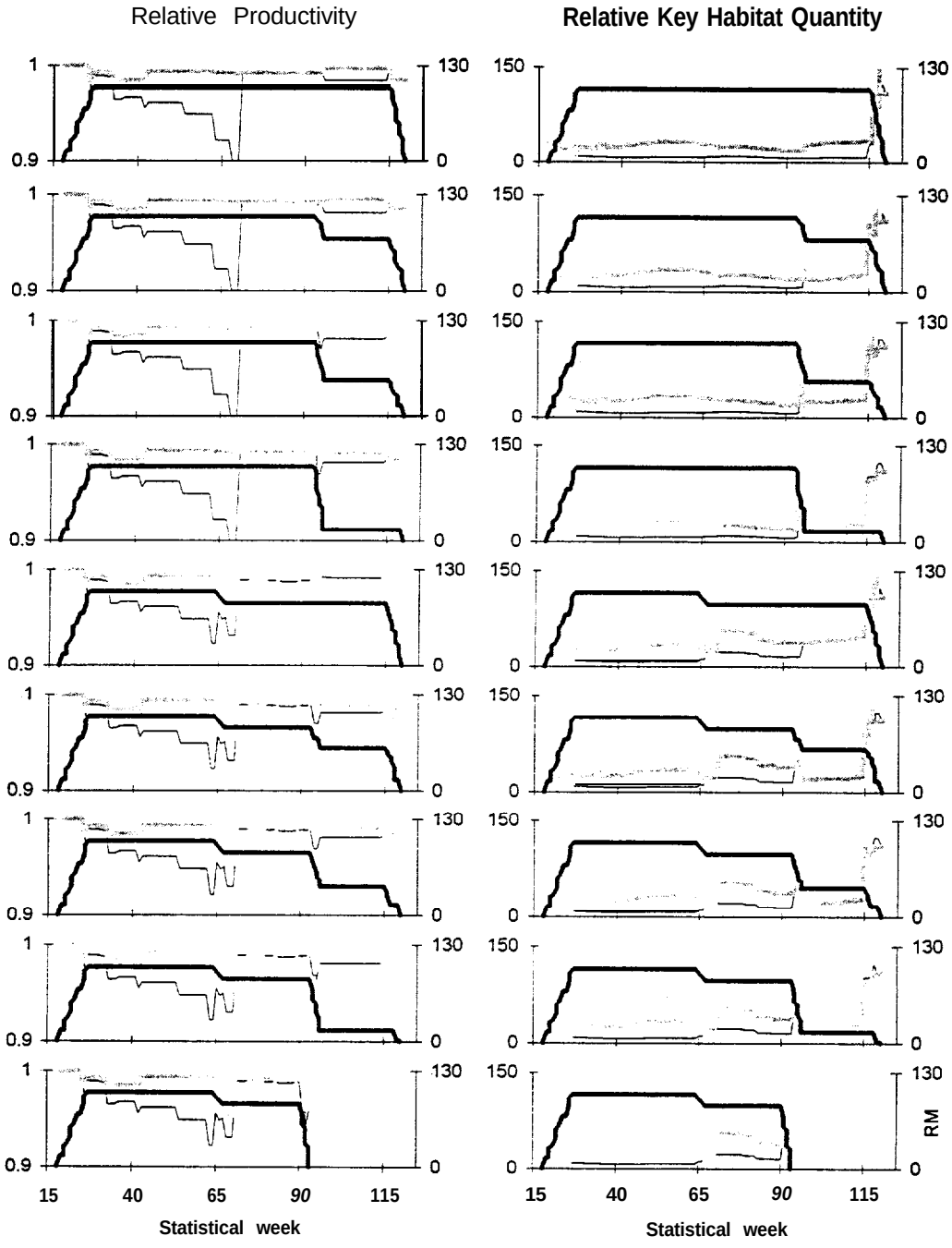
Deer Cr - Dry Cr (RM 90.8 - 98.3 from Snake R)



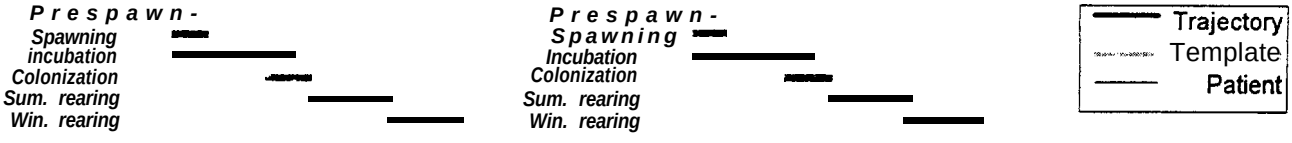
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
270	0.61
89	0.18
Traj. #2	
270	0.62
88	0.18
Traj. #3	
255	0.59
87	0.18
Traj. #4	
254	0.58
86	0.18
Traj. #5	
265	0.68
39	0.11
Traj. #6	
239	0.61
39	0.11
Traj. #7	
249	0.64
39	0.11
Traj. #8	
246	0.64
38	0.10
Traj. #9	
442	1.23
88	0.24

Spawning reach: Wallowa R.

Dry Cr - Bear Cr (RM 98.3 - 101.8 from Snake R)

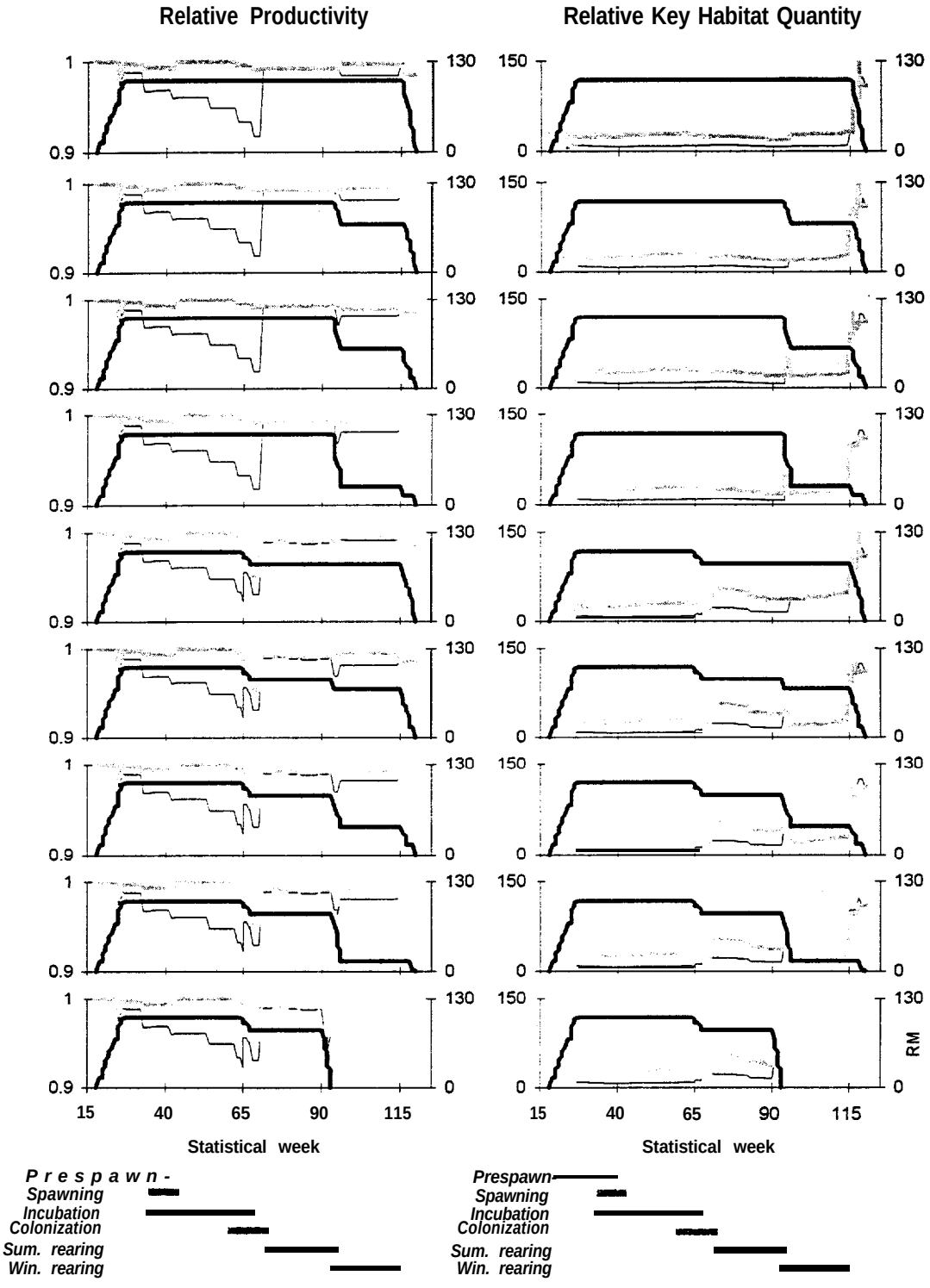


Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
394	1.24
56	0.14
Traj. #2	
369	1.14
52	0.13
Traj. #3	
" : : I	
Traj. #4	
349	1.09
50	0.12
Traj. #5	
295	1.10
73	0.19
Traj. #6	
267	0.95
58	0.15
Traj. #7	
280	1.00
58	0.15
Traj. #8	
276	0.99
57	0.15
Traj. #9	
499	2.02
121	0.32



Spawning reach: Wallowa R.

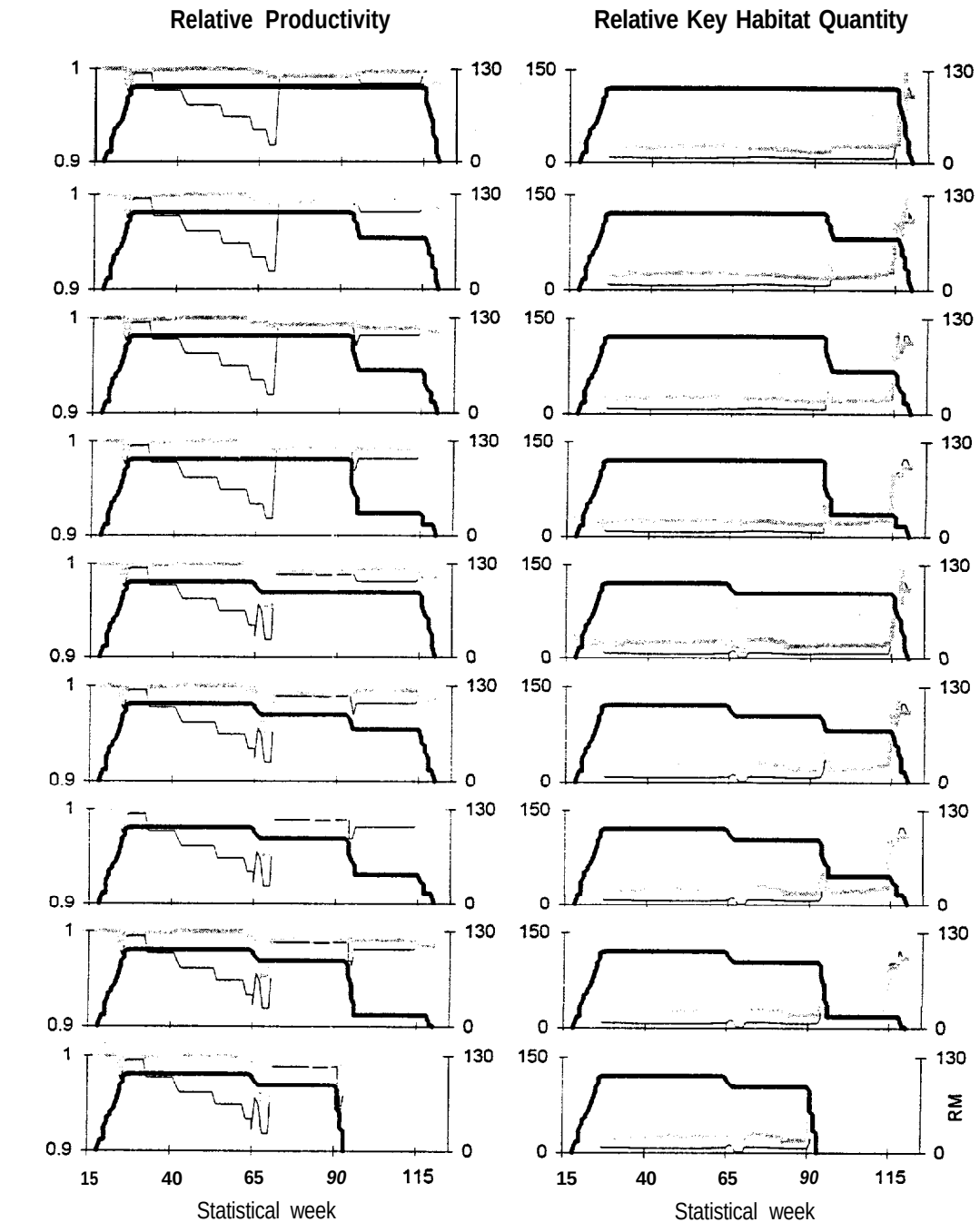
Bear Cr - Whiskey Cr (RM 101.8 - 103.9 from Snake R)



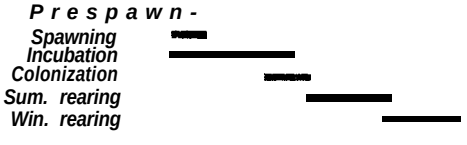
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
510	1.43
67	0.15
Traj. #2	
477	1.32
61	0.14
Traj. #3	
431	1.20
60	0.14
Traj. #4	
451	1.27
59	0.14
Traj. #5	
382	1.32
77	0.19
Traj. #6	
384	1.25
61	0.15
Traj. #7	
363	1.20
61	0.15
Traj. #8	
360	1.18
60	0.15
Traj. #9	
648	2.47
127	0.32

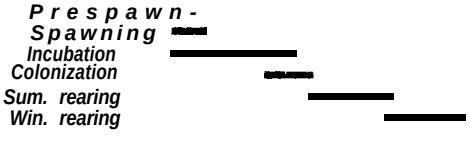
Spawning reach: Wallowa R.

Whiskey Cr - Lostine R (RM 103.9 - 105.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
536	1.41
74	0.16
Traj. #2	
501	1.31
68	0.15
Traj. #3	
453	1.19
66	0.15
Traj. #4	
474	1.26
66	0.15
Traj. #5	
407	1.09
66	0.13
Traj. #6	
409	1.11
65	0.13
Traj. #7	
386	1.06
64	0.13
Traj. #8	
383	1.05
64	0.13
Traj. #9	
690	2.18
134	0.27

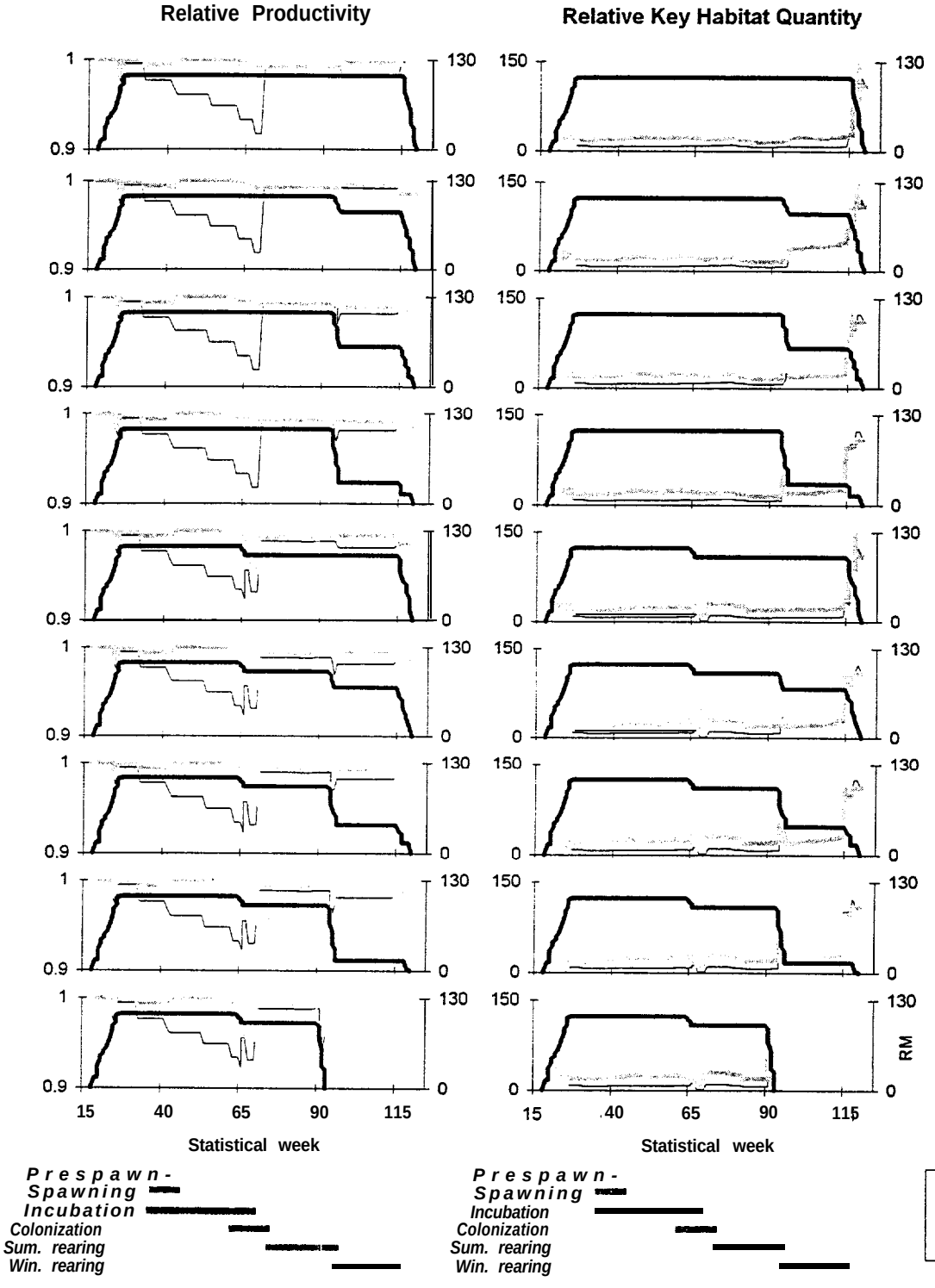




Trajectory
Template
Patient

Spawning reach: Wallowa R.

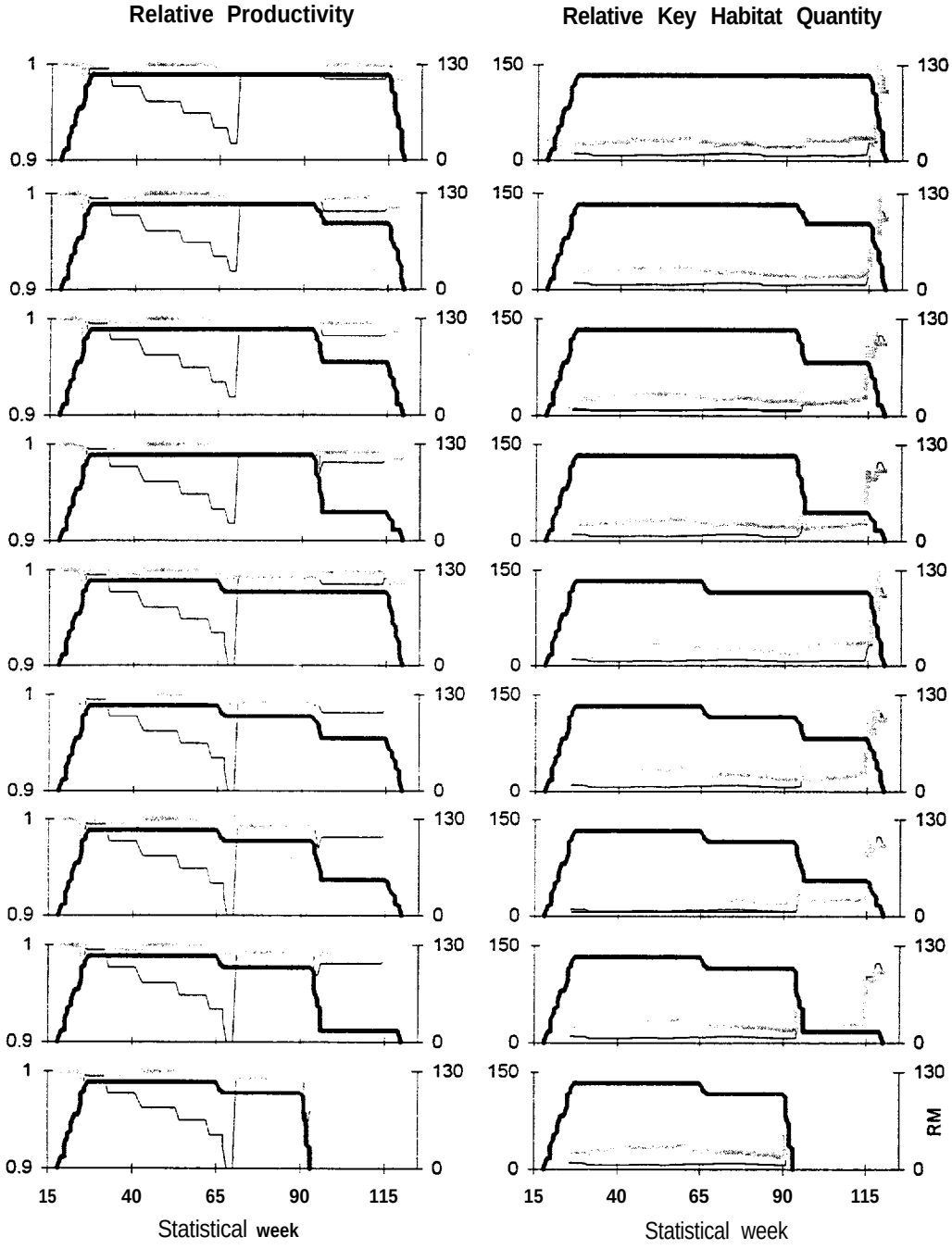
Lostine R - Parsnip Cr (RM 105.8 - 109.0 from Snake R)

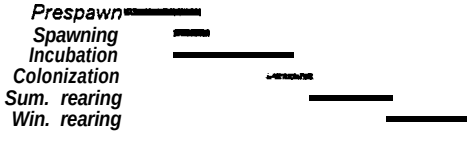


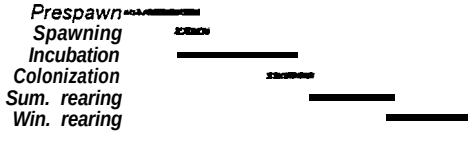
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
506	1.20
74	0.16
Traj. #2	
473	1.20
83	0.19
Traj. #3	
427	1.03
67	0.15
Traj. #4	
447	1.09
67	0.15
Traj. #5	
402	1.02
69	0.14
Traj. #6	
402	1.04
68	0.14
Traj. #7	
380	1.00
67	0.14
Traj. #8	
378	0.98
67	0.14
Traj. #9	
680	2.03
141	0.30

Spawning reach: Wallowa R.

Parsnip Cr - Hurricane Cr (RM 109.0 - 121.9 from Snake R)





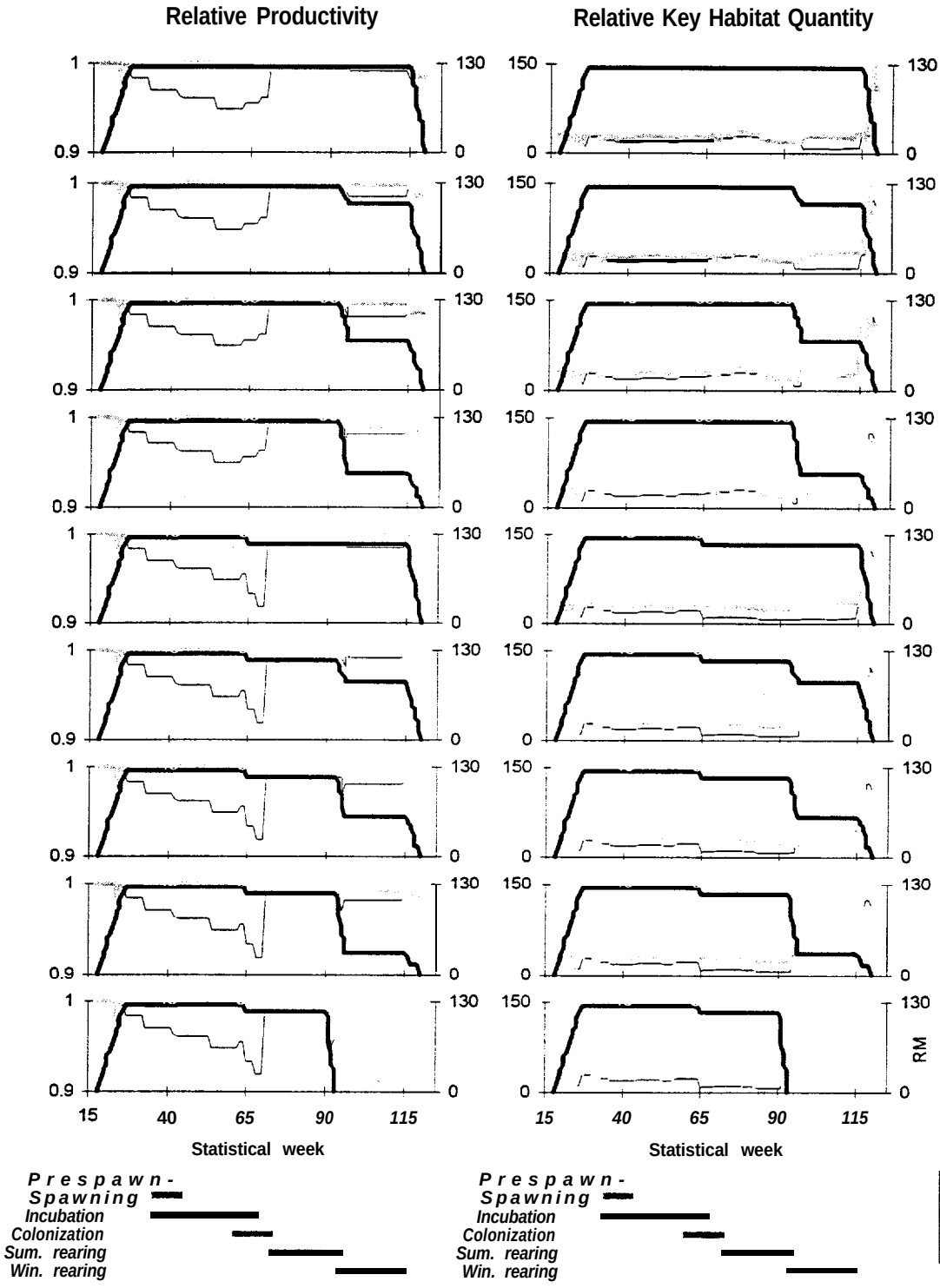


Trajectory
Template
Patient

Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
539	1.60
75	0.17
Traj. #2	
478	1.35
69	0.15
Traj. #3	
477	1.38
69	0.16
Traj. #4	
451	1.33
68	0.15
Traj. #5	
508	1.48
69	0.15
Traj. #6	
476	1.35
63	0.14
Traj. #7	
431	1.26
62	0.14
Traj. #8	
450	1.30
61	0.14
Traj. #9	
805	2.79
129	0.30

Spawning reach: Wallowa R.

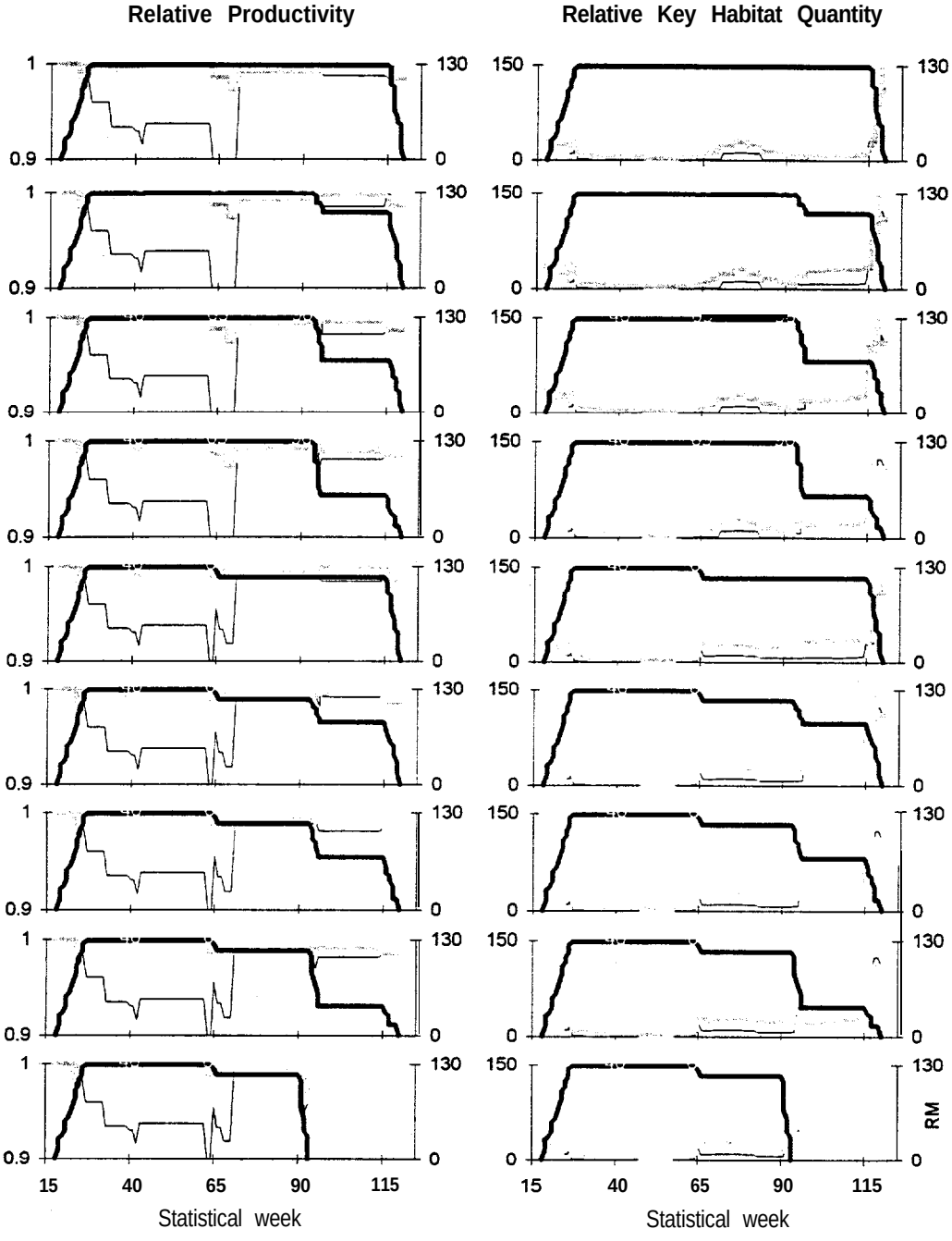
Hurricane Cr - Lower Alderslope Ditch (RM 121.9 - 126.8 from Snake R)



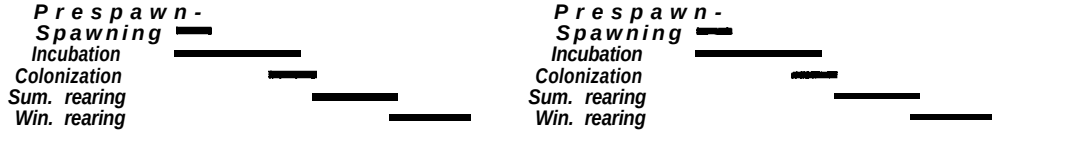
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
509	1.51
100	0.35
Traj. #2	
504	1.53
88	0.31
Traj. #3	
473	1.39
82	0.30
Traj. #4	
427	1.30
80	0.30
Traj. #5	
532	1.62
68	0.23
Traj. #6	
472	1.48
75	0.26
Traj. #7	
427	1.26
61	0.21
Traj. #8	
446	1.34
61	0.21
Traj. #9	
799	2.88
127	0.47

Spawning reach: Wallowa R.

Lower Alderslope Ditch - Wallowa Lake (RM 126.8 - 130.8 from Snake R)



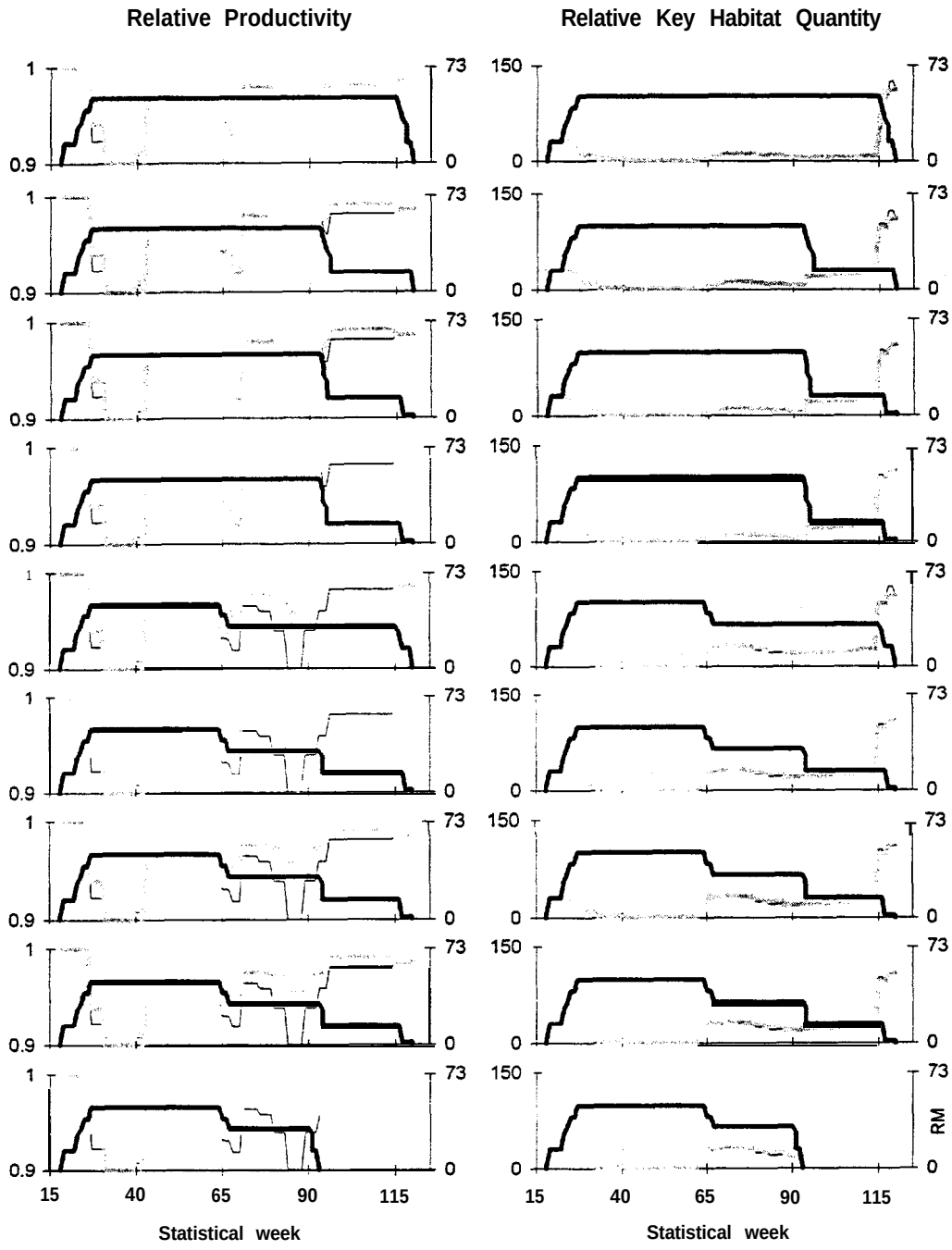
Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
465	0.70
19	0.00
Traj. #2	
459	0.81
18	0.00
Traj. #3	
430	0.75
16	0.00
Traj. #4	
388	0.68
16	0.00
Traj. #5	
527	0.99
25	0.00
Traj. #6	
467	0.89
27	0.00
Traj. #7	
466	0.86
23	0.00
Traj. #8	
440	0.83
22	0.00
Traj. #9	
789	1.65
46	0.01



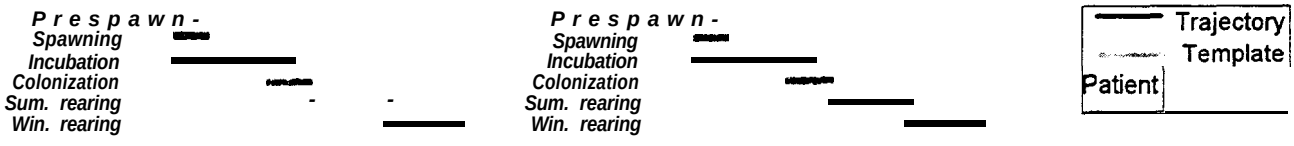
Trajectory
Template
Patient

Spawning reach: Wenaha R.

Mouth - Crooked Cr (RM 45.1 - 51.8 from Snake R)

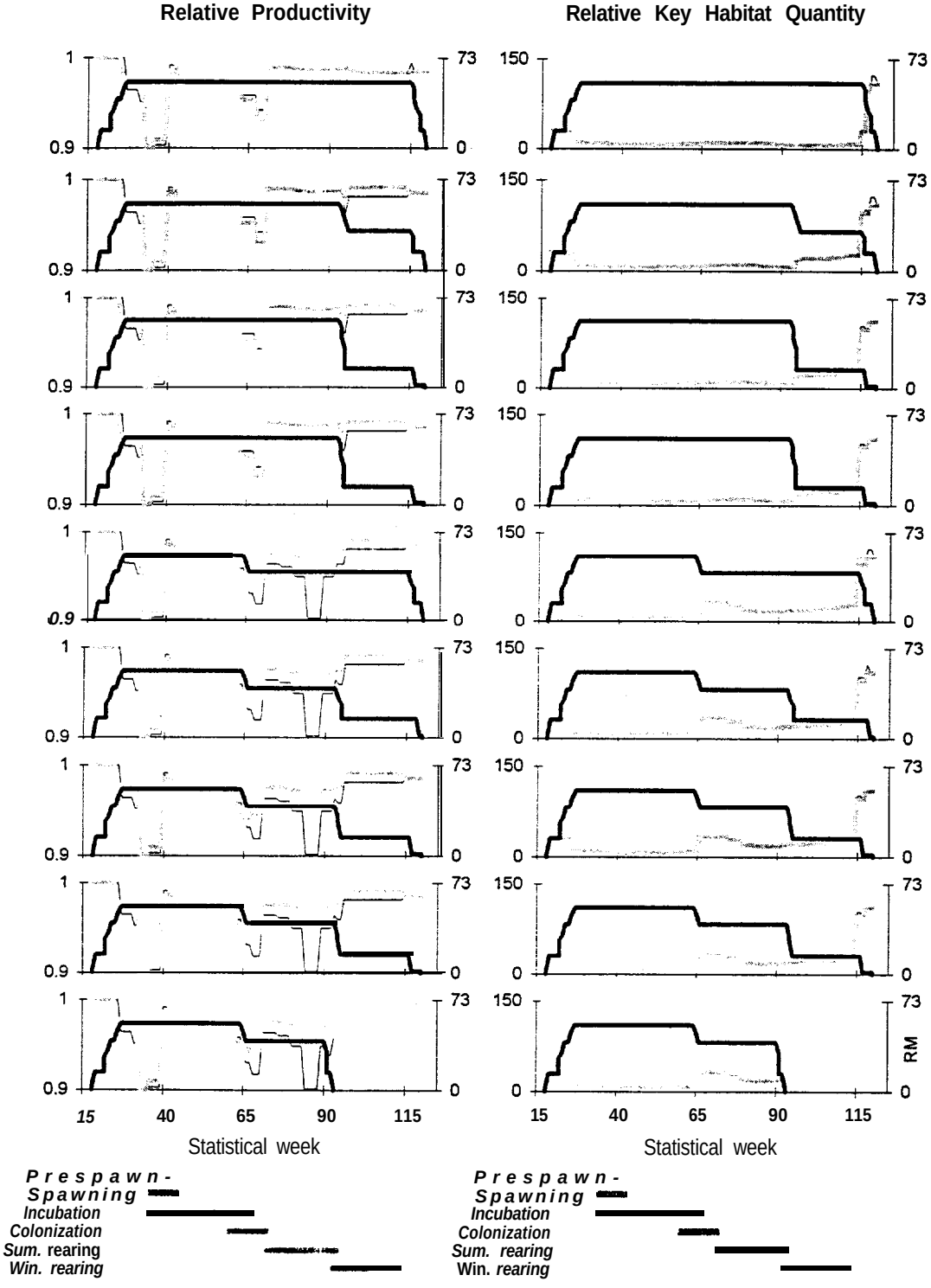


Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	1	0.00
	1	0.00
Traj. #2	1	0.00
	1	0.00
Traj. #3	1	0.00
	1	0.00
Traj. #4	1	0.00
	1	0.00
Traj. #5	1	0.00
	0	0.00
Traj. #6	1	0.00
	0	0.00
Traj. #7	1	0.00
	0	0.00
Traj. #8	1	0.00
	0	0.00
Traj. #9	2	0.01
	1	0.00



Spawning reach: Wenaha R.

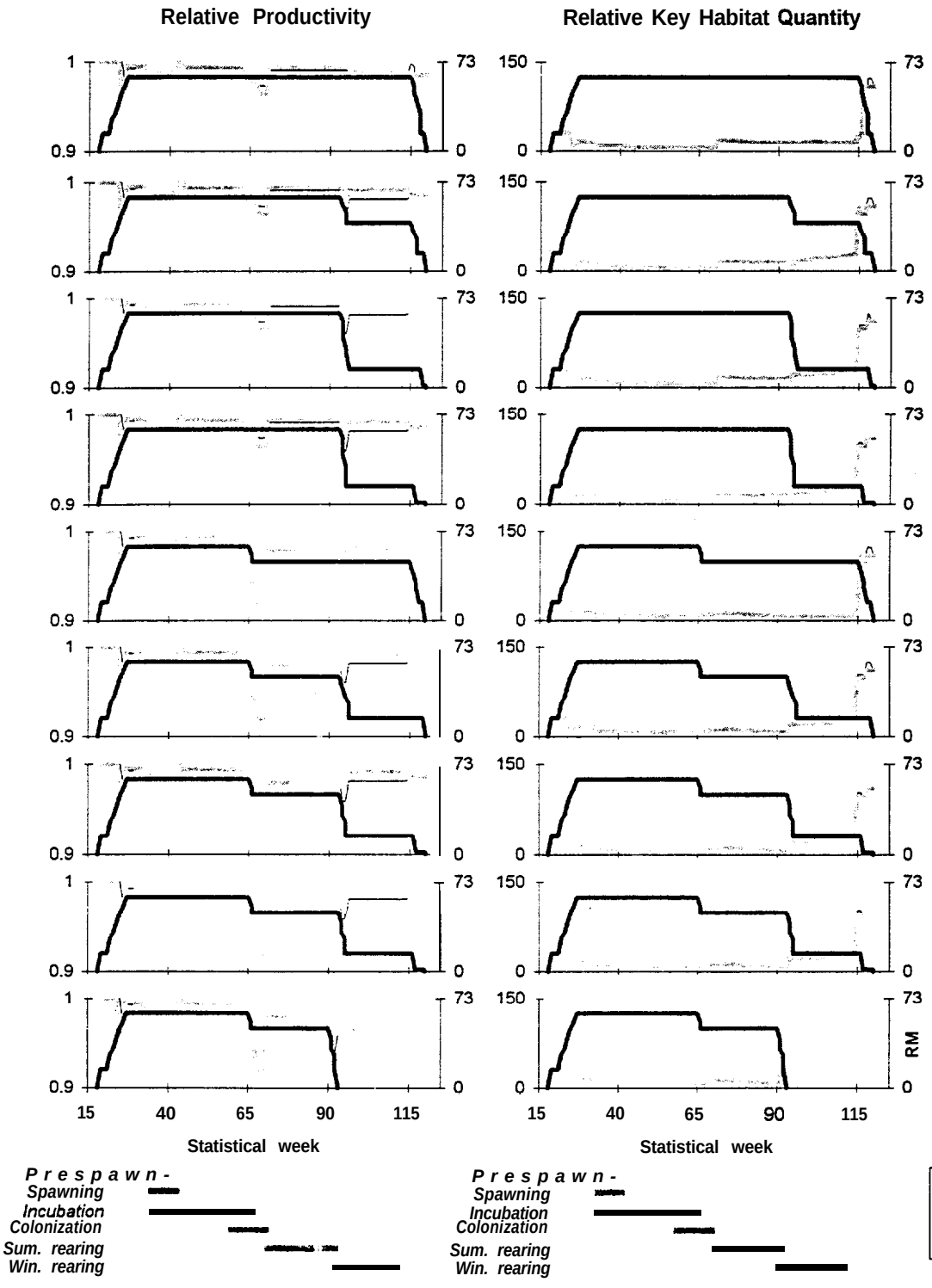
Crooked Cr - Fairview Cr (RM 51.8 - 55.3 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
61	0.15
58	0.15
Traj. #2	
67	0.17
52	0.14
Traj. #3	
67	0.17
51	0.13
Traj. #4	
67	0.17
51	0.13
Traj. #5	
44	0.12
16	0.05
Traj. #6	
44	0.12
16	0.05
Traj. #7	
44	0.12
16	0.05
Traj. #8	
44	0.12
16	0.05
Traj. #9	
84	0.24
36	0.11

Spawning reach: Wenaha R.

Fairview Cr - forks (RM 55.3 - 65.9 from Snake R)

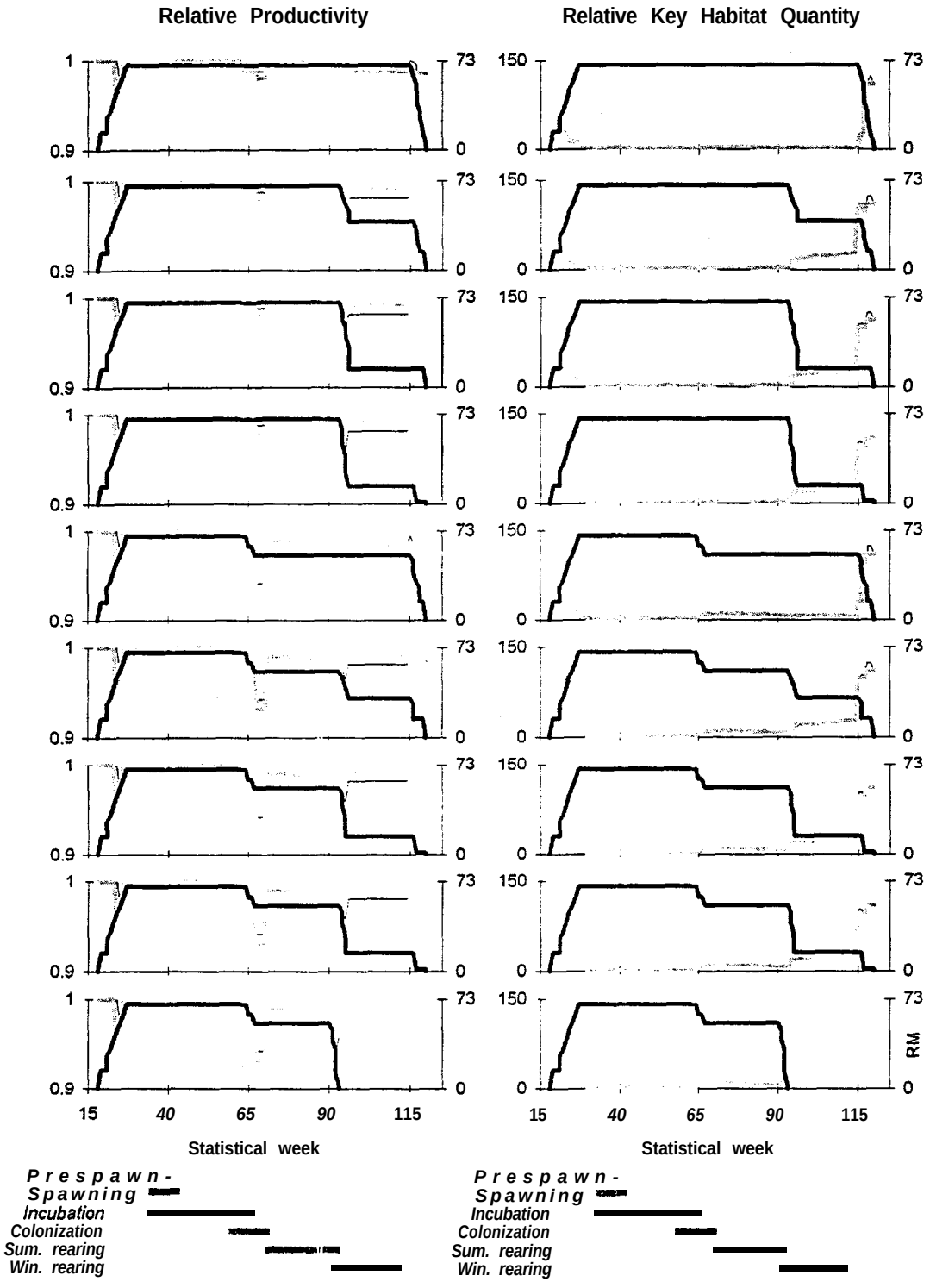


Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
294	0.65
298	0.65
Traj. #2	
306	0.69
251	0.57
Traj. #3	
302	0.69
244	0.56
Traj. #4	
302	0.69
244	0.56
Traj. #5	
121	0.27
124	0.28
Traj. #6	
146	0.36
120	0.29
Traj. #7	
146	0.36
120	0.29
Traj. #8	
146	0.36
120	0.29
Traj. #9	
279	0.74
263	0.69

Trajectory
Template
Patient

Spawning reach: Wenaha R.

South Fork Wenaha R (RM 65.9 - 72.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
435	0.23
486	0.24
Traj. #2	
450	0.29
407	0.25
Traj. #3	
445	0.29
398	0.25
Traj. #4	
443	0.29
393	0.25
Traj. #5	
259	0.23
274	0.24
Traj. #6	
286	0.27
245	0.22
Traj . #7	
286	0.27
241	0.22
Traj. #8	
2 8 6)	
241	0.22
Traj. #9	
518	0.52
509	0.49

APPENDIX B

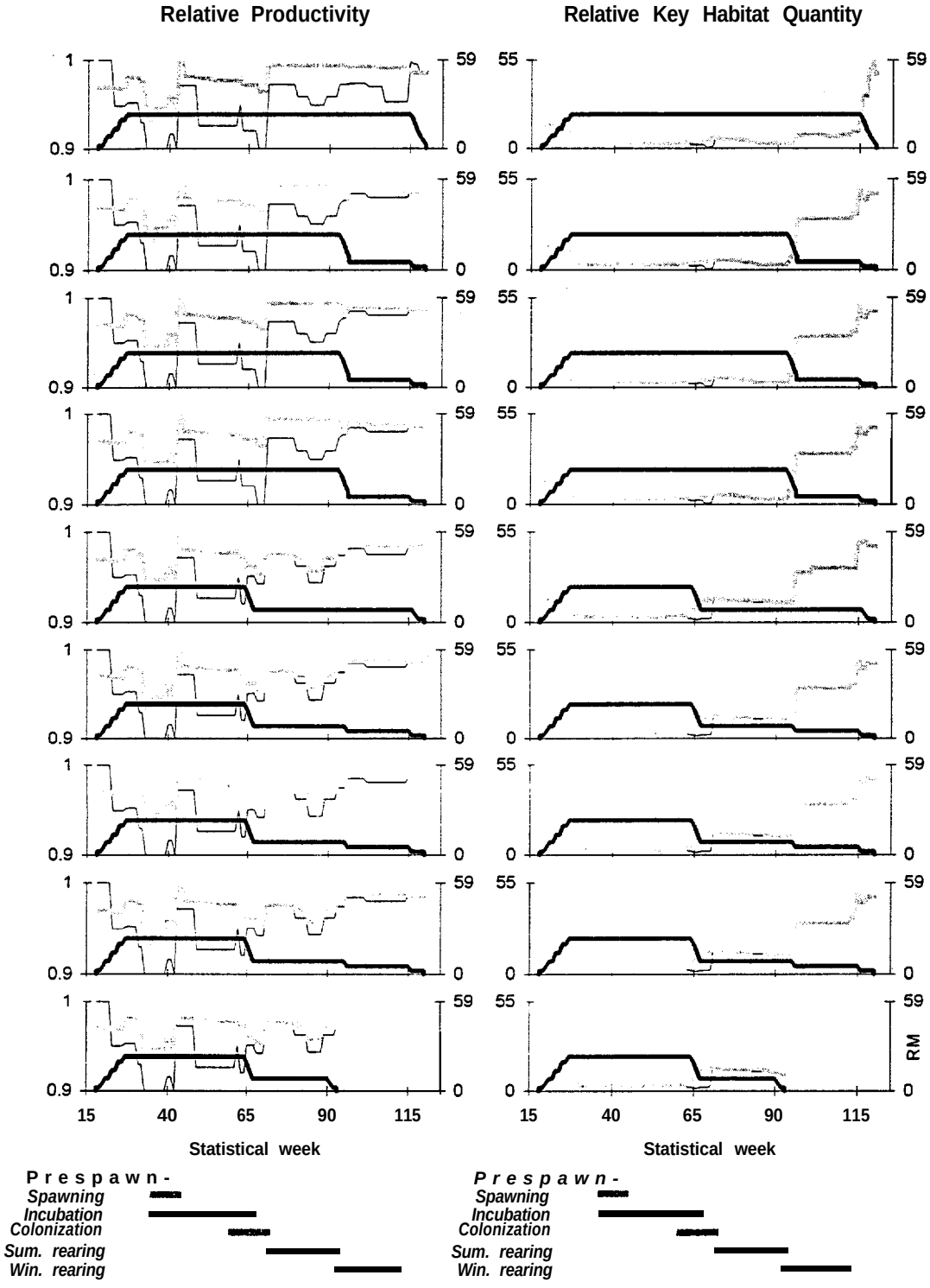
Productivity and Capacity Profiles for **Life History Pathways** in the **Imnaha River** and Tributaries

Spawning reaches analyzed in the Imnaha, listed in the order they appear in Appendix B.

Stream	Reach
Big Sheep Cr.	Mouth - Camp Cr (RM 22.3 - 23.4 from Snake R)
Big Sheep Cr.	Camp Cr -Little Sheep Cr (RM 23.4 - 25.4 from Snake R)
Big Sheep Cr.	Little Sheep Cr - Squaw Cr (RM 25.4 - 37.7 from Snake R)
Big Sheep Cr.	Squaw Cr - Man Cr (RM 37.7 - 39.3 from Snake R)
Big Sheep Cr.	Marr Cr - Griffith Cr (RM 39.3 - 45.3 from Snake R)
Big Sheep Cr.	Griffith Cr - Carrol Cr (RM 45.3 - 47.0 from Snake R)
Big Sheep Cr.	Carrol Cr - Owl Cr (RM 47.0 - 53.5 from Snake R)
Big Sheep Cr.	Owl Cr - Lick Cr (RM 53.5 - 57.4 from Snake R)
Big Sheep Cr.	Lick Cr - South Fork (RM 57.4 - 58.9 from Snake R)
Imnaha R.	Lightning Cr - Horse Cr (RM 5.4 - 10.8 from Snake R)
Imnaha R	Fence Cr -Big Sheep Cr (RM 16.3 - 22.3 from Snake R)
Imnaha R.	Horse Cr - Fence Cr (RM 10.8 - 16.3 from Snake R)
Imnaha R.	Big Sheep Cr - Freezeout Cr (RM 22.3 - 35.2 from Snake R)
Imnaha R.	Freezeout Cr - Grouse Cr (RM 35.2 - 40.6 from Snake R)
Imnaha R.	Grouse Cr - Summit Cr (RM 40.6 - 43.6 from Snake R)
Imnaha R	Summit Cr - Crazyman Cr (RM 43.6 - 49.4 from Snake R)
Imnaha R.	Crazyman Cr - Gumboot Cr (RM 49.4 - 52.7 from Snake R)
Imnaha R.	Gumboot Cr - Dry Cr (RM 52.7 - 55.4 from Snake R)
Imnaha R.	Dry Cr - Skookum Cr (RM 55.4 - 61.9 from Snake R)
Imnaha R.	Blue Hole -forks (RM 66.4 - 71.4 from Snake R)
Imnaha R.	Skookum Cr - Blue Hole (RM 61.9 - 66.4 from Snake R)
Imnaha R.	South Fork Imnaha R (RM 71.4 - 76.1 from Snake R)
Lightning Cr.	Mouth - forks (RM 5.4 - 13.9 from Snake R)
Little Sheep Cr.	Mouth - Bear Gulch (RM 25.4 - 28.5 from Snake R)
Little Sheep Cr.	Bear Gulch - Devil's Gulch (RM 28.5 - 30.9 from Snake R)
Little Sheep Cr.	Devil's Gulch - Lightning Cr (RM 30.9 - 33.1 from Snake R)
Little Sheep Cr.	Lightning Cr -Hayden Cr (RM 33.1 - 38.8 from Snake R)
Little Sheep Cr.	Hayden Cr - McCully Cr (RM 38.8 - 48.8 from Snake R)

Spawning reach: Big Sheep Cr.

Mouth - Camp Cr (RM 22.3 - 23.4 from Snake R)

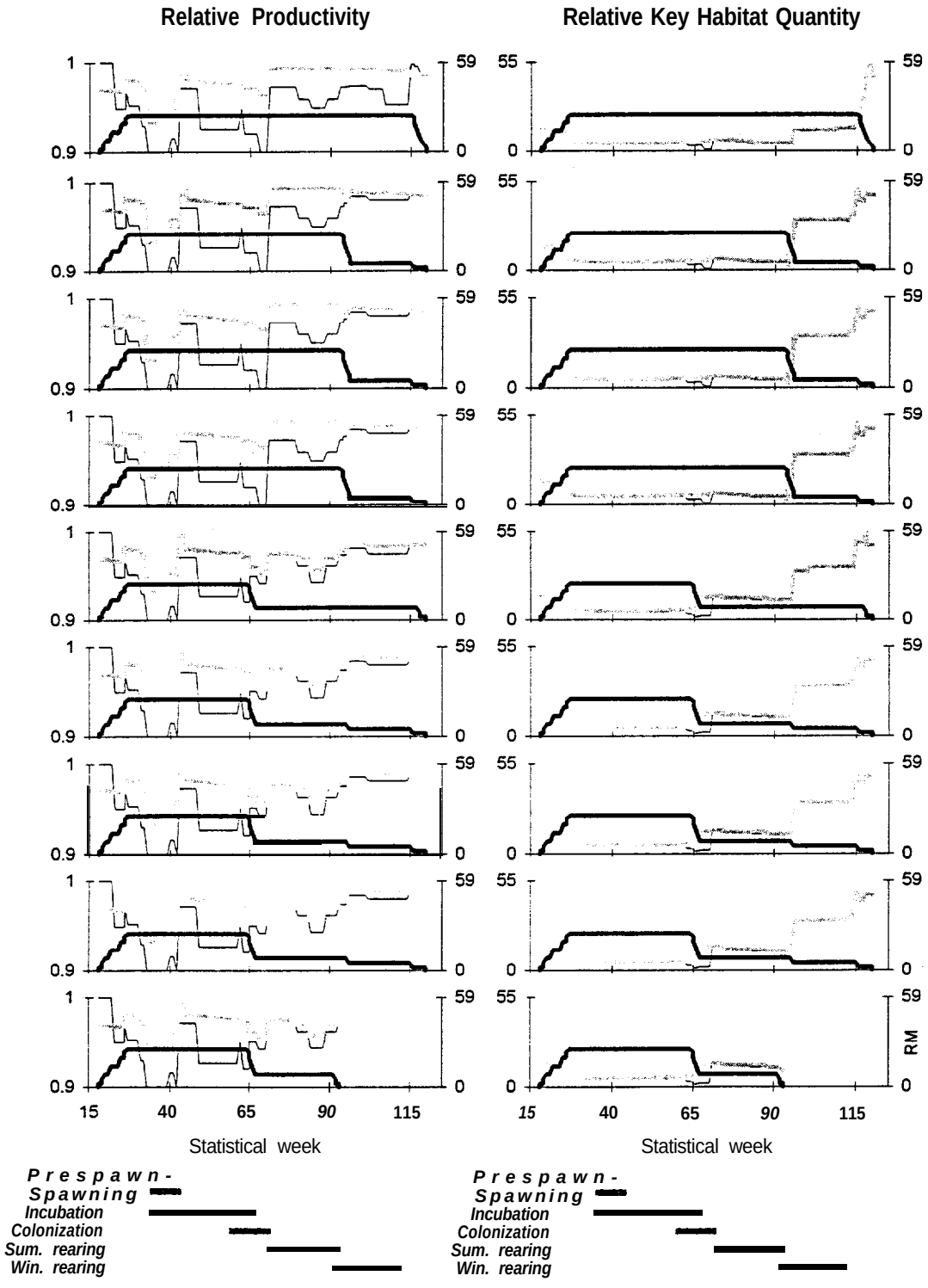


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
106	0.13
2	0.00
Traj. #2	
96	0.13
3	0.01
Traj. #3	
96	0.13
3	0.01
Traj. #4	
96	0.13
3	0.01
Traj. #5	
48	0.07
4	0.01
Traj. #6	
52	0.08
4	0.01
Traj. #7	
52	0.08
4	0.01
Traj . #8	
52	0.08
4	0.01
Traj. #9	
104	0.16
10	0.02

Trajectory
Template
Patient

Spawning reach: Big Sheep Cr.

Camp Cr - Little Sheep Cr (RM 23.4 - 25.4 from Snake R)

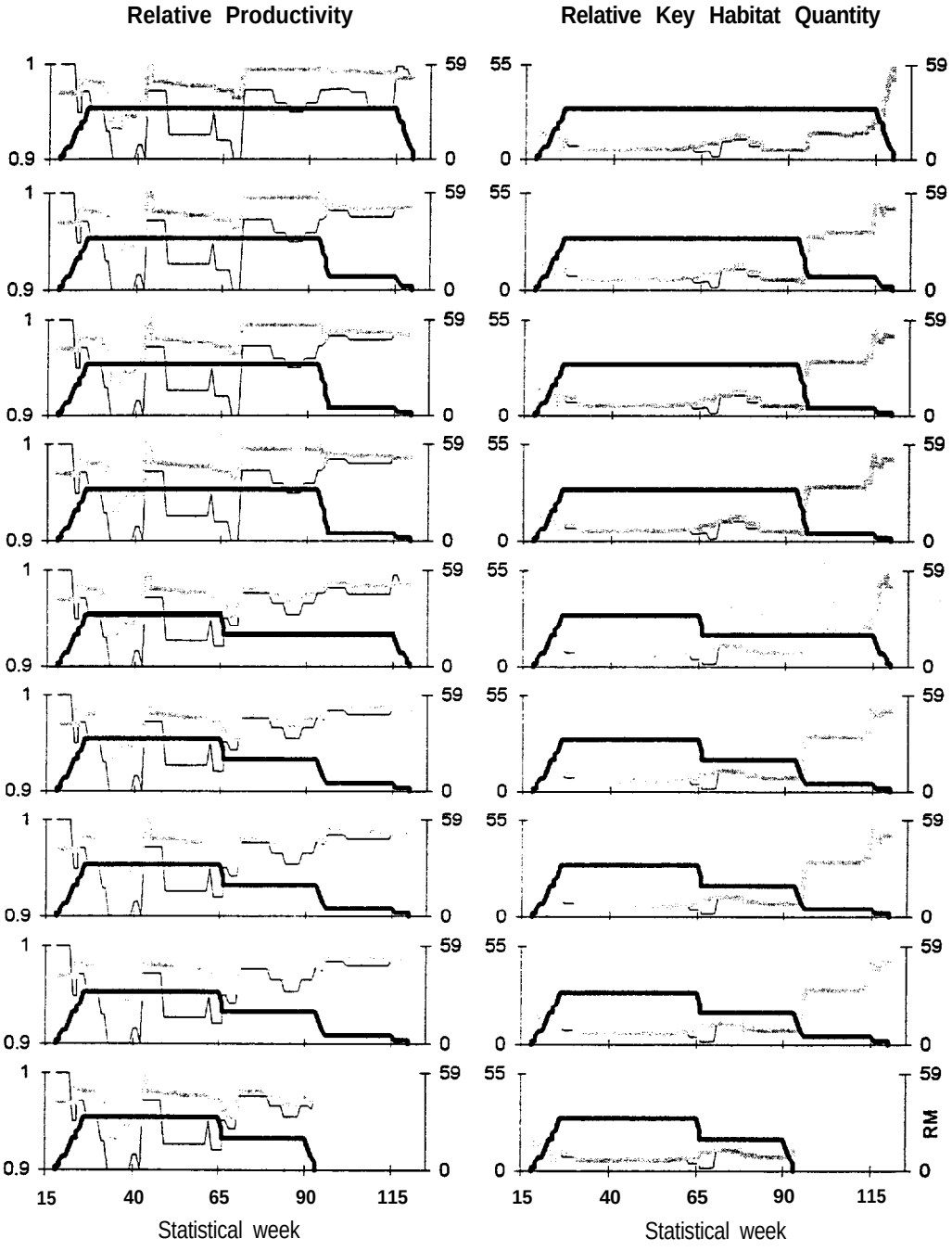


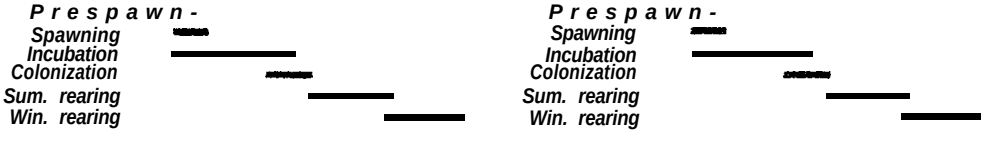
Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
‘ “ : I	
Traj. #2	
‘ : I	
Traj. #3	
97	0.16
3	0.01
Traj. #4	
97	0.16
3	0.01
Traj . #5	
49	0.09
4	0.01
Traj. #6	
52	0.10
4	0.01
Traj. #7	
52	0.10
4	0.01
Traj. #8	
“ : I	
Traj. #9	
104	0.20
10	0.02

Trajectory
Template
Patient

Spawning reach: Big Sheep Cr.

Little Sheep Cr - Squaw Cr (RM 25.4 - 37.7 from Snake R)



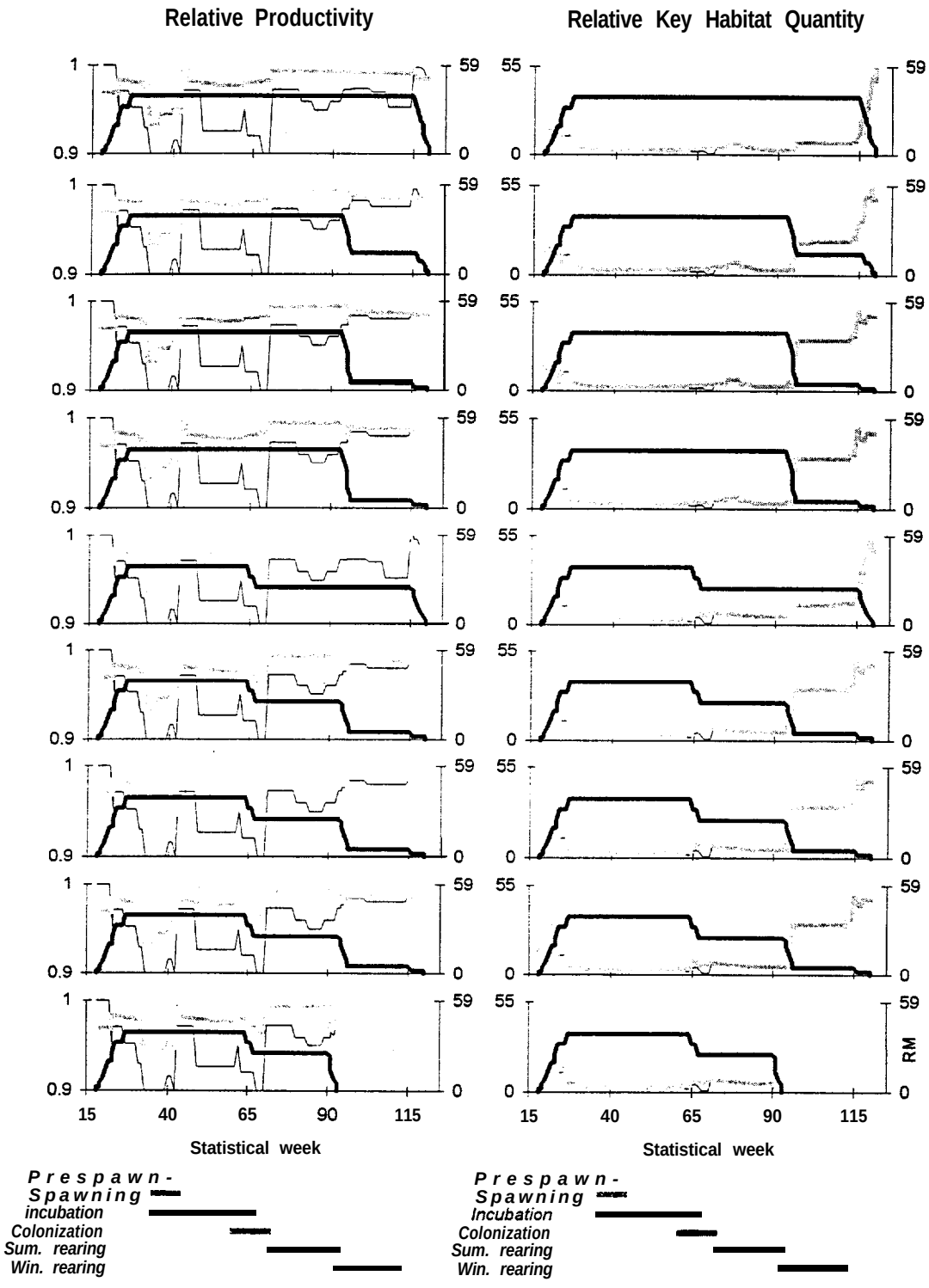


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
116	0.22
3	0.01
Traj. #2	
99	0.19
3	0.01
Traj. #3	
105	0.20
4	0.01
Traj. #4	
105	0.20
4	0.01
Traj. #5	
59	0.12
5	0.01
Traj. #6	
62	0.13
5	0.01
Traj. #7	
62	0.13
5	0.01
Traj. #8	
62	0.13
5	0.01
Traj. #9	
124	0.26
11	0.02

Trajectory
Template
Patient

Spawning reach: Big Sheep Cr.

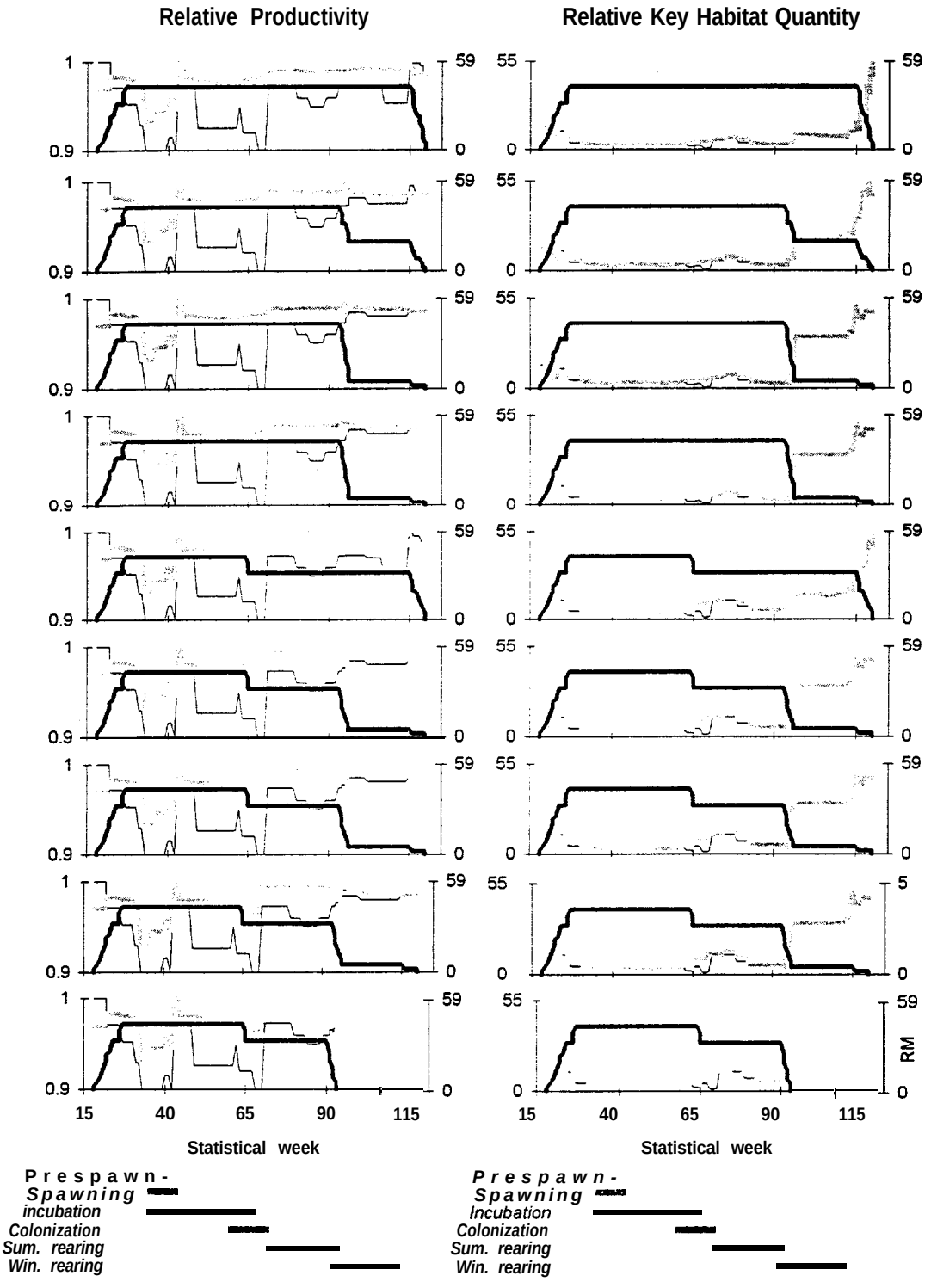
Squaw Cr - Man Cr (RM 37.7 - 39.3 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
125	0.16
3	0.00
Traj. #2	
108	0.14
3	0.00
Traj. #3	
115	0.15
4	0.01
Traj. #4	
115	0.15
4	0.01
Traj. #5	
114	0.16
3	0.00
Traj. #6	
104	0.15
4	0.01
Traj. #7	
104	0.15
4	0.01
Traj. #8	
104	0.15
4	0.01
Traj. #9	
196	0.29
9	0.01

Spawning reach: Big Sheep Cr.

Marr Cr - Griffith Cr (RM 39.3 - 45.3 from Snake R)

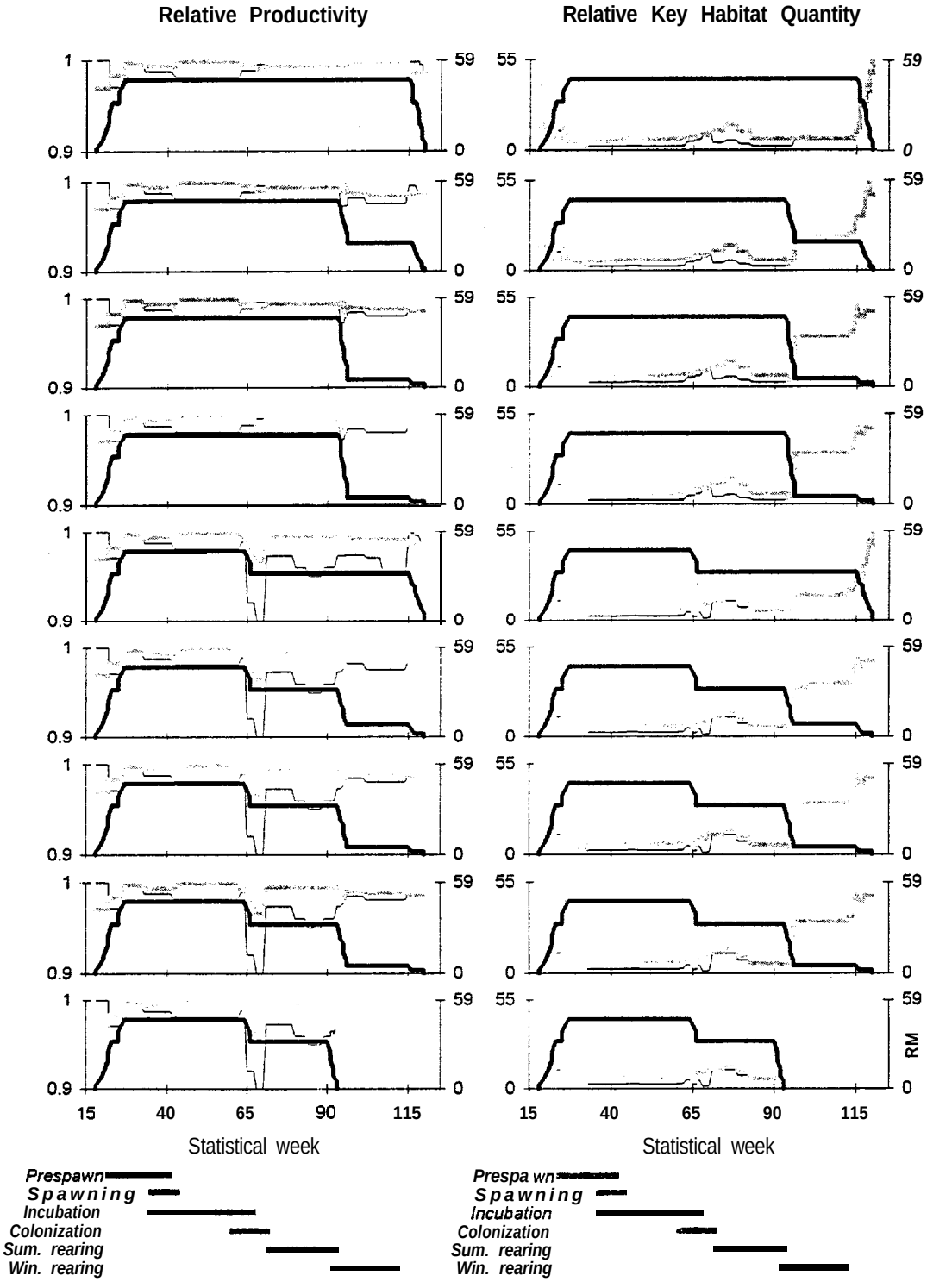


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
114	0.16
3	0.00
Traj. #2	
101	0.15
3	0.01
Traj. #3	
105	0.16
4	0.01
Traj. #4	
105	0.16
4	0.01
Traj. #5	
122	0.19
3	0.00
Traj. #6	
110	0.18
4	0.01
Traj. #7	
110	0.18
4	0.01
Traj. #8	
110	0.18
4	0.01
Traj. #9	
206	0.34
9	0.01

Trajectory
Template
Patient

Spawning reach: Big Sheep Cr.

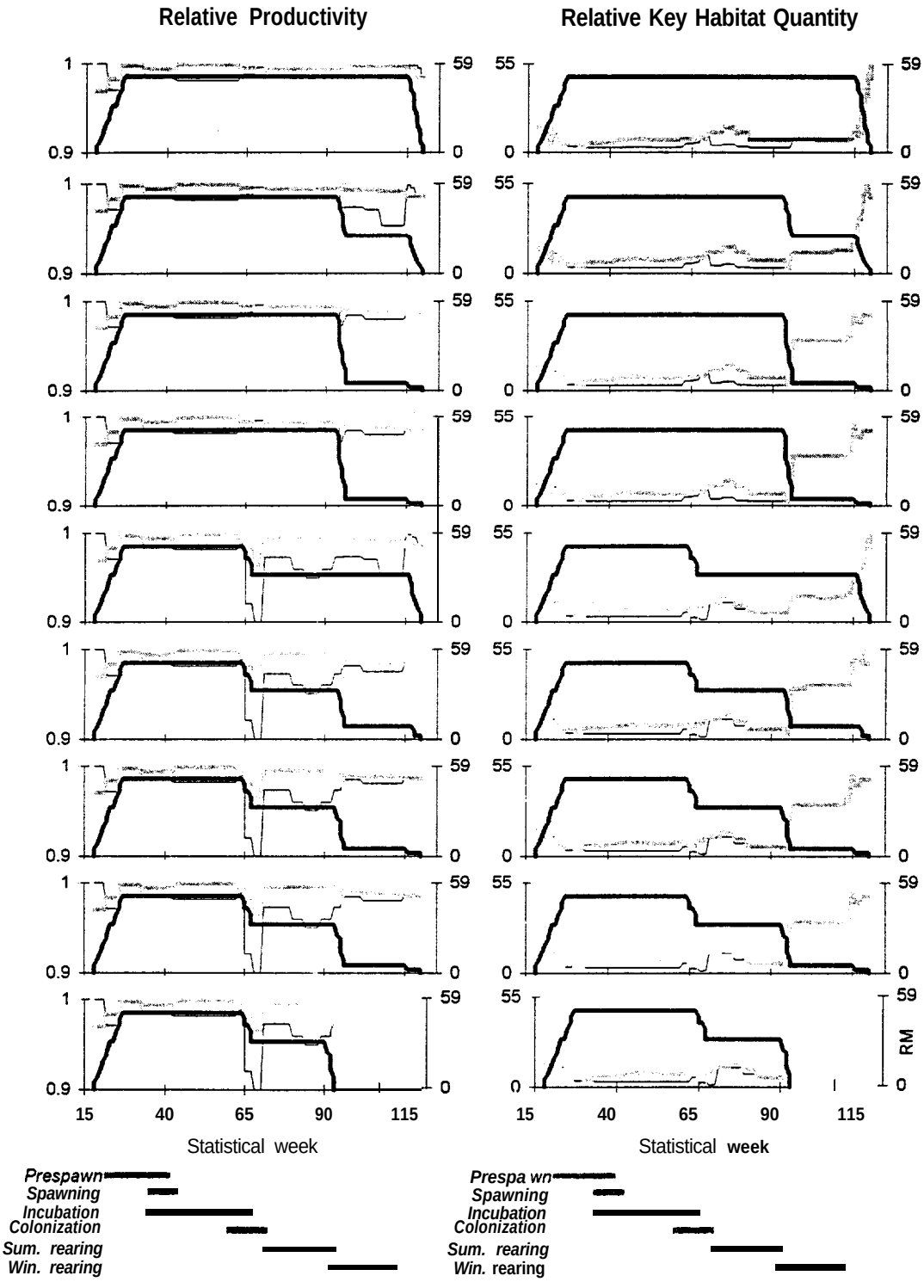
Griffith Cr - Carrol Cr (RM 45.3 - 47.0 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
408	0.39
325	0.25
Traj. #2	
323	0.33
207	0.17
Traj. #3	
340	0.36
217	0.18
Traj. #4	
340	0.36
217	0.18
Traj. #5	
342	0.35
44	0.04
Traj. #6	
292	0.31
55	0.05
Traj. #7	
311	0.33
59	0.06
Traj. #8	
311	0.33
59	0.06
Traj. #9	
579	0.66
137	0.14

Spawning reach: Big Sheep Cr.

Carrol Cr - Owl Cr (RM 47.0 - 53.5 from Snake R)

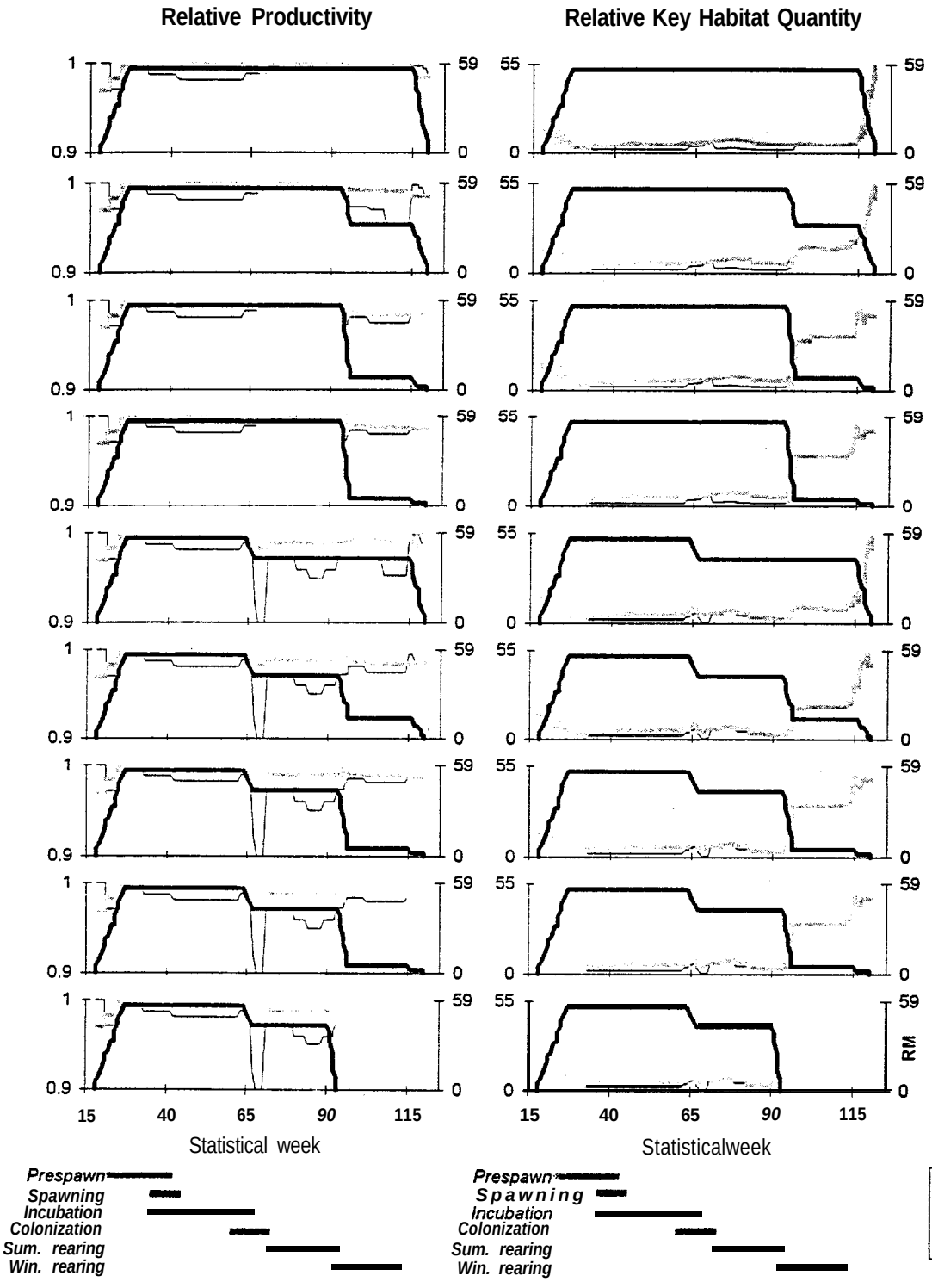


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
416	0.41
321	0.25
Traj. #2	
372	0.38
159	0.13
Traj. #3	
344	0.37
215	0.18
Traj. #4	
344	0.37
215	0.18
Traj. #5	
350	0.36
44	0.04
Traj. #6	
303	0.32
55	0.05
Traj. #7	
319	0.34
59	0.06
Traj. #8	
319	0.34
59	0.06
Traj. #9	
603	0.68
137	0.13

Trajectory
--- Template Patient

Spawning reach: Big Sheep Cr.

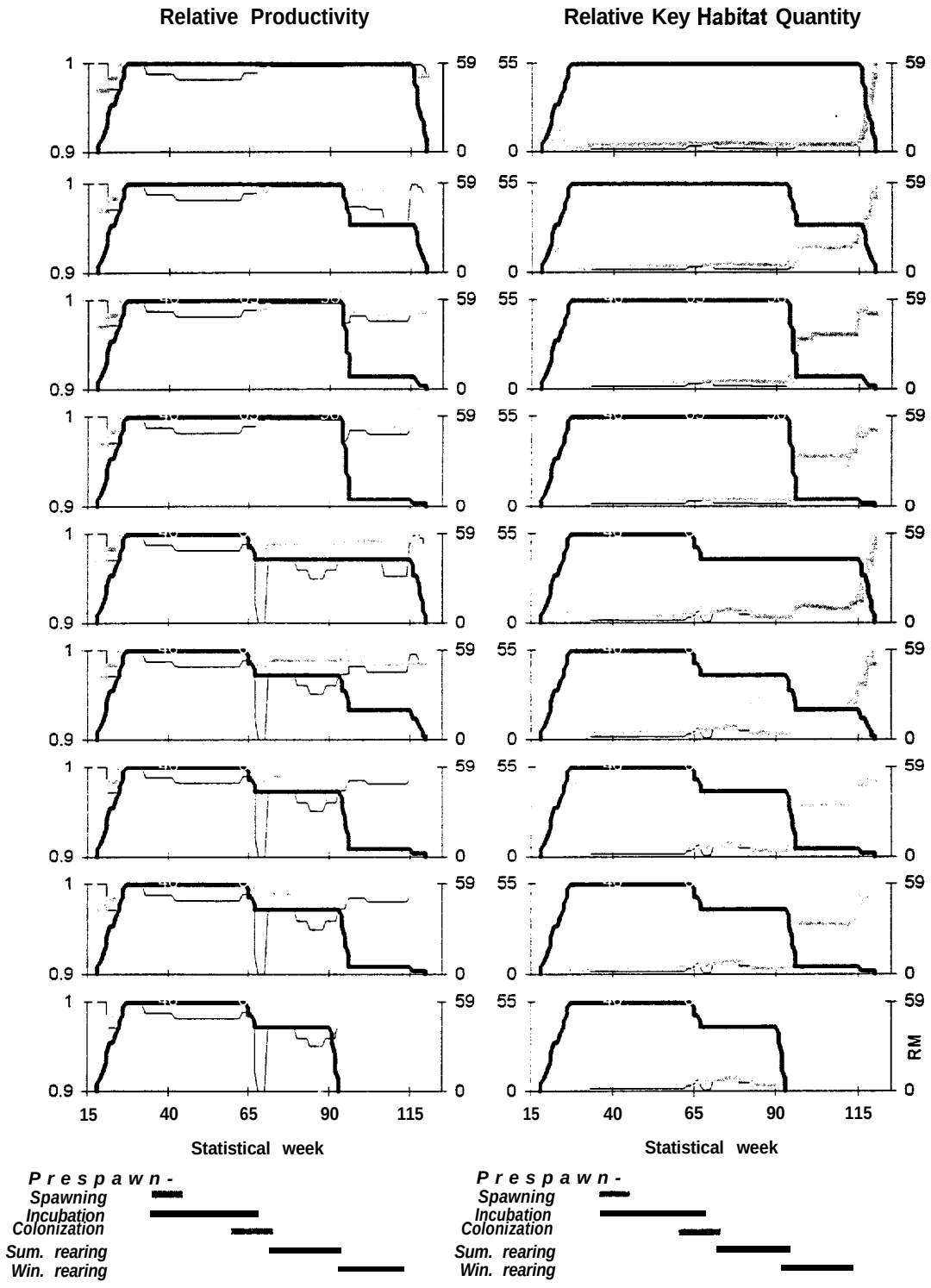
Owl Cr - Lick Cr (RM 53.5 - 57.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
477	**0.35**
330	**0.19**
Traj. #2	
420	0.33
168	0.11
Traj. #3	
369	0.30
206	0.13
Traj. #4	
393	0.32
221	0.14
Traj. #5	
334	0.25
51	0.04
Traj. #6	
294	**0.23**
64	**0.04**
Traj. #7	
310	0.25
68	0.05
Traj. #8	
310	0.25
68	0.05
Traj. #9	
596	0.51
159	0.11

Spawning reach: Big Sheep Cr.

Lick Cr - South Fork (RM 57.4 - 58.9 from Snake R)

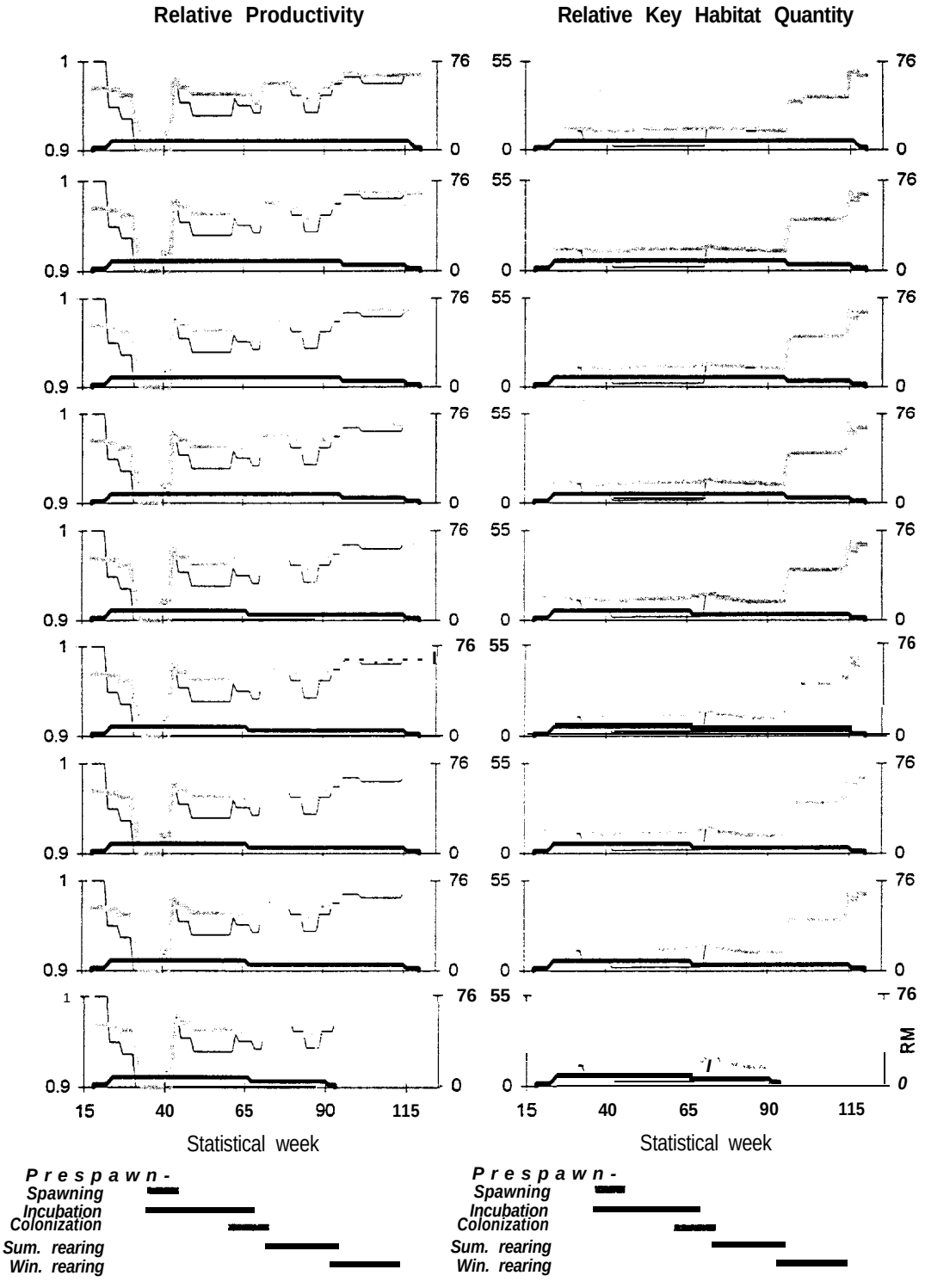


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
509	0.26
329	0.15
Traj. #2	
448	0.25
168	0.08
Traj. #3	
395	0.23
205	0.10
Traj. #4	
421	0.24
221	0.11
Traj . #5	
357	0.21
52	0.03
Traj. #6	
316	0.19
66	0.04
Traj. #7	
331	0.20
69	0.04
Traj. #8	
331	0.20
69	0.04
Traj. #9	
637	0.41
161	0.10

Trajectory
Template
Patient

Spawning reach: Imnaha R.

Lightning Cr - Horse Cr (RM 5.4 - 10.8 from Snake R)

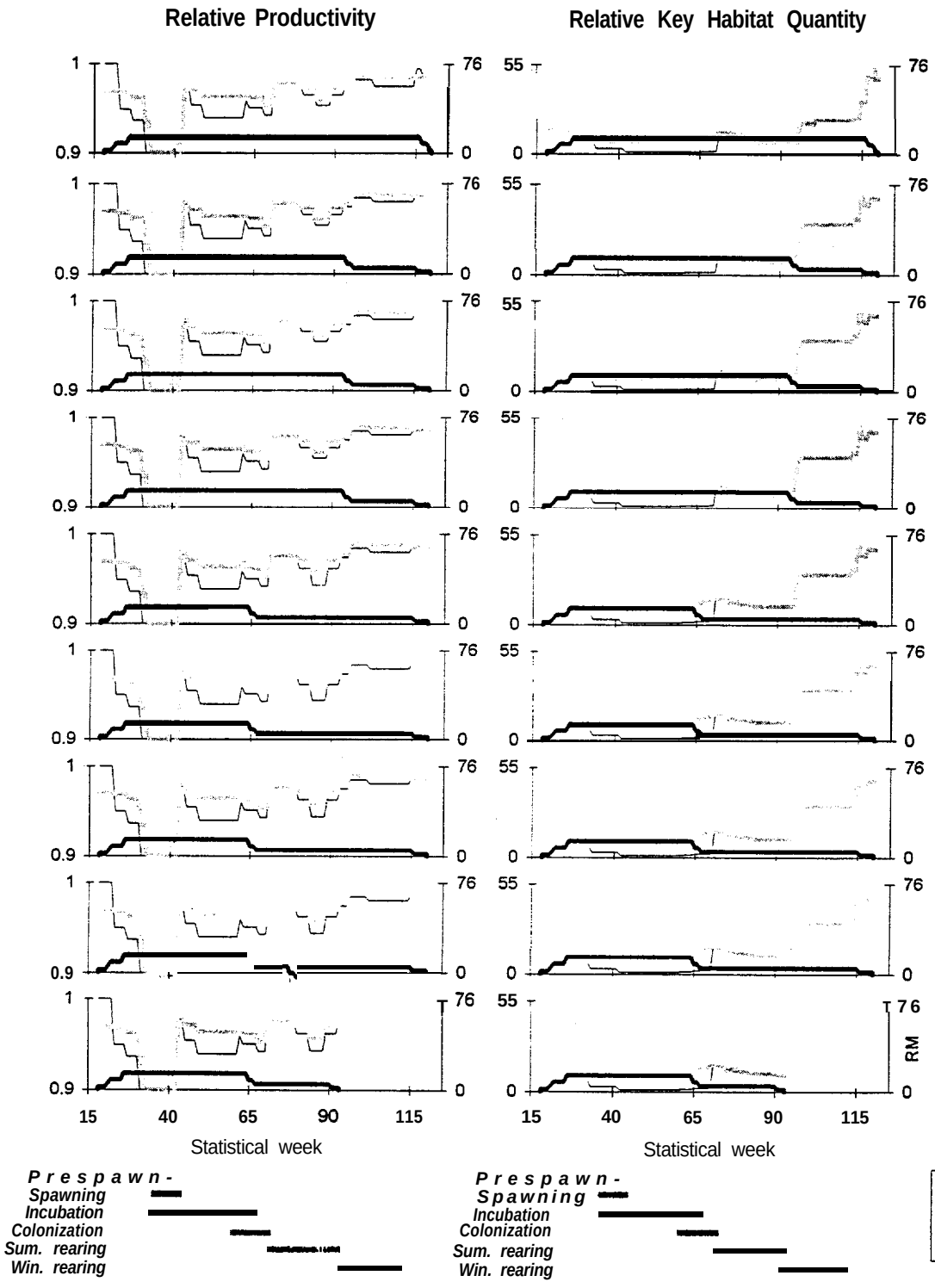


Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	1	0.00
	0	0.00
Traj. #2	1	0.00
	0	0.00
Traj. #3	1	0.00
	0	0.00
Traj. #4	1	0.00
	0	0.00
Traj. #5	1	0.00
	0	0.00
Traj. #6	1	0.00
	0	0.00
Traj. #7	1	0.00
	0	0.00
Traj. #8	1	0.00
	0	0.00
Traj. #9	2	0.01
	0	0.00

Trajectory
Template
Patient

Spawning reach: Imnaha R.

Horse Cr - Fence Cr (RM **10.8** - 16.3 from Snake R)

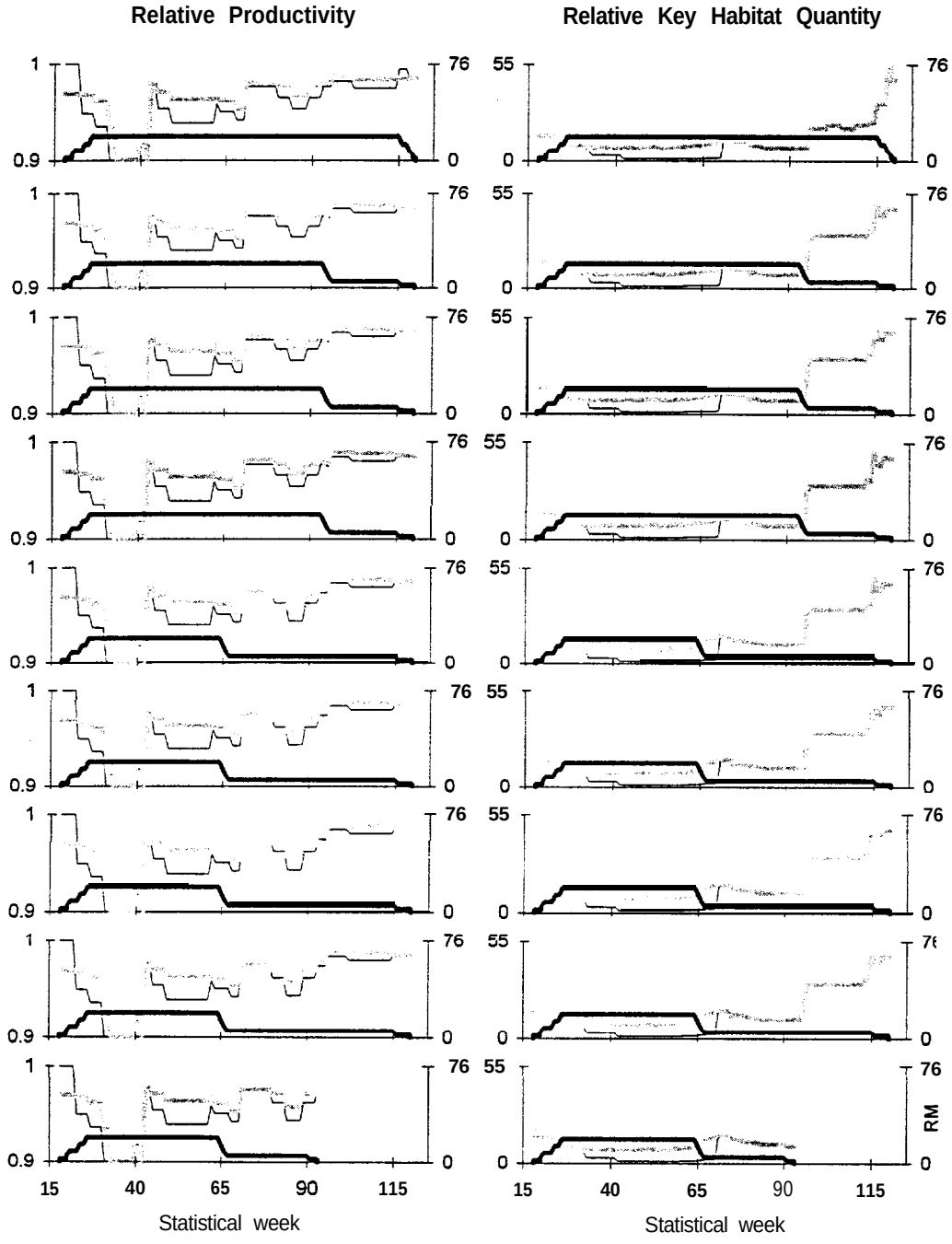


Template Patient	Cum. Prod.	Cum. Cap.
Traj. #1	1	0.00
	0	0.00
Traj. #2	1	0.00
	0	0.00
Traj. #3	1	0.00
	0	0.00
Traj. #4	1	0.00
	0	0.00
Traj. #5	1	0.00
	0	0.00
Traj. #6	1	0.00
	0	0.00
Traj. #7	1	0.00
	0	0.00
Traj. #8	1	0.00
	0	0.00
Traj. #9	1	0.00
	0	0.00

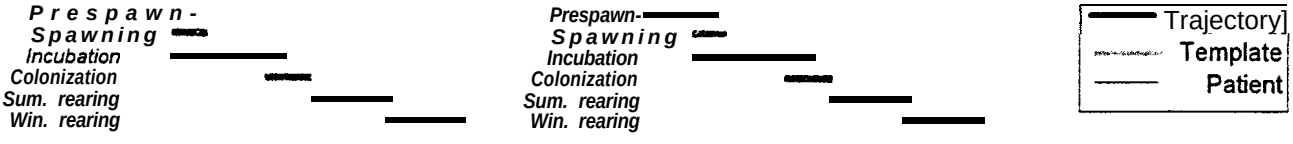
Trajectory
Template
Patient

Spawning reach: Imnaha R.

Fence Cr - Big Sheep Cr (RM 16.3 - 22.3 from Snake R)

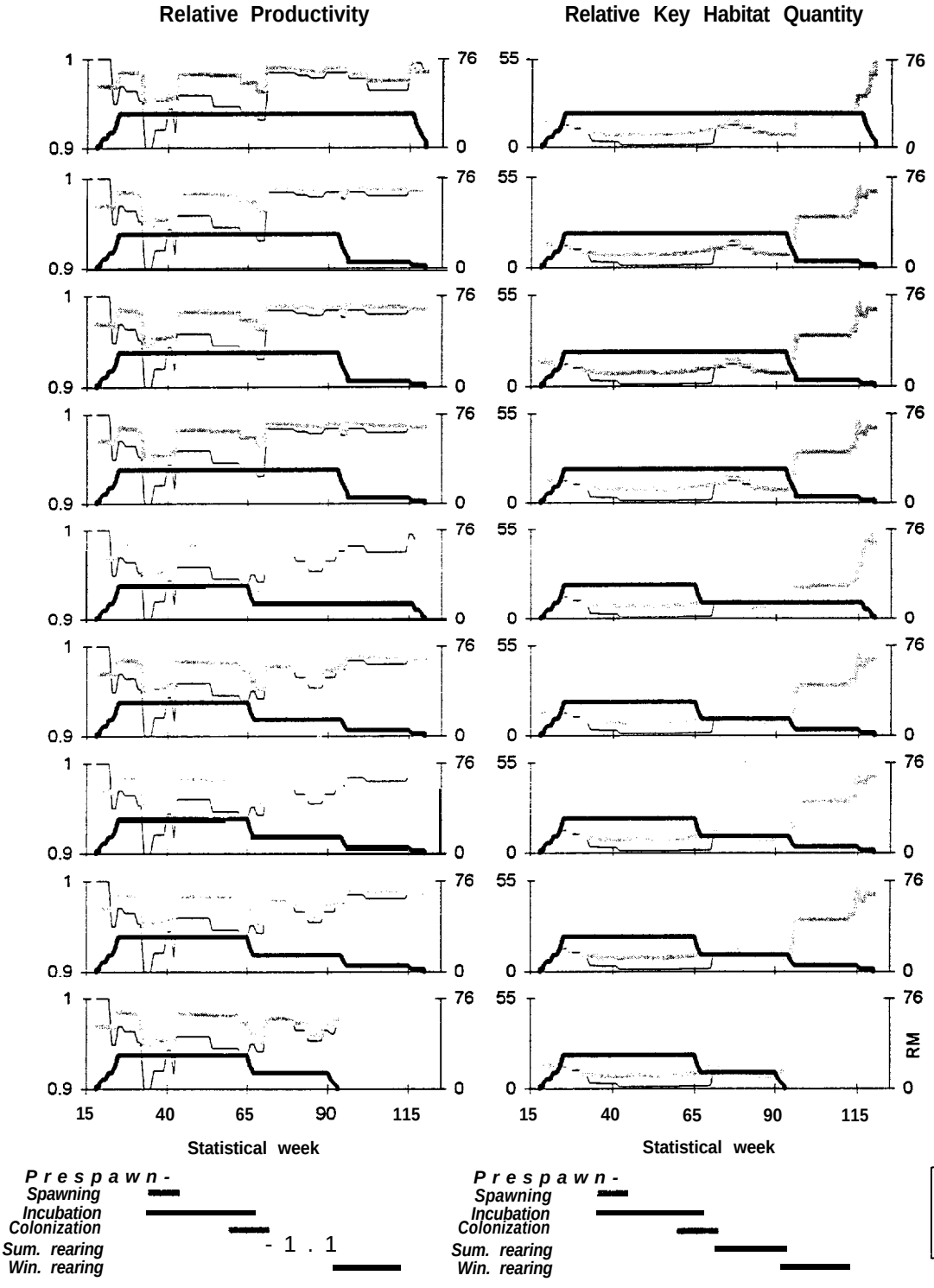


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
1	0.00
0	0.00
Traj. #2	
1	0.00
0	0.00
Traj. #3	
1	0.00
0	0.00
Traj. #4	
1	0.00
0	0.00
Traj. #5	
1	0.00
0	0.00
Traj. #6	
1	0.00
0	0.00
Traj. #7	
1	0.00
0	0.00
Traj. #8	
1	0.00
0	0.00
Traj. #9	
2	0.01
0	0.00



Spawning reach: Imnaha R.

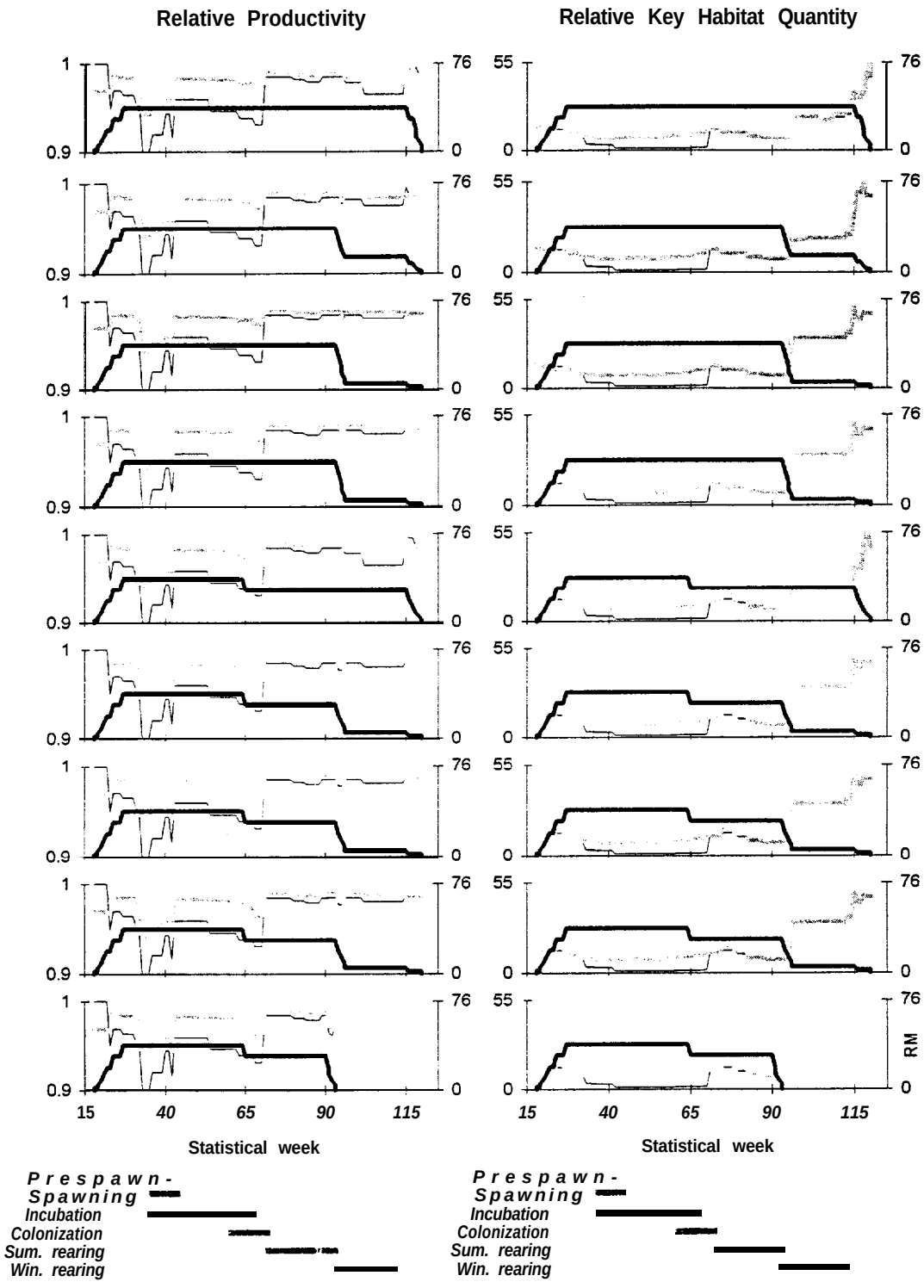
Big Sheep Cr - Freezeout Cr (RM 22.3 - 35.2 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
85	0.20
16	0.04
Traj. #2	
100	0.24
19	0.04
Traj. #3	
100	0.24
19	0.04
Traj. #4	
100	0.24
19	0.04
Traj. #5	
61	0.15
14	0.03
Traj. #6	
65	0.16
14	0.03
Traj. #7	
65	0.16
14	0.03
Traj. #8	
65	0.16
14	0.03
Traj. #9	
129	0.32
33	0.07

Spawning reach: Imnaha R.

Freezeout Cr - Grouse Cr (RM 35.2 - 40.6 from Snake R)

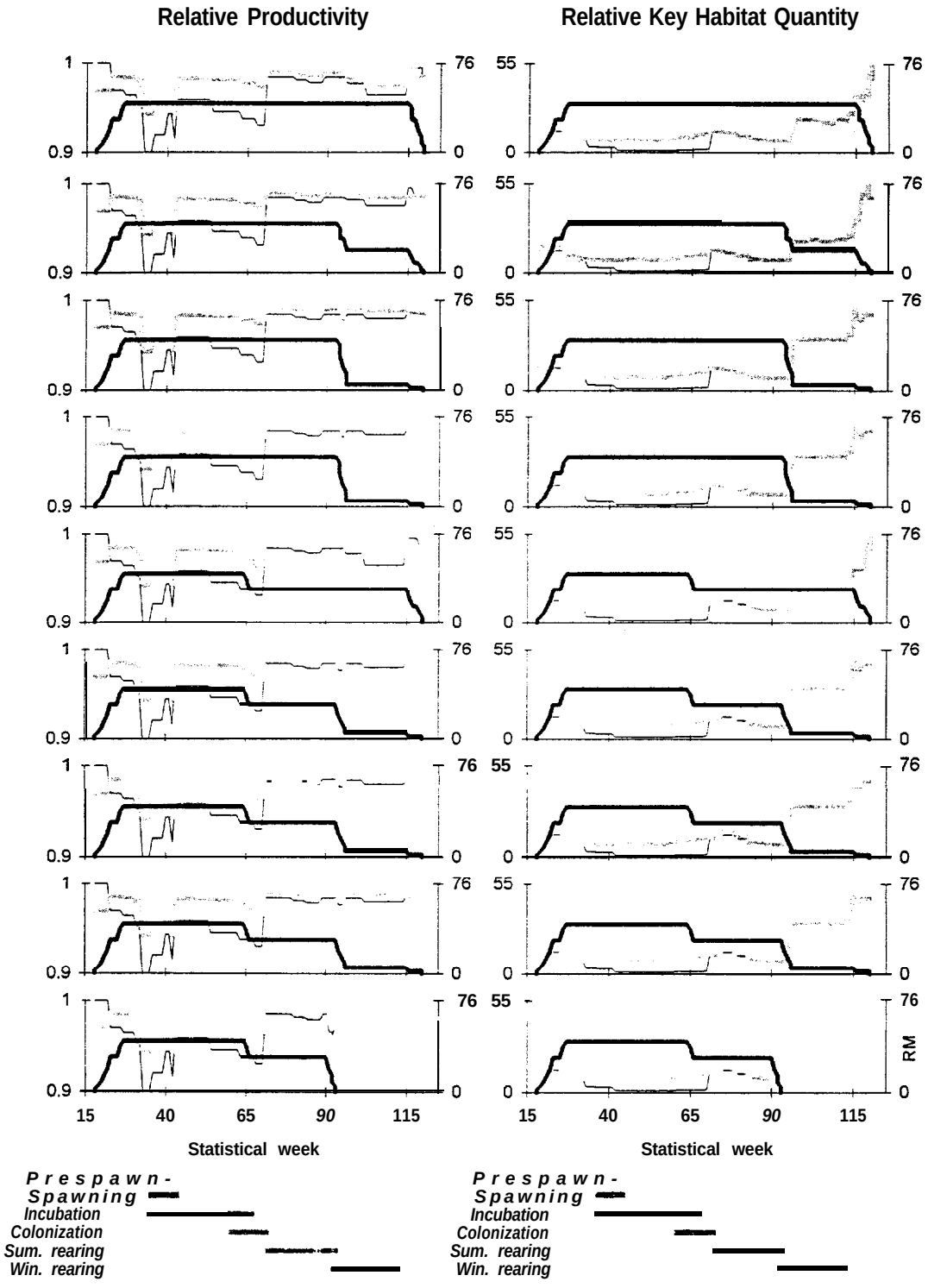


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
92	0.21
16	0.04
Traj. #2	
103	0.23
18	0.04
Traj. #3	
109	0.24
20	0.04
Traj. #4	
109	0.24
20	0.04
Traj. #5	
87	0.19
16	0.04
Traj. #6	
103	0.23
19	0.04
Traj. #7	
103	0.23
19	0.04
Traj. #8	
103	0.23
19	0.04
Traj. #9	
198	0.47
43	0.09

Trajectory
Template
Patient

Spawning reach: Imnaha R.

Grouse Cr - Summit Cr (RM 40.6 - 43.6 from Snake R)

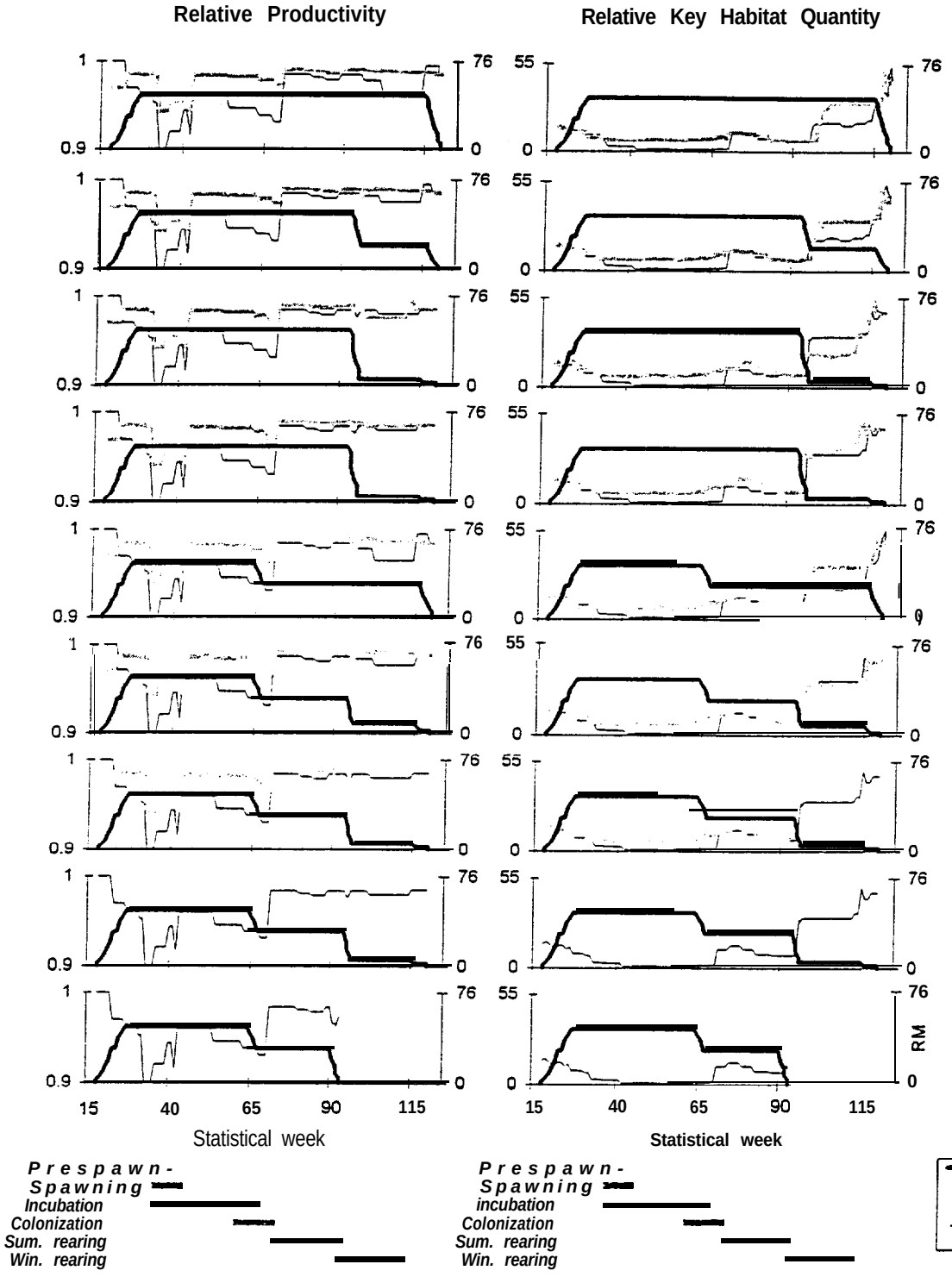


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
94	0.20
17	0.04
Traj. #2	
105	0.23
19	0.04
Traj. #3	
111	0.24
20	0.04
Traj. #4	
111	0.24
20	0.04
Traj. #5	
89	0.19
17	0.04
Traj. #6	
106	0.23
20	0.04
Traj. #7	
106	0.23
20	0.04
Traj. #8	
106	0.23
20	0.04
Traj. #9	
203	0.46
44	0.10

Trajectory
Template
Patient

Spawning reach: Imnaha R.

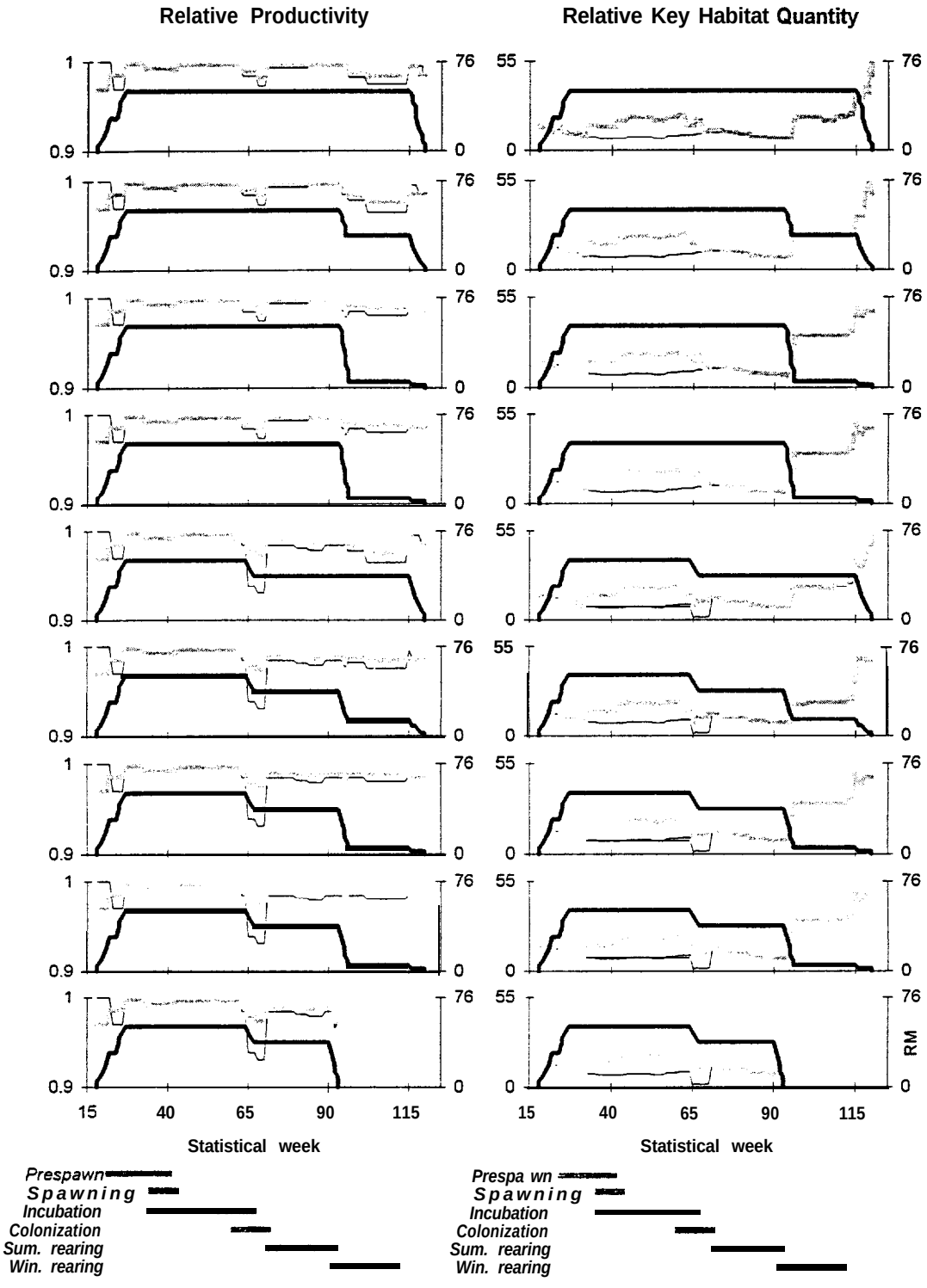
Summit Cr - Crazyman Cr (RM 43.6 - 49.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
94	0.19
17	0.03
Traj. #2	
105	0.21
19	0.04
Traj. #3	
111	0.23
20	0.04
Traj. #4	
111	0.23
20	0.04
Traj. #5	
90	0.19
17	0.03
Traj. #6	
101	0.21
19	0.04
Traj. #7	
107	0.23
20	0.04
Traj. #8	
107	0.23
20	0.04
Traj. #9	
204	0.45
44	0.09

Spawning reach: Imnaha R.

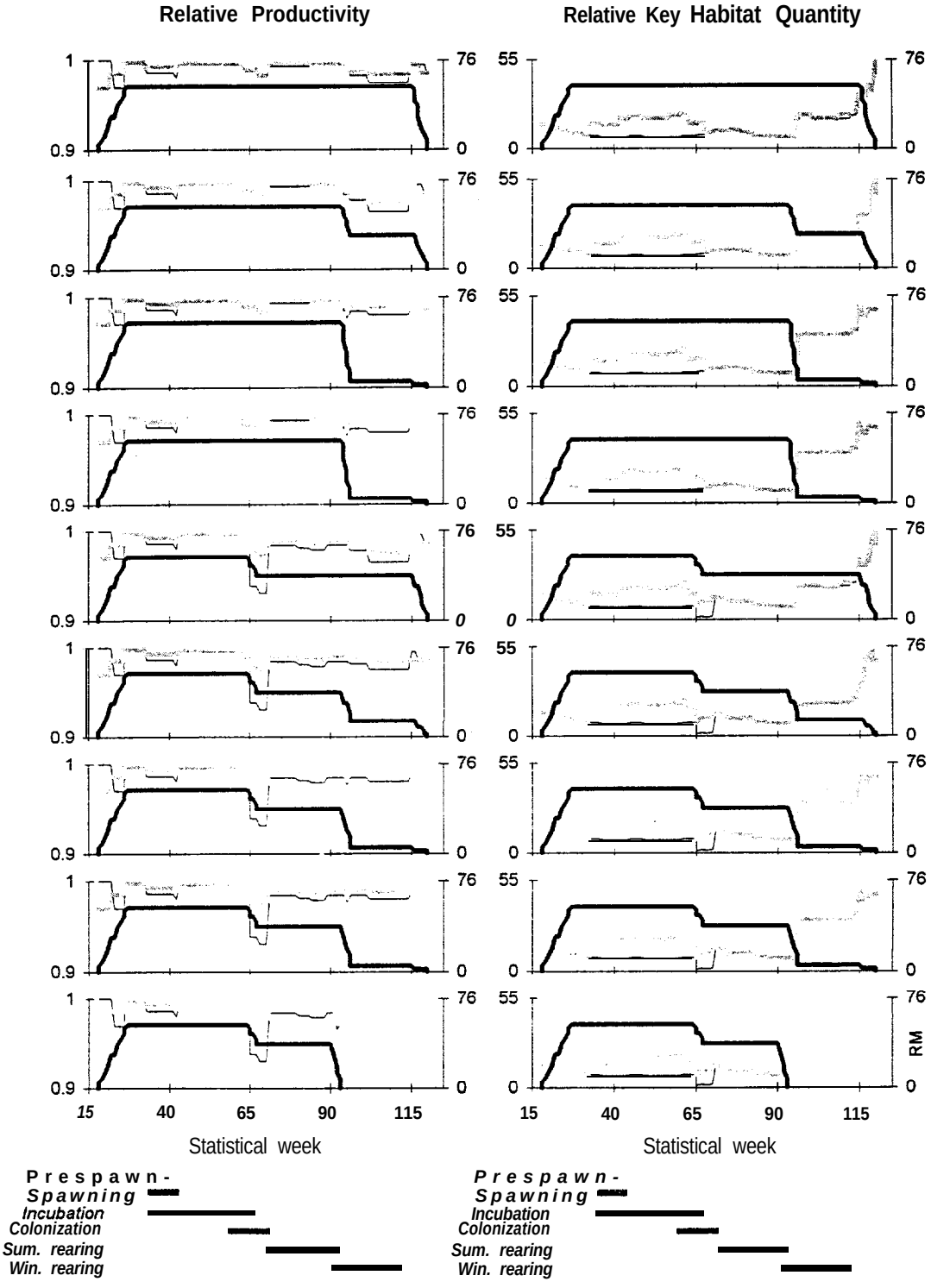
Crazyman Cr - Gumboot Cr (RM 49.4 - 52.7 from Snake R)



Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
323	0.51
268	0.39
Traj. #2	
271	0.43
219	0.32
Traj. #3	
329	0.53
270	0.40
Traj. #4	
329	0.53
270	0.40
Traj. #5	
216	0.36
130	0.18
Traj. #6	
242	0.41
148	0.20
Traj. #7	
258	0.44
158	0.22
Traj. #8	
258	0.44
158	0.22
Traj. #9	
498	0.92
350	0.50

Spawning reach: Imnaha R.

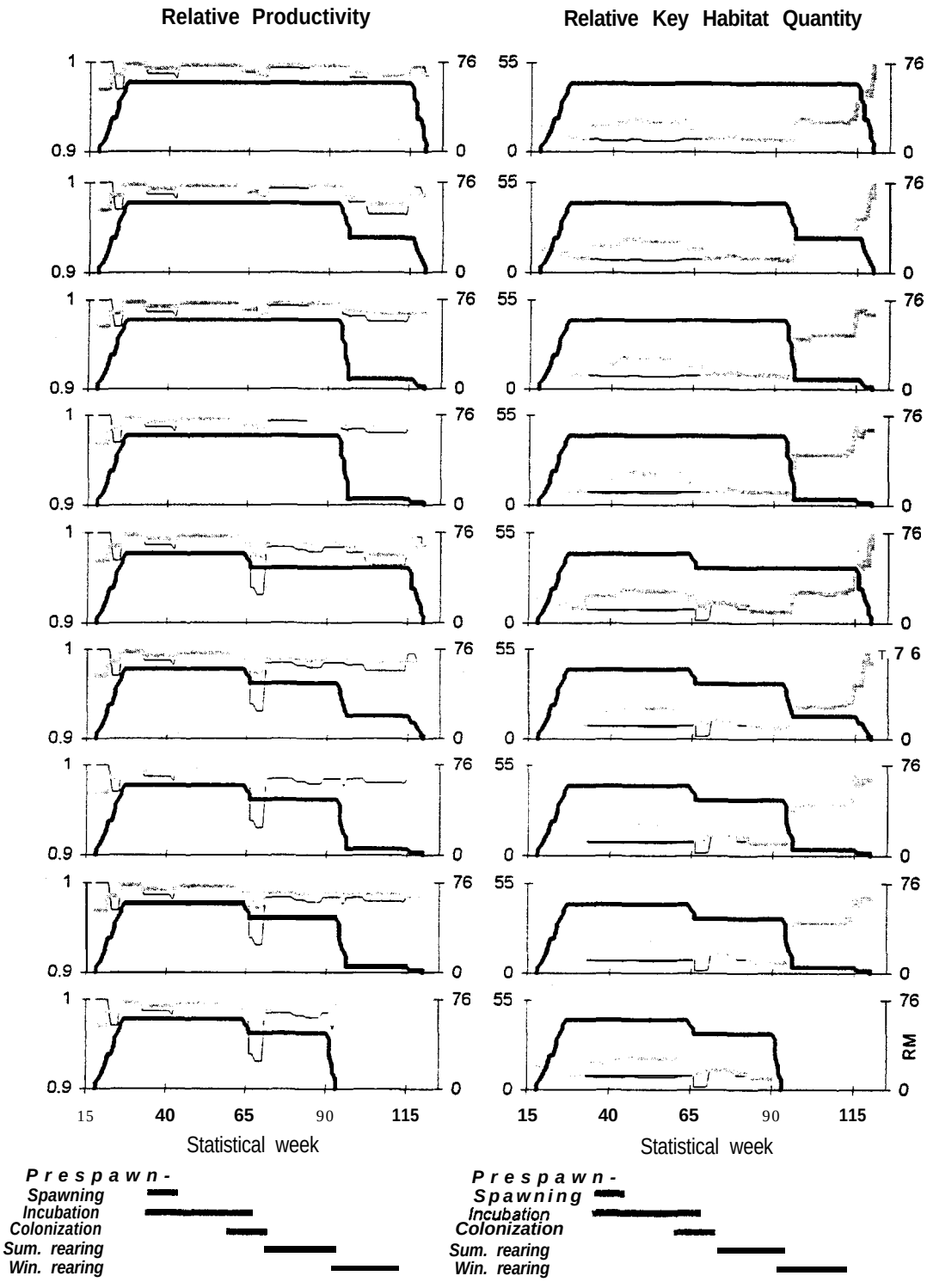
Gumboot Cr - Dry Cr (RM 52.7 - 55.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
324	0.50
269	0.39
Traj. #2	
275	0.43
222	0.32
Traj. #3	
330	0.52
270	0.40
Traj. #4	
330	0.52
270	0.40
Traj. #5	
220	0.37
127	0.18
Traj. #6	
247	0.41
147	0.20
Traj. #7	
260	0.44
154	0.21
Traj. #8	
260	0.44
154	0.21
Traj. #9	
503	0.91
342	0.50

Spawning reach: Imnaha R.

Dry Cr - Skookum Cr (RM 55.4 - 61.9 from Snake R)

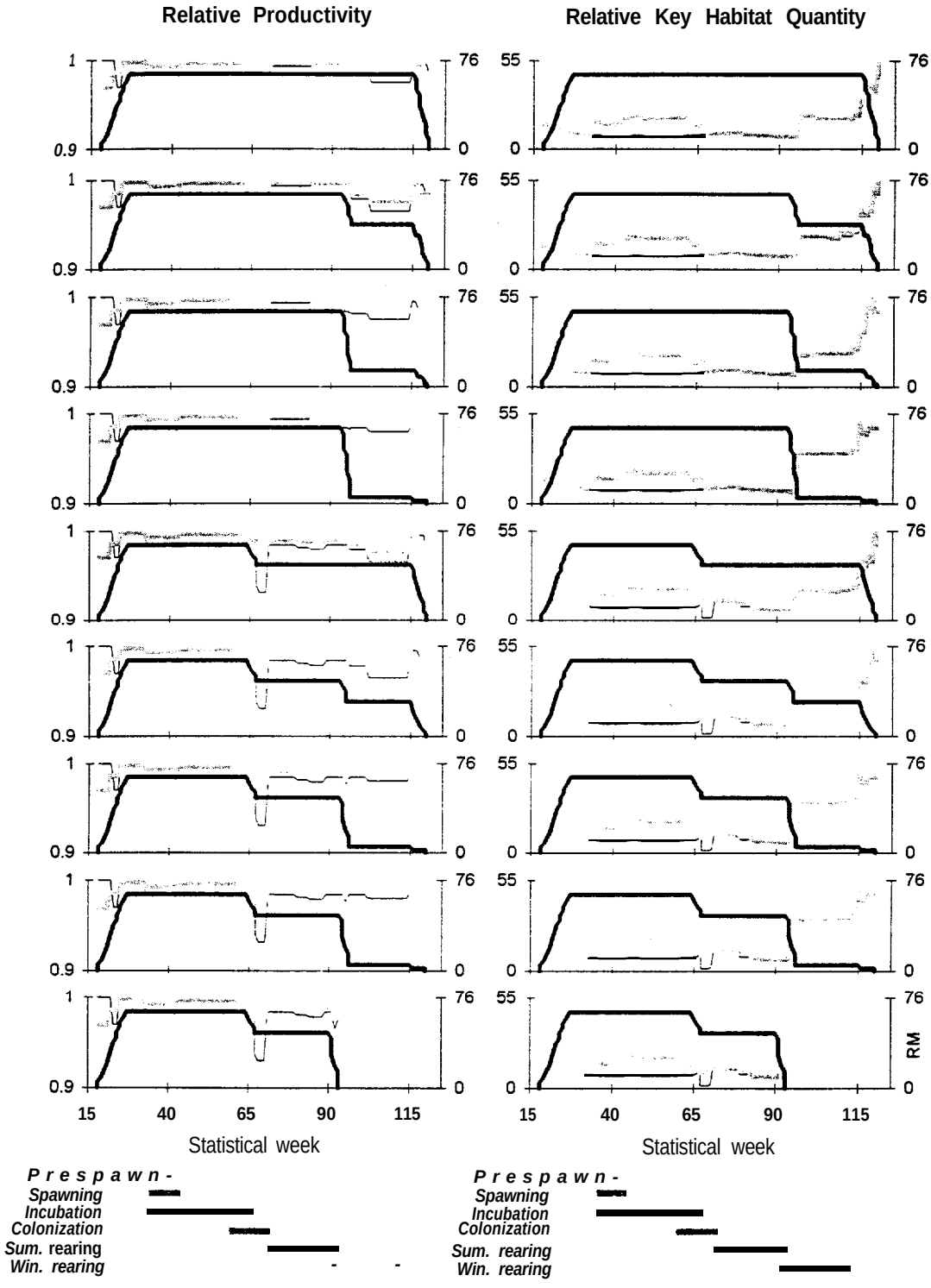


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
330	0.48
288	0.38
Traj. #2	
279	0.41
239	0.32
Traj. #3	
314	0.47
270	0.37
Traj. #4	
334	0.50
291	0.40
Traj. #5	
224	0.35
143	0.18
Traj. #6	
251	0.39
167	0.21
Traj. #7	
265	0.42
173	0.22
Traj. #8	
265	0.42
173	0.22
Traj. #9	
513	0.87
384	0.51

Trajectory\
Template
Patient

Spawning reach: Imnaha R.

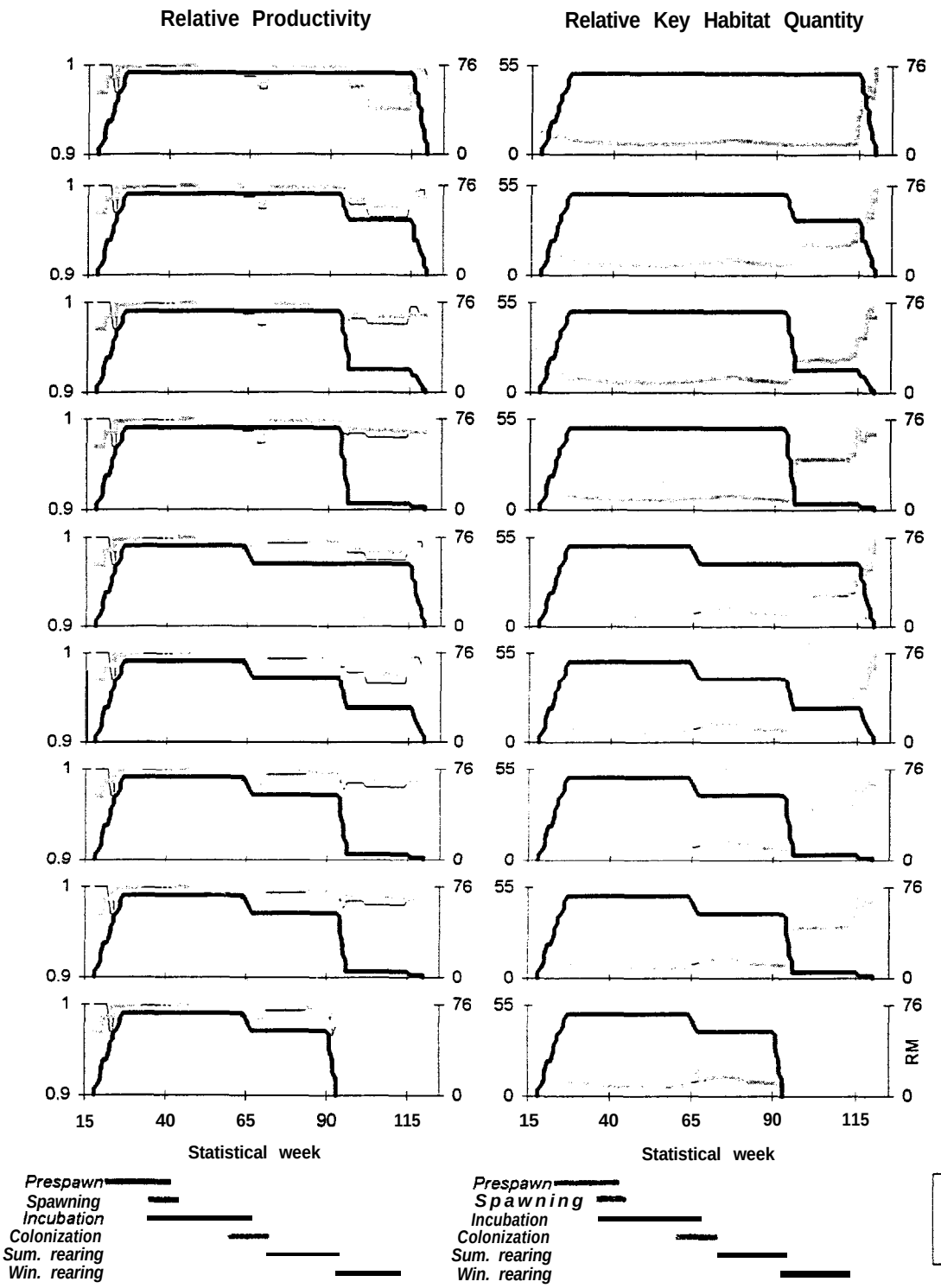
Skookum Cr - Blue Hole (RM 61.9 - 66.4 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
333	0.47
288	0.38
Traj. #2	
285	0.41
241	0.32
Traj. #3	
317	0.45
277	0.37
Traj. #4	
338	0.49
292	0.39
Traj. #5	
229	0.34
152	0.18
Traj. #6	
225	0.34
149	0.18
Traj. #7	
271	0.41
183	0.22
Traj. #8	
271	0.41
183	0.22
Traj. #9	
524	0.86
407	0.52

Spawning reach: Imnaha R.

Blue Hole - forks (RM 66.4 - 71.4 from Snake R)

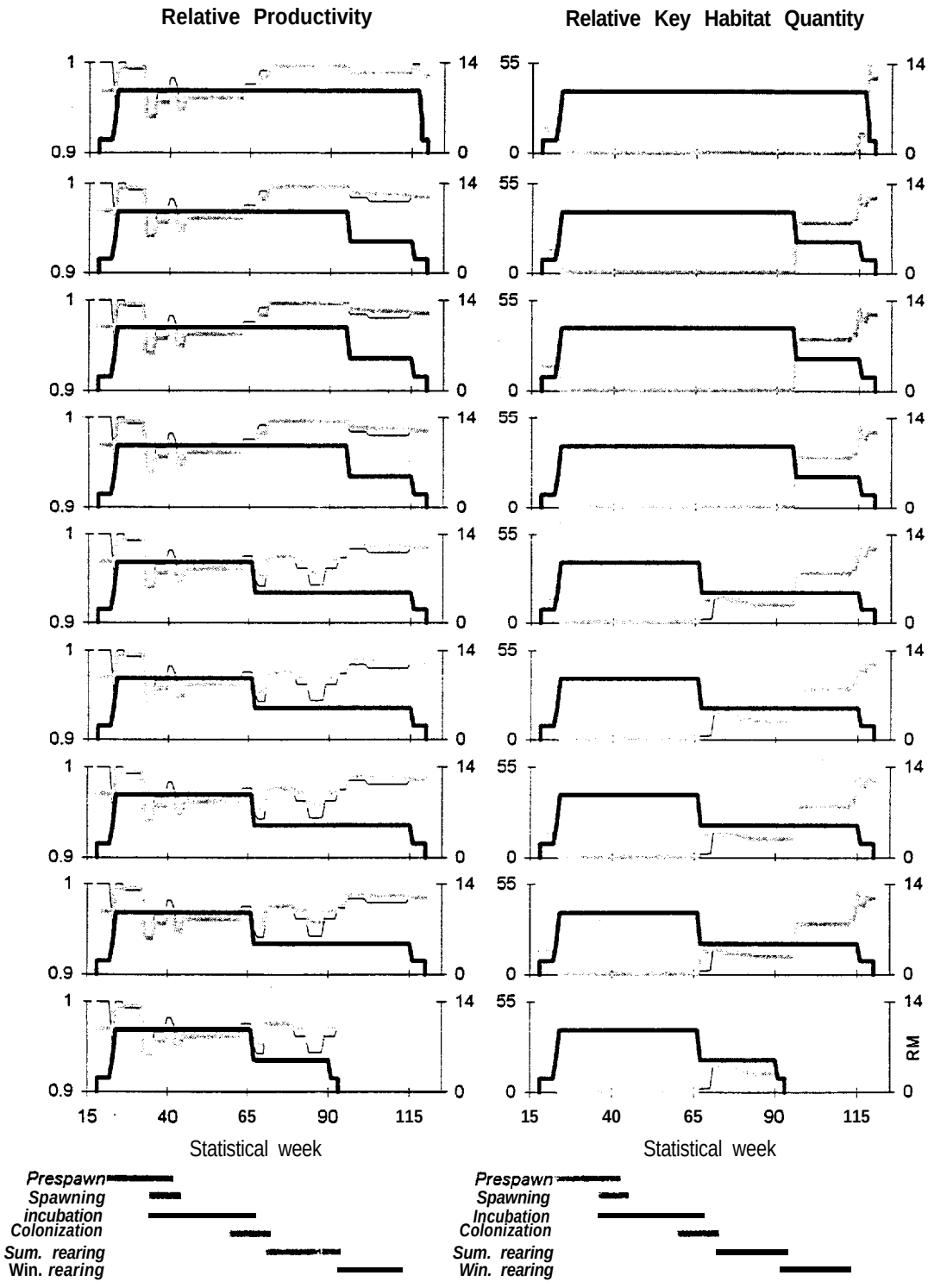


Template	
Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
201	0.25
236	0.25
Traj. #2	
287	0.38
285	0.32
Traj. #3	
318	0.42
328	0.37
Traj. #4	
339	0.46
343	0.39
Traj. #5	
328	0.46
325	0.39
Traj. #6	
279	0.39
270	0.32
Traj. #7	
335	0.47
328	0.40
Traj . #8	
335	0.47
328	0.40
Traj. #9	
637	0.98
715	0.94

Trajectory
Template
Patient

Spawning reach: Lightning Cr.

Mouth - forks (RM 5.4 - 13.9 from Snake R)

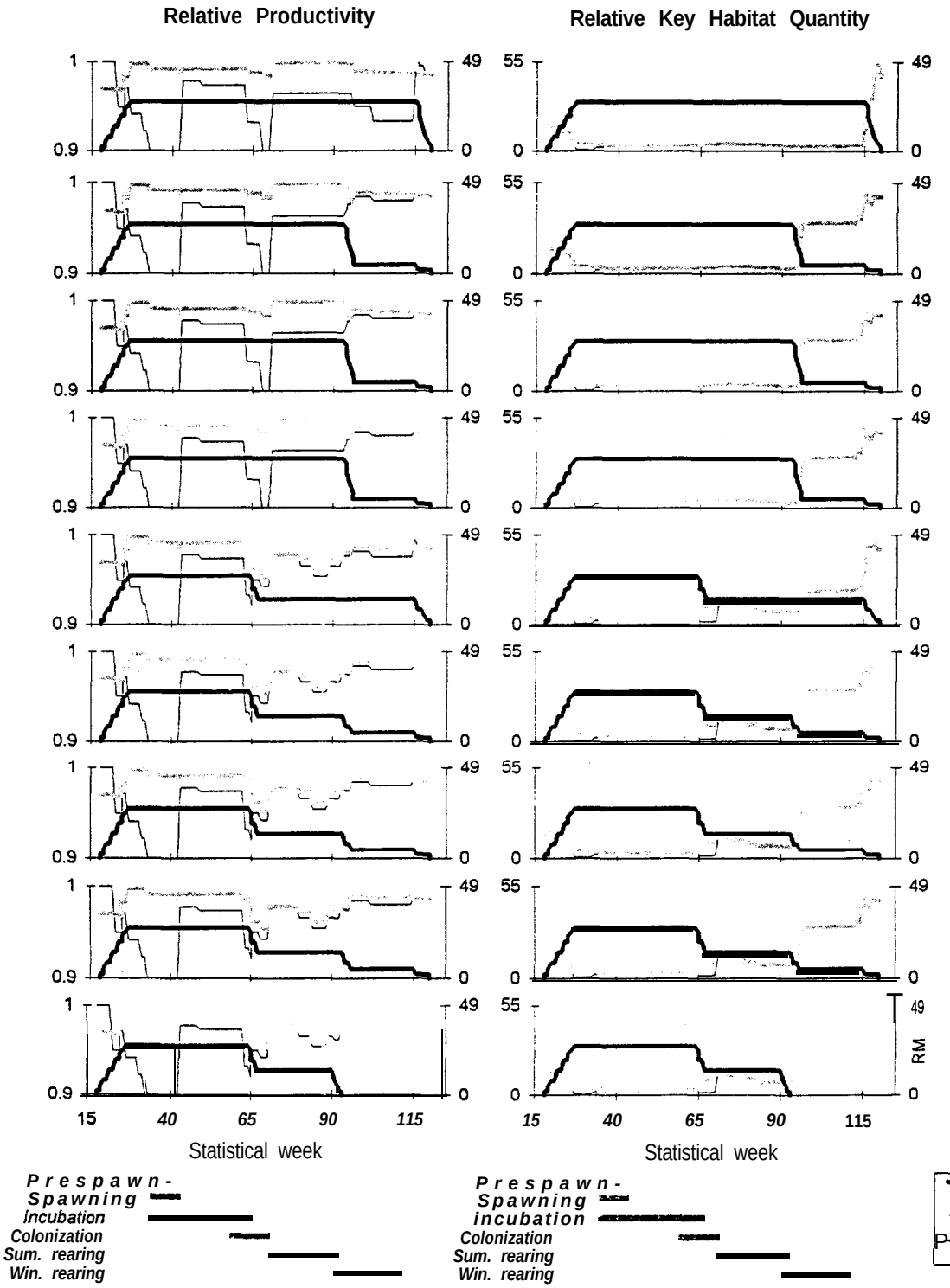


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
101	0.02
139	0.02
Traj. #2	
97	0.02
110	0.02
Traj. #3	
97	0.02
110	0.02
Traj. #4	
97	0.02
110	0.02
Traj. #5	
46	0.01
41	0.01
Traj. #6	
46	0.01
41	0.01
Traj. #7	
46	0.01
41	0.01
Traj. #8	
46	0.01
41	0.01
Traj. #9	
93	0.02
95	0.02

Trajectory
Template
Patient

Spawning reach: Little Sheep *Cr.*

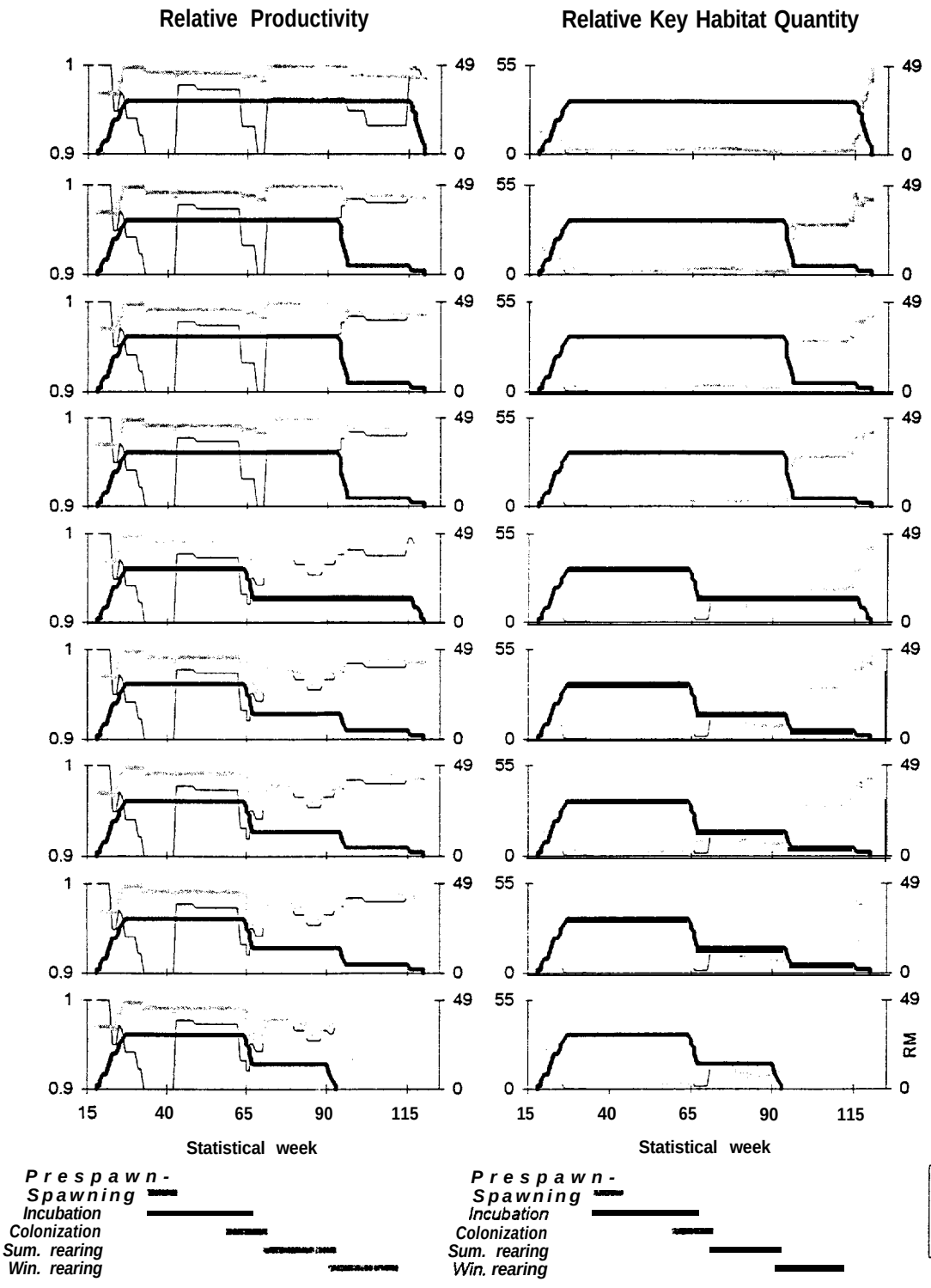
Mouth - Bear Gulch (RM 25.4 - 28.5 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
295	0.23
3	0.00
Traj. #2	
283	0.27
7	0.00
Traj. #3	
283	0.27
7	0.00
Traj. #4	
283	0.27
7	0.00
Traj. #5	
122	0.15
9	0.00
Traj. #6	
130	0.17
10	0.00
Traj. #7	
130	0.17
10	0.00
Traj. #8	
130	0.17
10	0.00
Traj. #9	
260	0.34
22	0.00

Spawning reach: Little Sheep Cr.

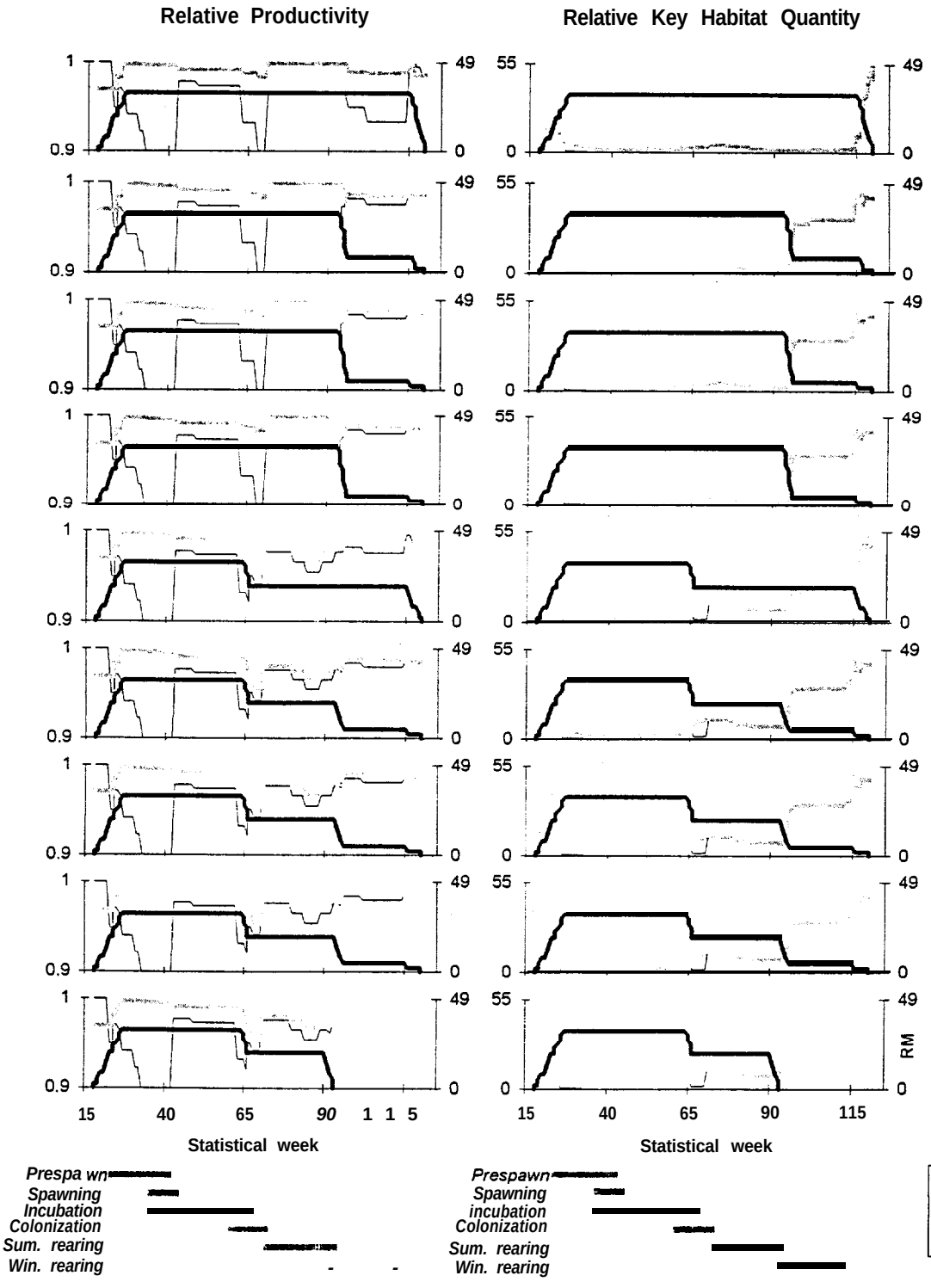
Bear Gulch - Devil's Gulch (RM 28.5 - 30.9 from Snake R)



Template	Patient
Cum. Prod.	Cum. Cap.
Traj. #1	
306	0.16
3	0.00
Traj. #2	
292	0.19
7	0.00
Traj. #3	
292	0.19
7	0.00
Traj. #4	
292	0.19
7	0.00
Traj. #5	
128	0.12
9	0.00
Traj. #6	
136	0.13
10	0.00
Traj. #7	
136	0.13
10	0.00
Traj. #8	
136	0.13
10	0.00
Traj. #9	
272	0.26
22	0.00

Spawning reach: Little Sheep Cr.

Devil's Gulch - Lightning Cr (RM 30.9 - 33.1 from Snake R)

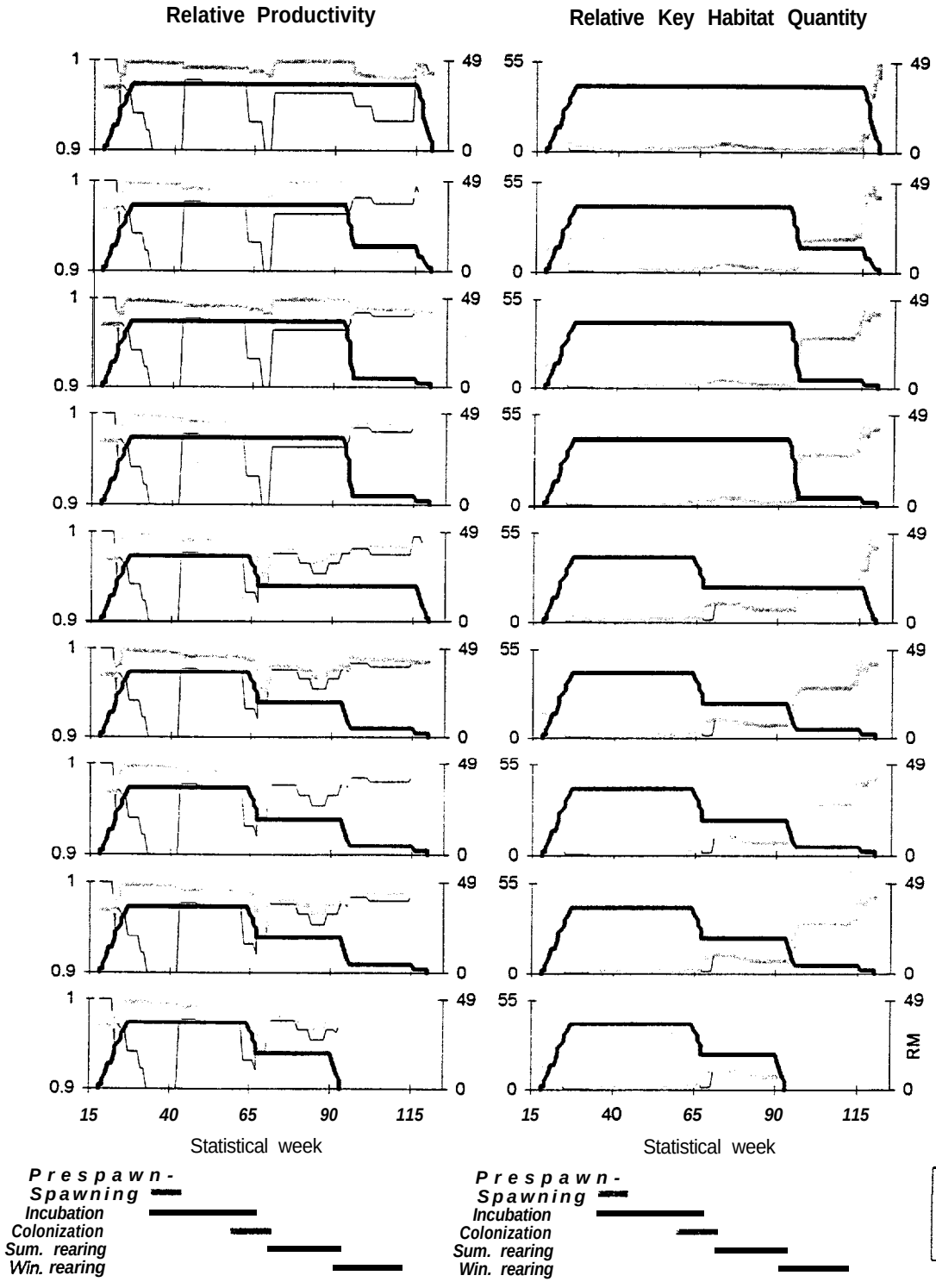


Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
327	0.17
3	0.00
Traj. #2	
295	0.19
7	0.00
Traj. #3	
313	0.21
7	0.00
Traj. #4	
313	0.21
7	0.00
Traj. #5	
151	0.14
9	0.00
Traj. #6	
160	0.15
10	0.00
Traj. #7	
160	0.15
10	0.00
Traj. #8	
160	0.15
10	0.00
Traj. #9	
318	0.30
22	0.01

Trajectory
Template
Patient

Spawning reach: Little Sheep Cr.

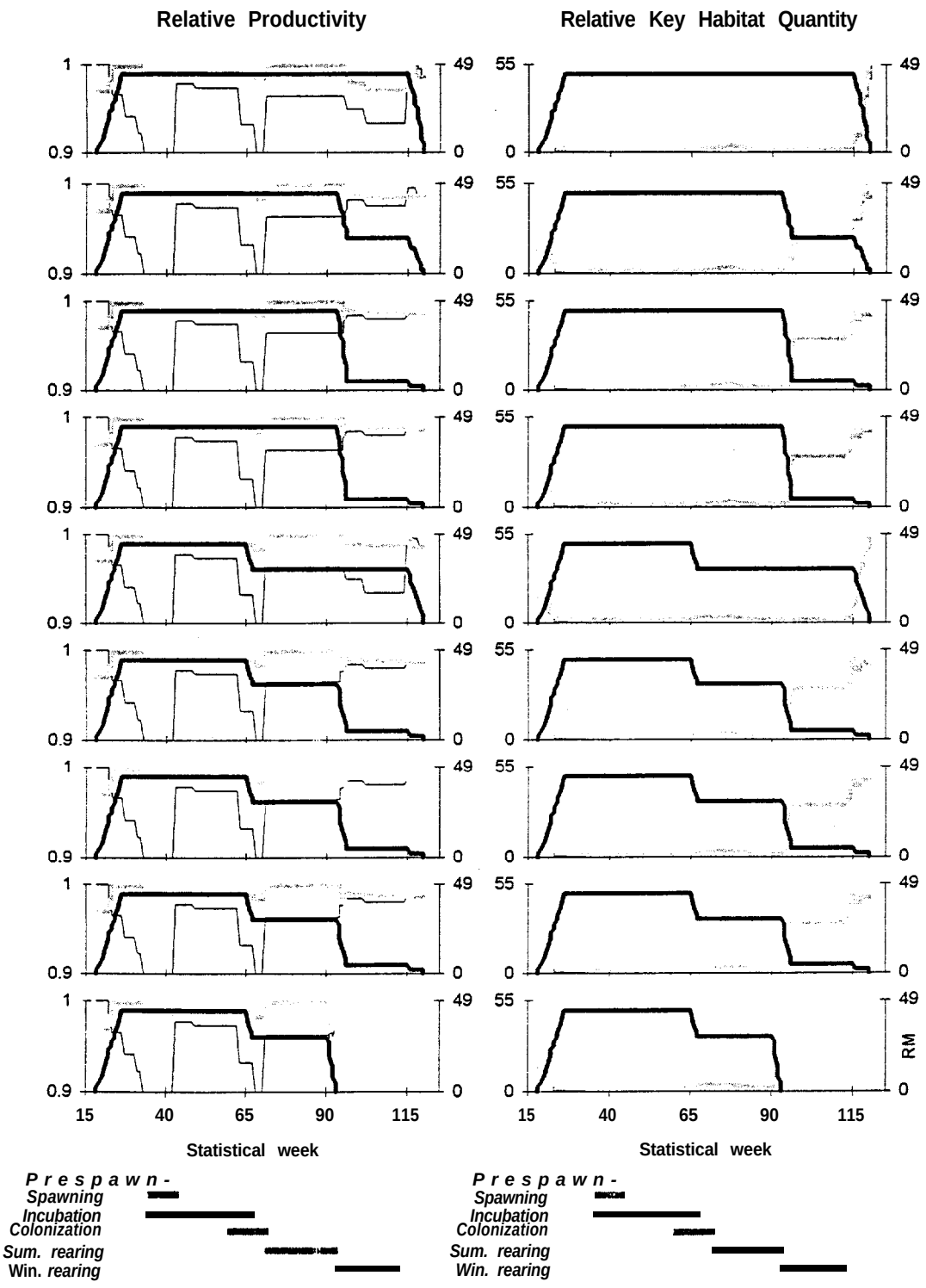
Lightning Cr - Hayden Cr (RM 33.1 - 38.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
295	0.14
3	0.00
Traj. #2	
306	0.18
7	0.00
Traj. #3	
324	0.20
7	0.00
Traj. #4	
324	0.20
7	0.00
Traj. #5	
160	0.13
9	0.00
Traj. #6	
169	0.14
10	0.00
Traj. #7	
169	0.14
10	0.00
Traj. #8	
169	0.14
10	0.00
Traj. #9	
336	0.29
22	0.00

Spawning reach: Little Sheep Cr.

Hayden Cr - McCully Cr (RM 38.8 - 48.8 from Snake R)



Template Patient	
Cum. Prod.	Cum. Cap.
Traj. #1	
250	0.11
3	0.00
Traj. #2	
304	0.15
7	0.00
Traj. #3	
320	0.16
7	0.00
Traj. #4	
320	0.16
7	0.00
Traj. #5	
328	0.14
3	0.00
Traj. #6	
313	0.17
7	0.00
Traj. #7	
313	0.17
7	0.00
Traj. #8	
313	0.17
7	0.00
Traj. #9	
588	0.35
17	0.00

APPENDIX C

Patient Template Analysis. Landscapes showing Key Habitat, Productivity, and Environmental Attributes for each Range

Patient Template Analysis: Landscapes showing Key Habitat, Productivity, and Environmental attributes for each stream reach range, listed in the order they appear in Appendix C.

Stream Reach Range	Zoom View
Grande Ronde R	
Chesnimnus Cr / Joseph R / Grande Ronde R	Chesnimnus Cr / Joseph R
Wenaha R / Grande Ronde R	Wenaha R
Wallowa R / Grande Ronde R	Wallowa R
Minam R / Wallowa R / Grande Ronde R	Minam R
Bear Cr / Wallowa R / Grande Ronde R	Bear Cr
Lostine R / Wallowa R / Grande Ronde R	Lostine R
Hurricane Cr / Wallowa R / Grande Ronde R	Hurricane Cr
OK Gulch Cr / Prairie Cr /Wallowa R / Grande Ronde R	OK Gulch Cr / Prairie Cr
Lookingglass Cr / Grande Ronde R	Lookingglass Cr.
Catherine Cr / Grande Ronde R	Catherine Cr
Sheep Cr / Grande Ronde R	Sheep Cr
Imnaha R	
Lightning Cr / Imnaha R	
Big Sheep Cr / Imnaha R	Big Sheep Cr
Little Sheep Cr / Big Sheep Cr / Imnaha R	Little Sheep Cr

Stream Reach Range

Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in the upper Grande Ronde River is greatly reduced for certain life stages compared to historic levels. Changes have been particularly severe throughout the Grande Ronde valley (- RM 95-120) for the prespawning, summer rearing, and overwintering stages. Slight to large changes have also occurred in many reaches upstream of the valley for all life stages except smolt. These losses are primarily due to land development, channel straightening and realignment, removal of large organic structure from the channel, and dewatering of the channel.

Changes in quantity of key habitat downstream of the valley have been comparatively minor.

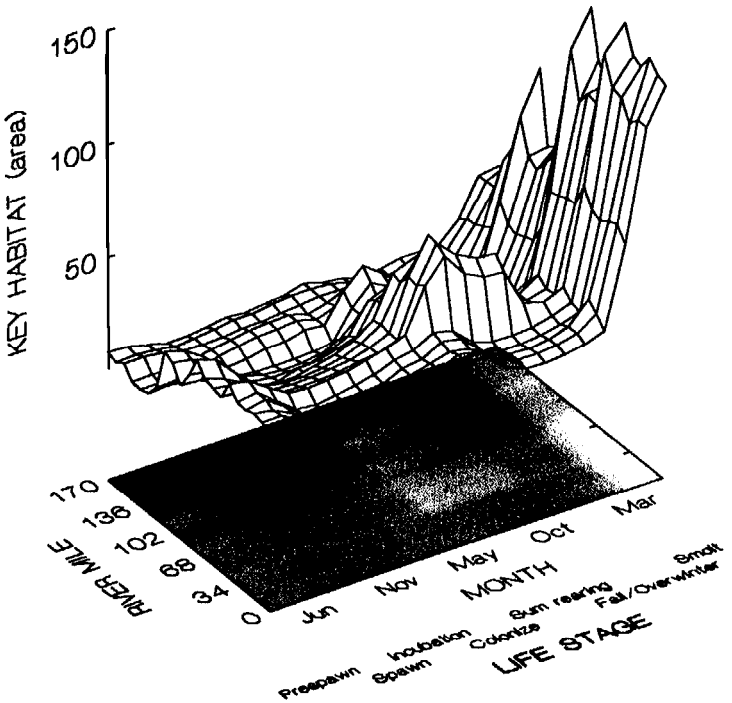
Relative Productivity (Survival)

The capability of the mainstem Grande Ronde River of supporting spring chinook productivity (survival) is greatly reduced for most life stages compared to historic conditions. This reduction has been most severe within the Grande Ronde valley and continues for most of the distance upstream. Survival conditions have also declined markedly downstream of the valley reaches, although historic conditions there were naturally poor for some life stages in the lower 50 miles. Current survival conditions remain similar to what they were historically for the prespawning and smolt life stages over most the of the river and in the over-wintering stage in some portions of the lower river.

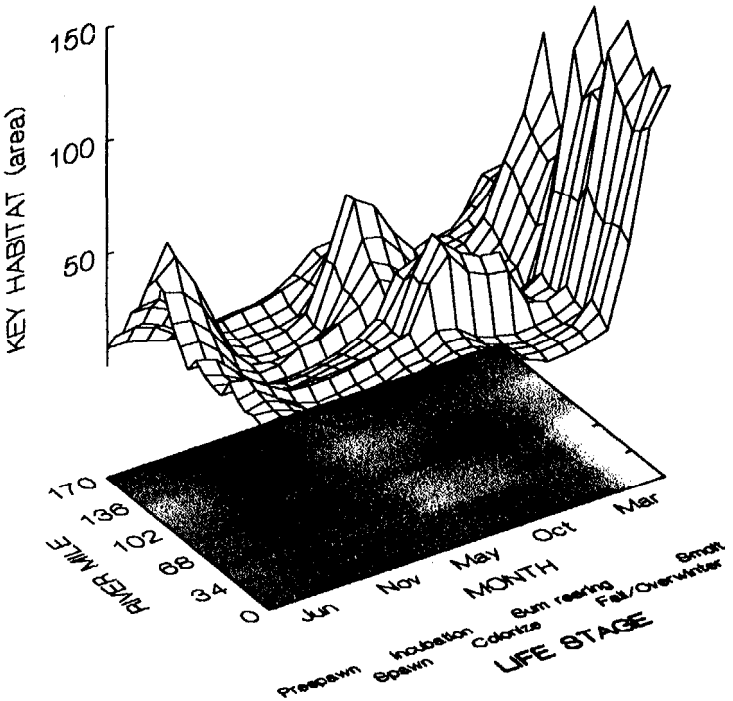
Survival conditions have changed in these reaches due primarily to increased water temperature, increased sediment load, loss in habitat diversity, changes in flow patterns, channel and bank destabilization, and alteration of the riparian zone.

Grande Ronde R Key Habitat Quantity

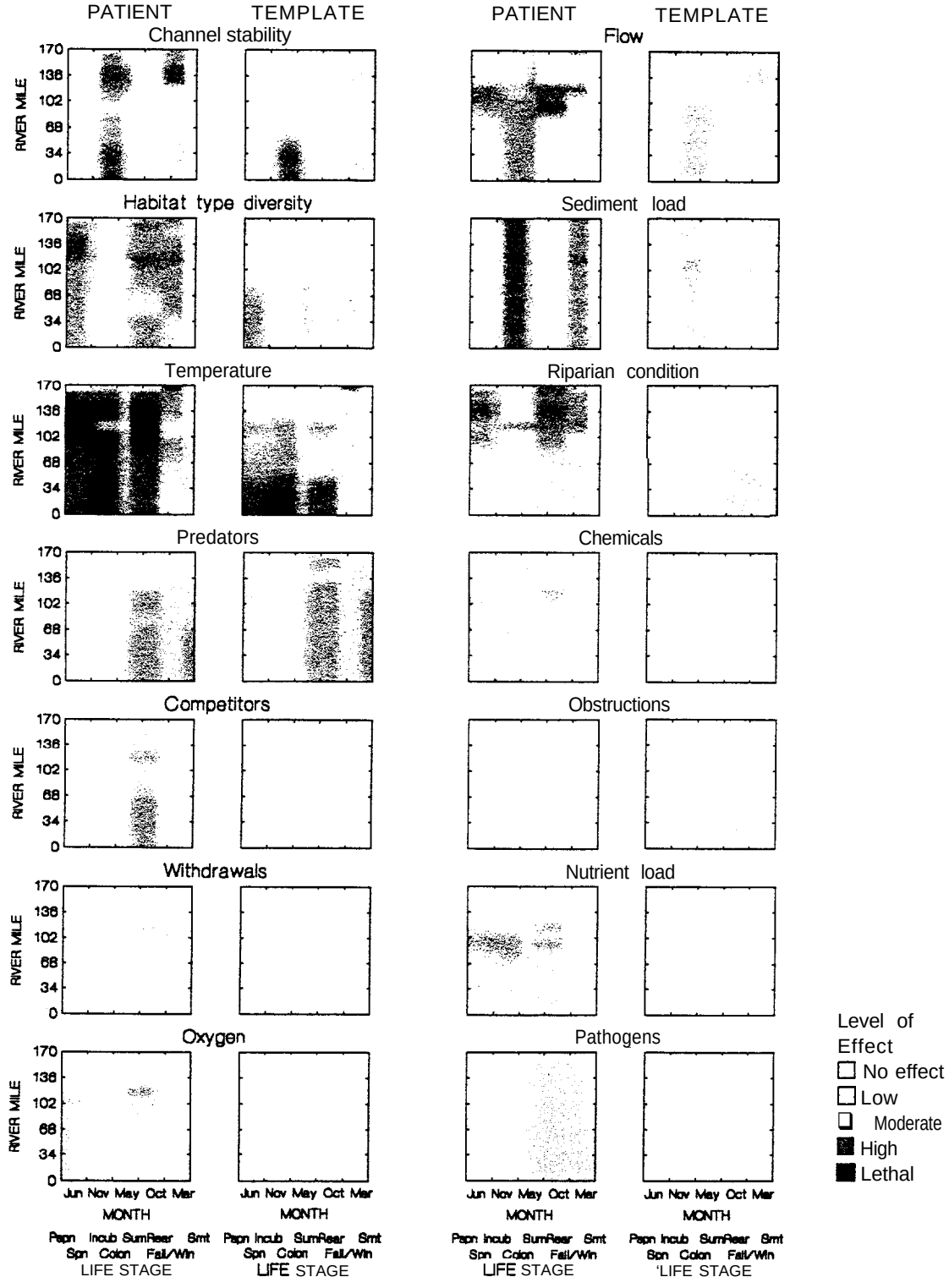
Patient



Template



Grande Ronde R Environmental Attributes

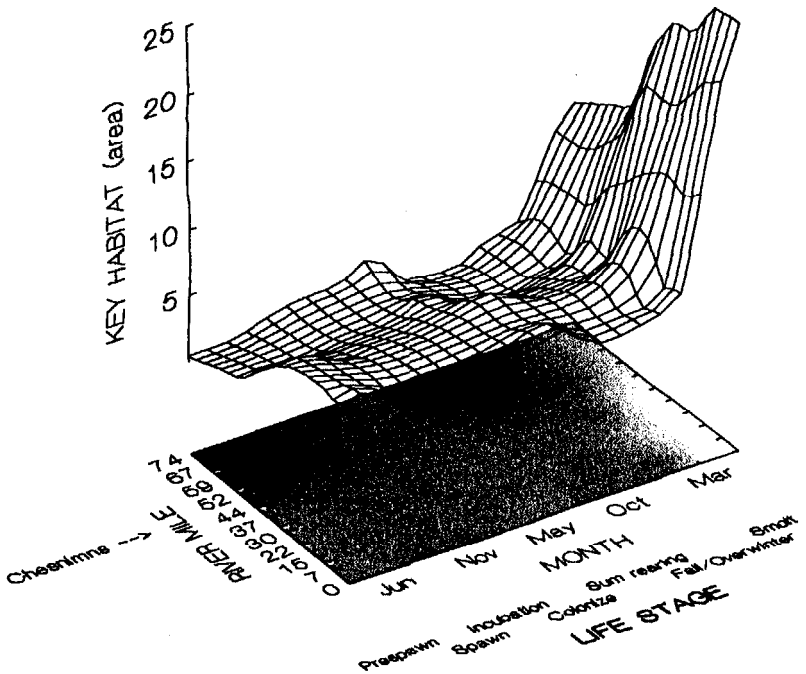


Level of Effect

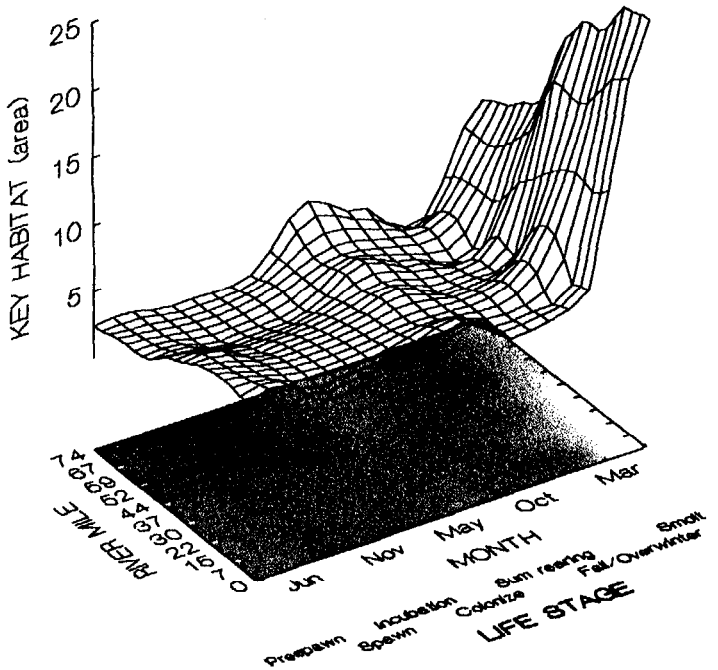
- No effect
- Low
- Moderate
- High
- Lethal

Chesnimnus Cr/Joseph Cr Key Habitat Quantity

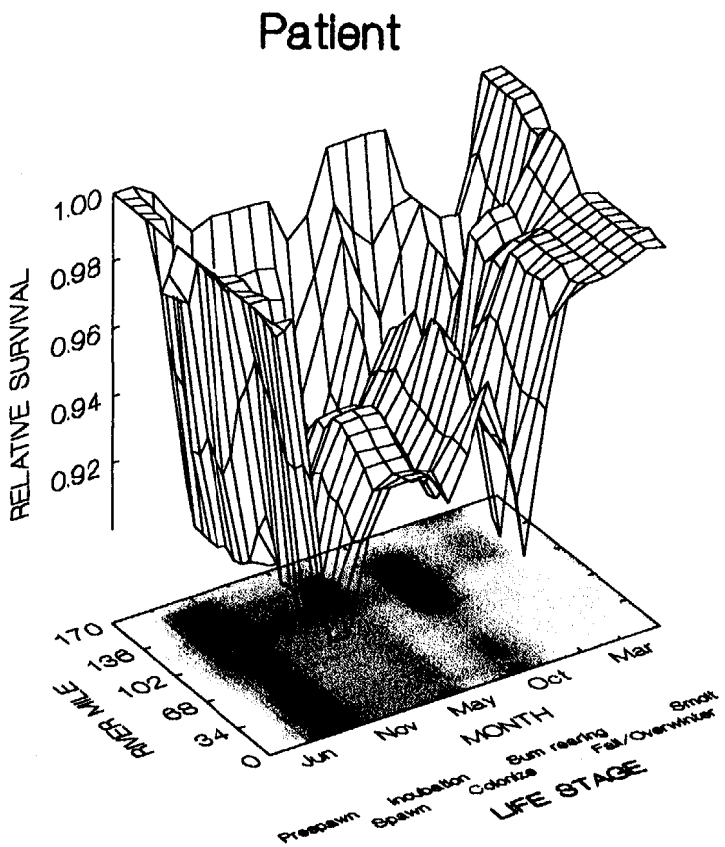
Patient

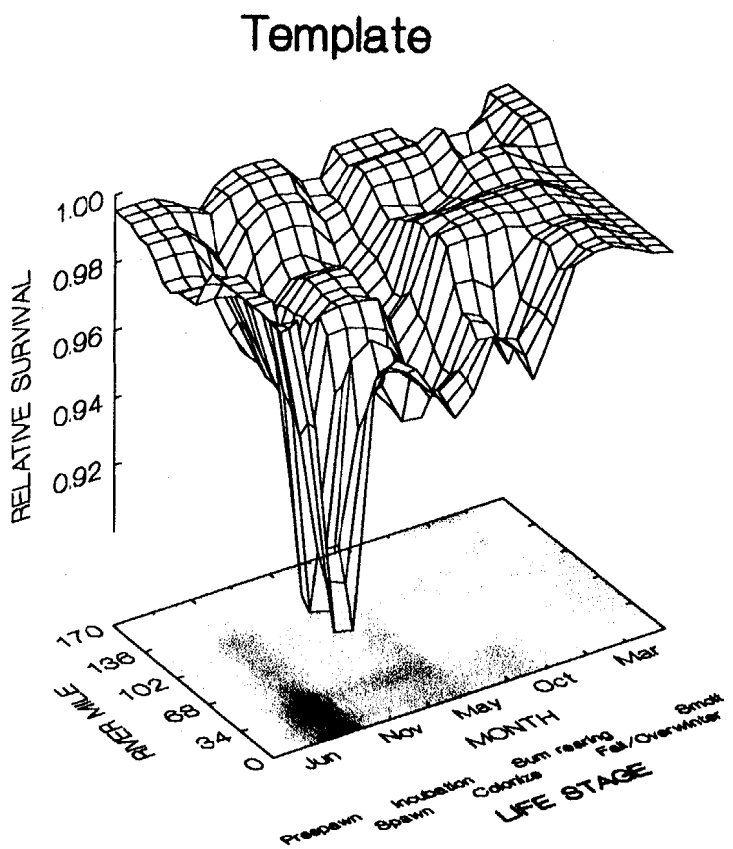


Template



Grande Ronde R Relative Survival





Patient-Template Analysis Summary

Stream Reach Range: Chesnimnus Cr./Joseph Cr./Grande Ronde R.

Key Habitat Quantity

Historically and continuing on to the present, the Joseph Creek subbasin has contained relatively little key habitat for spring chinook salmon.

Of the amount present, little change has occurred in the lower half of the drainage. A substantial loss has occurred in the upper reaches of the drainage, as seen in Chesnimnus Creek.

Relative Productivity (Survival)

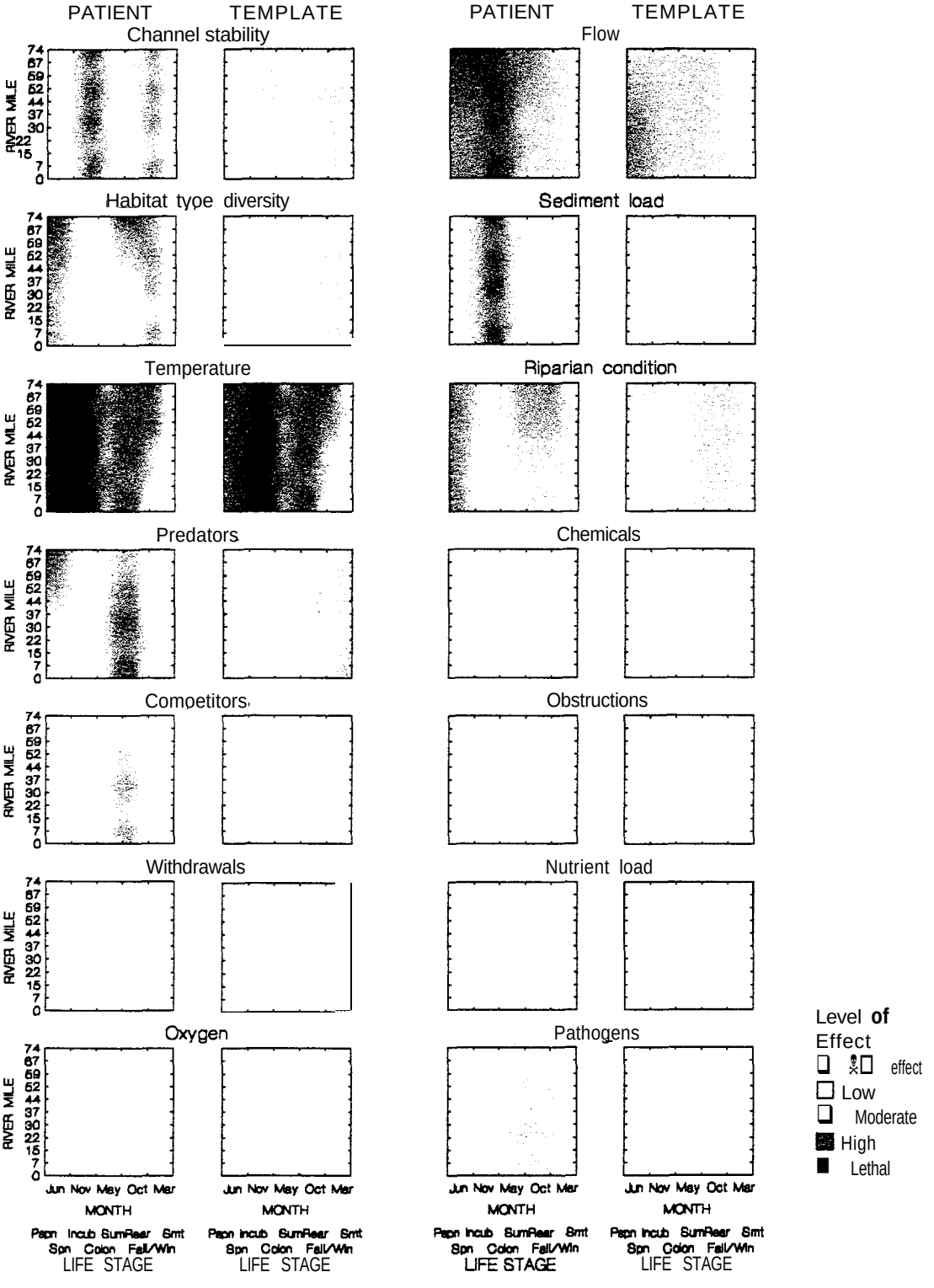
Although this reach range's capability of supporting spring chinook productivity (survival) has been reduced substantially over the past 150 years, conditions have never been favorable for this species. In particular, survival conditions for prespawning adults, spawners, and eggs have always been poor within Chesnimnus Creek, Joseph Creek, and downstream in the Grande Ronde River. These stream sections have apparently always had water temperature too high for good survival during these life stages.

Conditions for survival have worsened for the Patient because of changes that have occurred to channel stability, flow patterns, sediment load, habitat diversity, and predation levels.

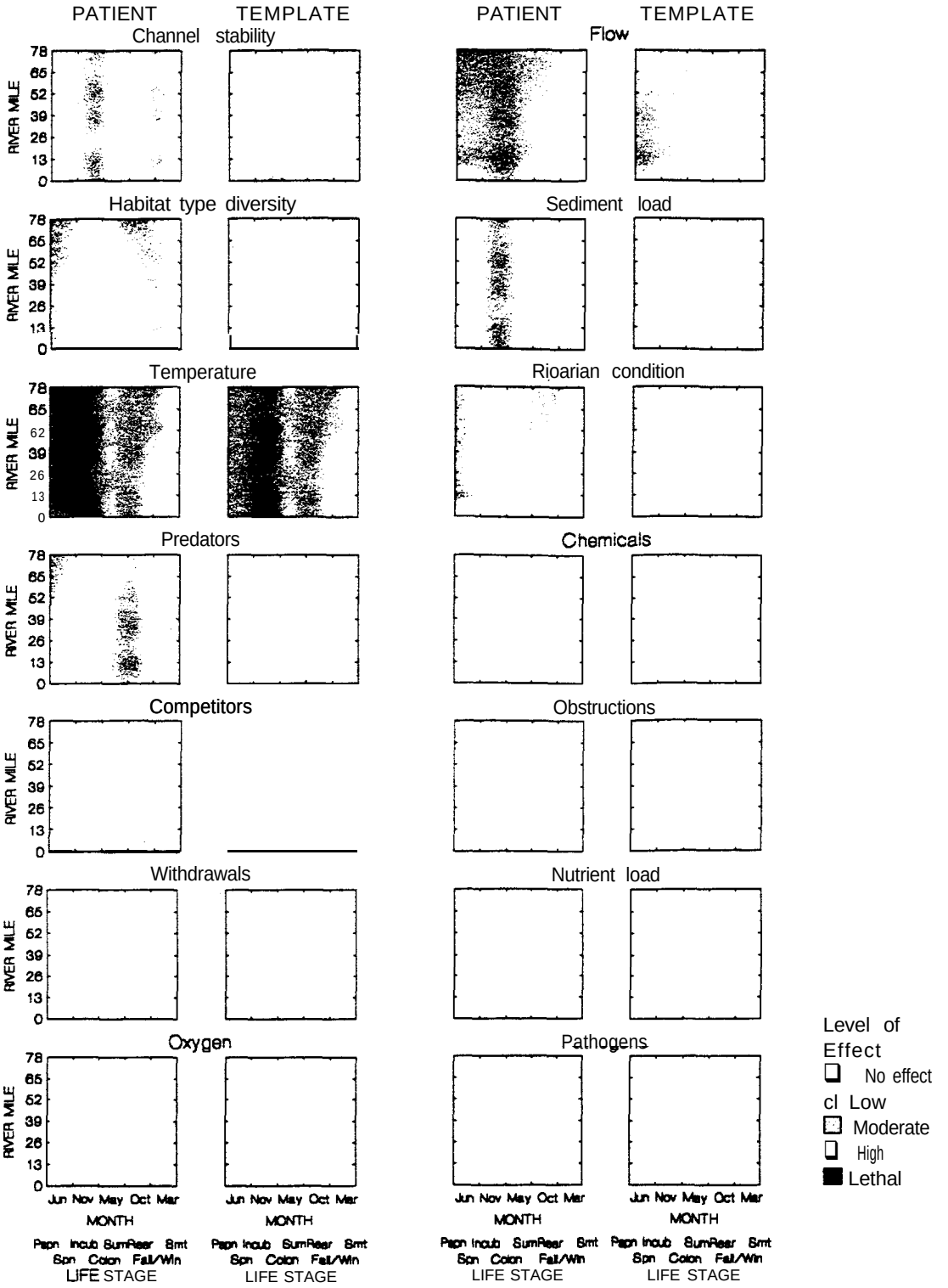
Stream Reach Range

Chesnimnus Cr / Joseph R / Grande Ronde R

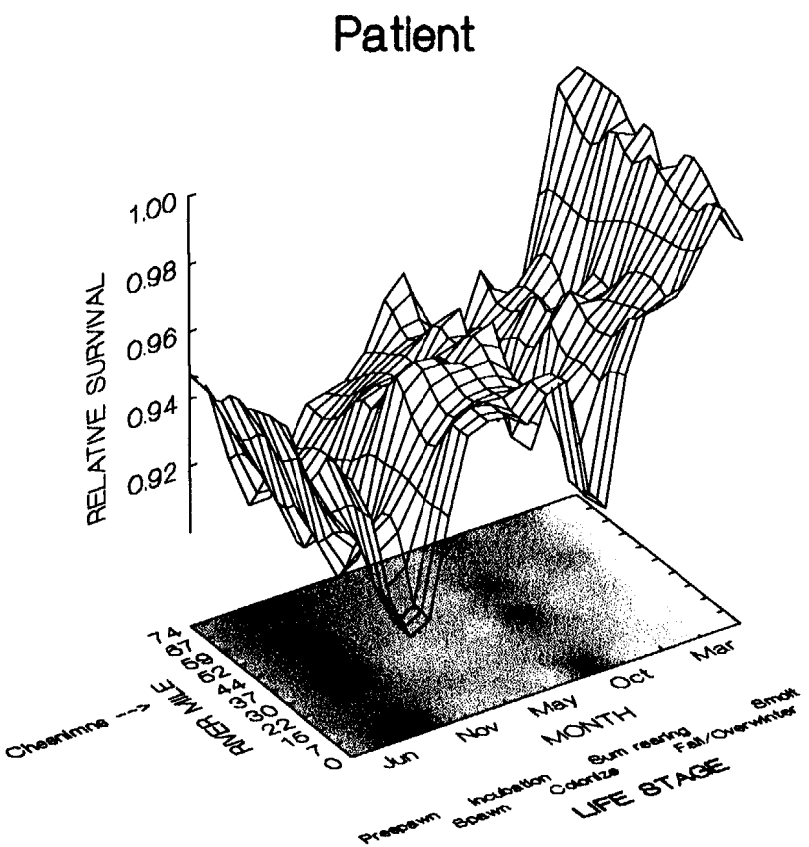
Chesnimnus Cr/Joseph Cr Environmental Attributes

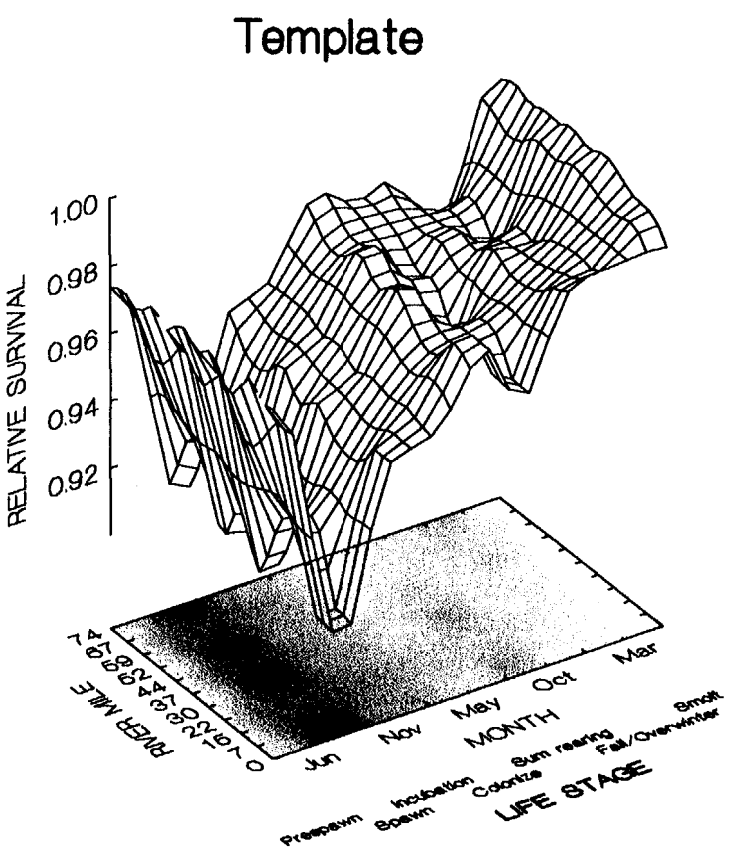


Chesnimnus Cr/Joseph Cr/Grande Ronde R
Environmental Attributes



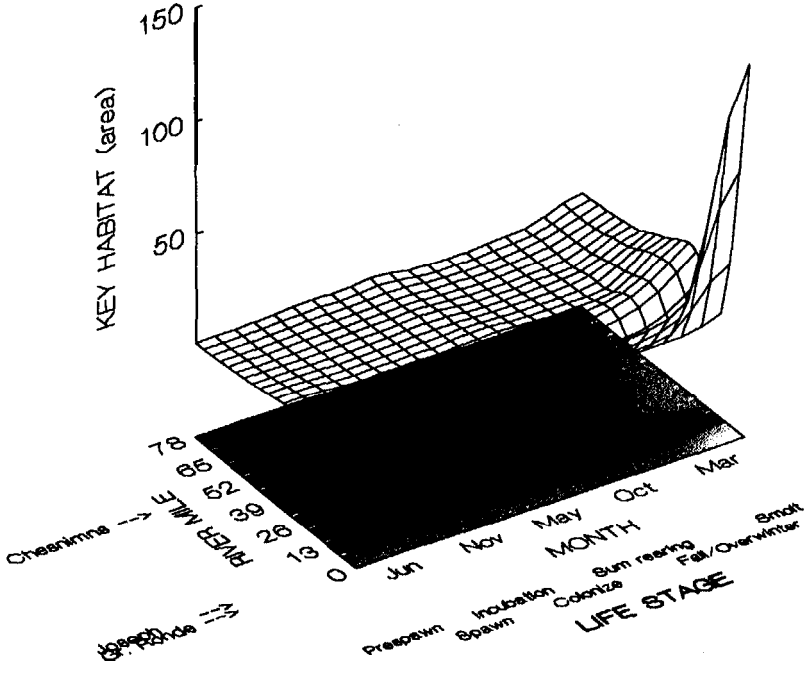
Chesnimnus Cr/Joseph Cr Relative Survival



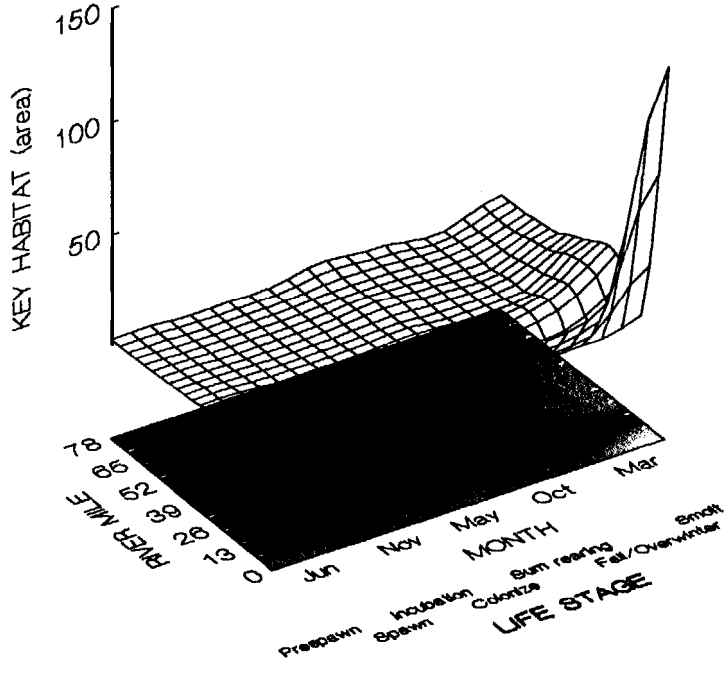


Chesnimnus Cr/Joseph Cr/Grande Ronde R Key Habitat Quantity

Patient

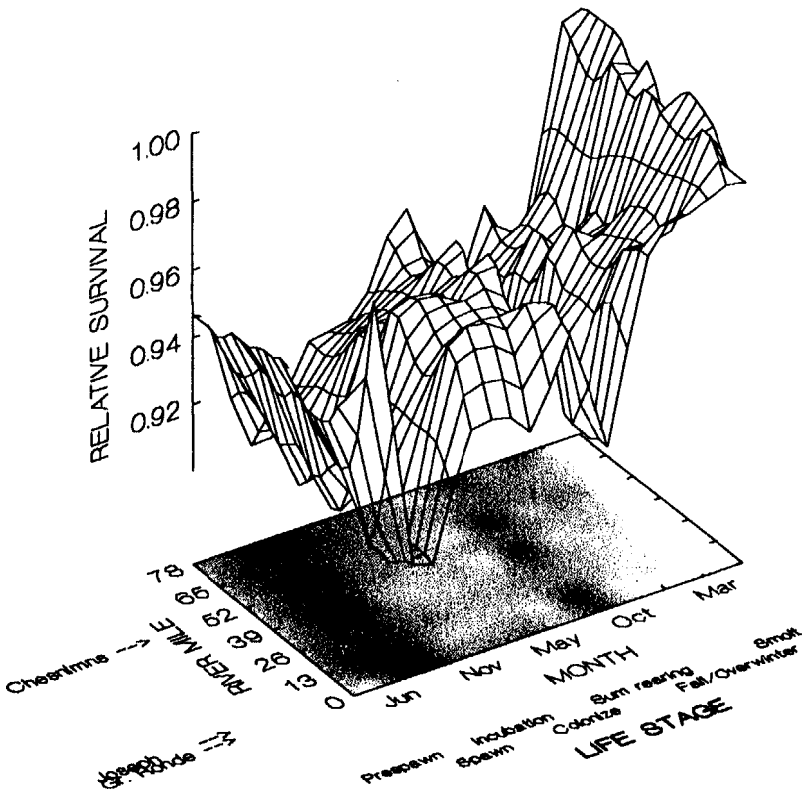


Template

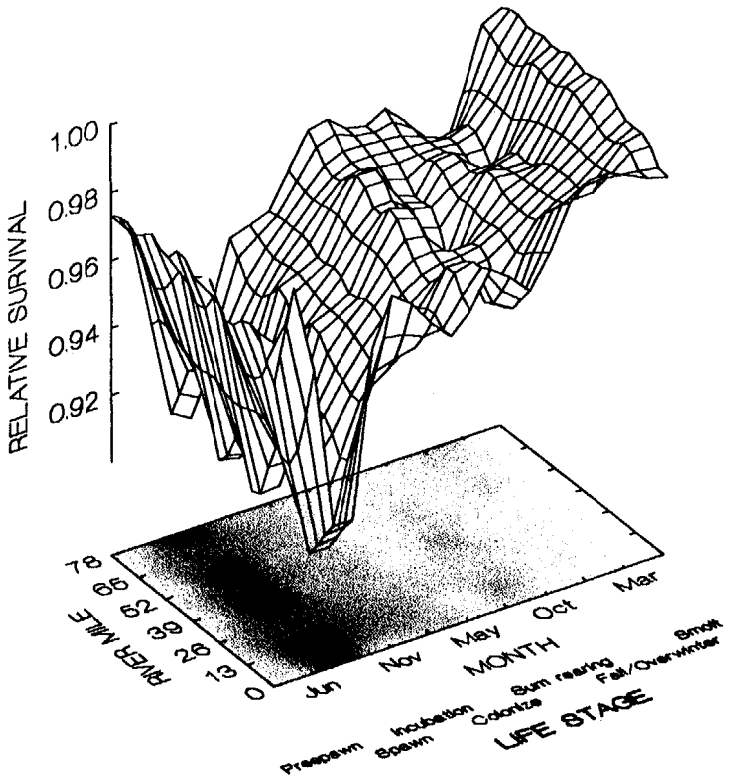


Chesnimnus Cr/Joseph Cr/Grande Ronde R Relative Survival

Patient



Template



Stream Reach Range

Wenaha R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Wenaha R./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in the Wenaha River is virtually unchanged compared to historic levels. The North Fork Wenaha River is not shown in the charts but its quantity of key habitat is comparable to that shown for the South Fork.

The quantity of key habitat in the Grande Ronde River downstream of the Wenaha River is also unchanged compared to historic levels. A greater amount of key habitat occurs in the mainstem Grande Ronde River than in the Wenaha River (for a given channel length) at most life stages.

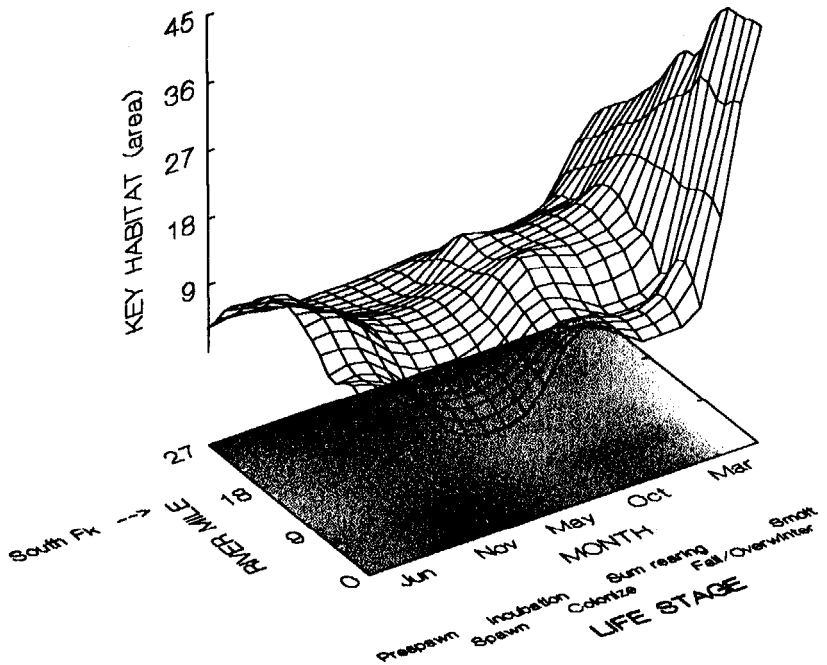
Relative Productivity (Survival)

The capability of the mainstem Wenaha River of supporting spring chinook productivity (survival) is virtually unchanged compared to historic conditions. In general, survival conditions are excellent over approximately the upper half of the Wenaha River, including its forks. The lower 14 miles of mainstem have conditions less favorable for survival, with conditions particularly poor for prespawners, spawners, and egg incubation downstream of about river mile 7.

Survival conditions within the Grande Ronde River downstream of the Wenaha River have worsened compared to those that existed historically, although these reaches have always been unfavorable for survival during some life stages. In particular, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Wenaha R Key Habitat Quantity

Patient



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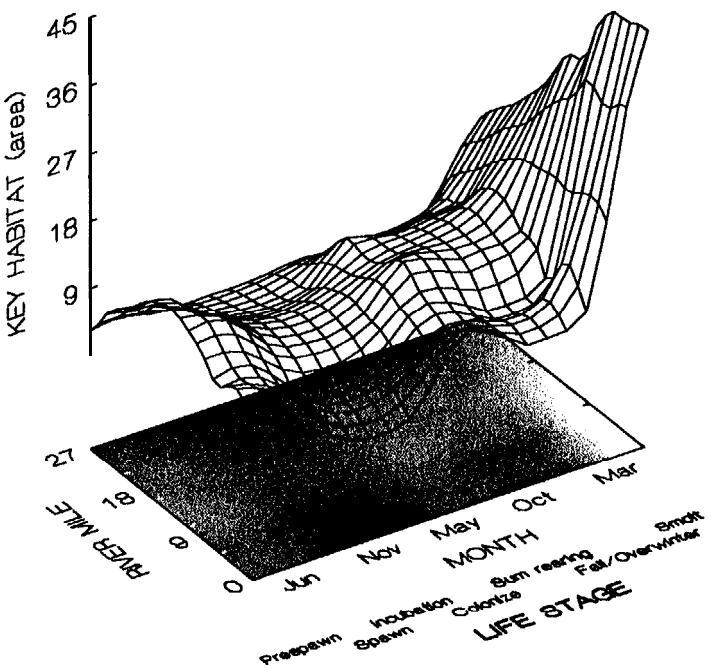
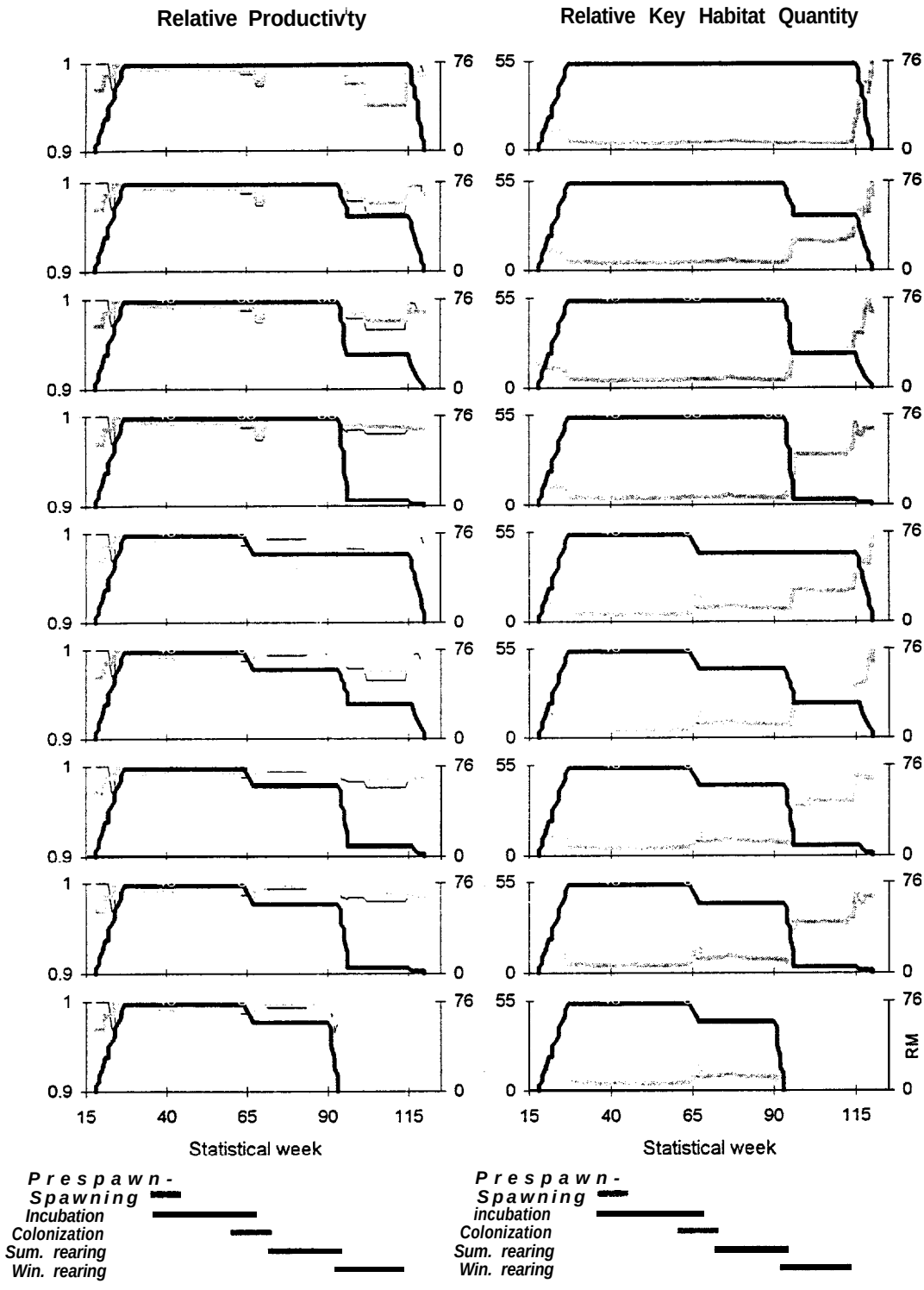


Spawning reach: Imnaha R.

South Fork Imnaha R (RM 71.4 - 76.1 from Snake R)



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Cum. Prod.	Cum. Cap.
Traj. #1	
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238	0.19
Traj. #2	
288	0.29
288	0.25
Traj. #3	
280	0.29
281	0.25
Traj. #4	
340	0.35
346	0.30
Traj. #5	
332	0.38
327	0.33
Traj. #6	
280	0.33
272	0.27
Traj. #7	
316	0.37
308	0.31
Traj. #8	
336	0.40
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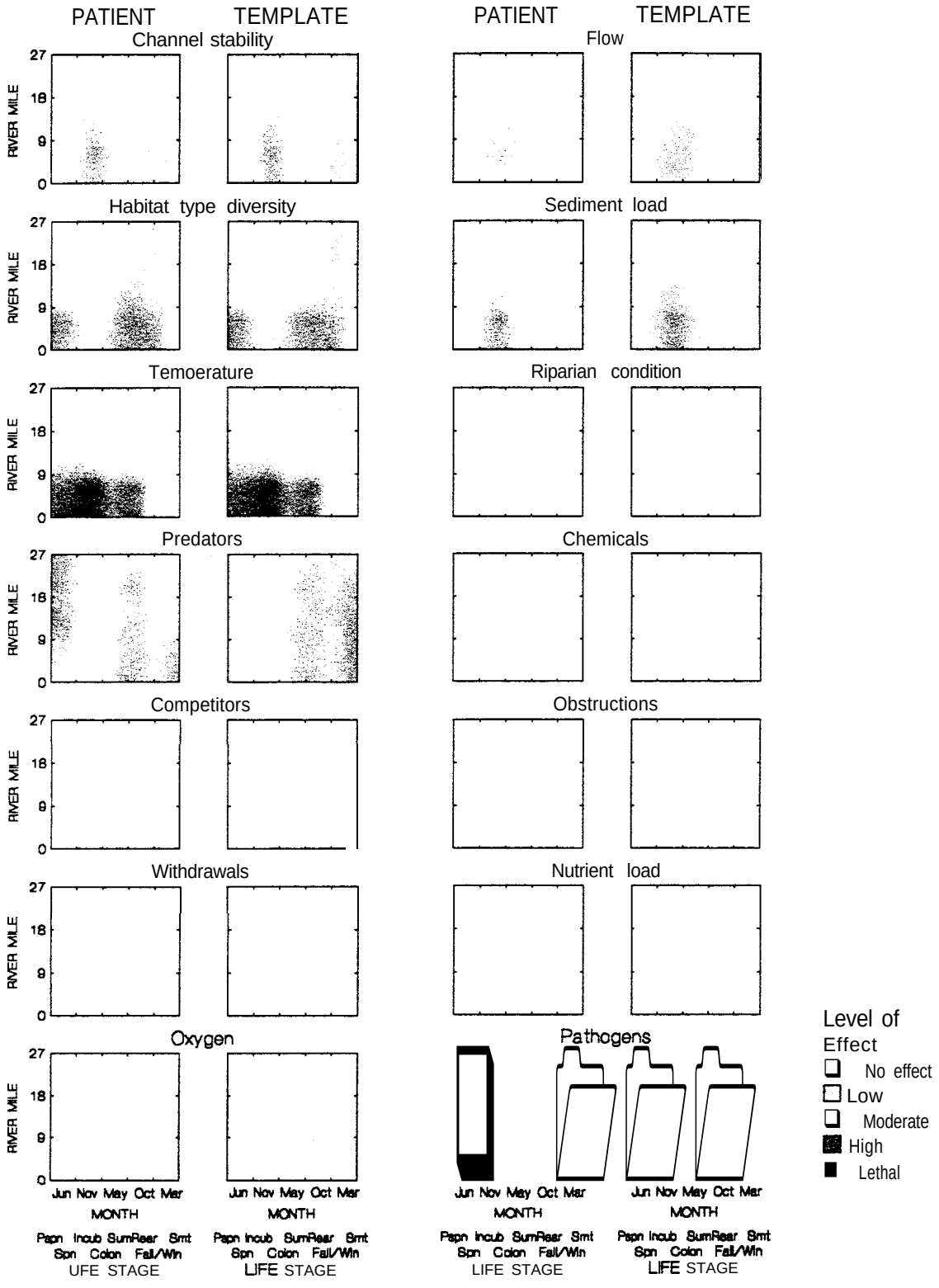
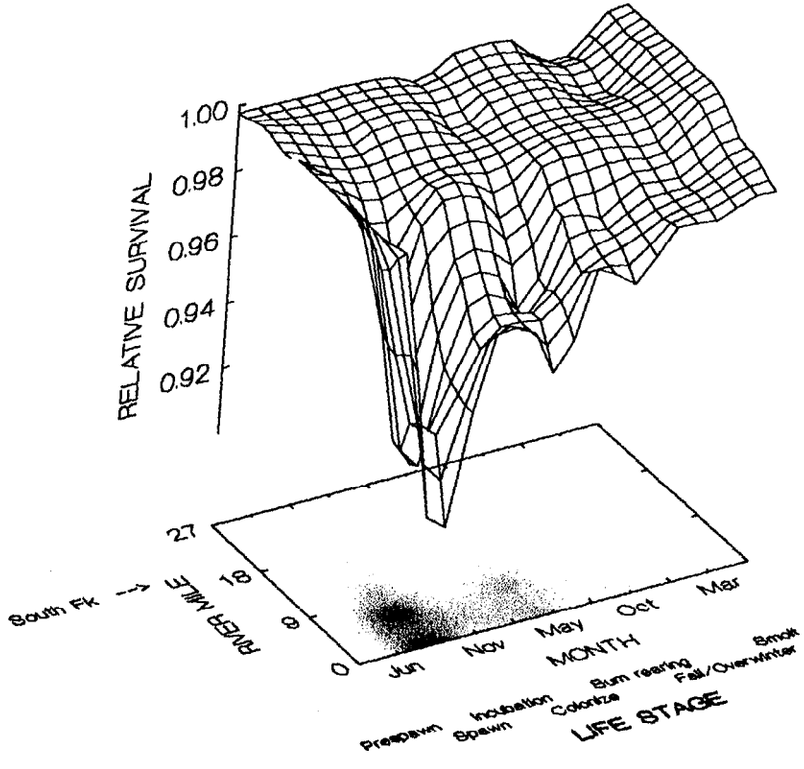
Traj. #9	
638	0.81
718	0.78

Wenaha R Environmental Attributes



Wenaha R Relative Survival

Patient



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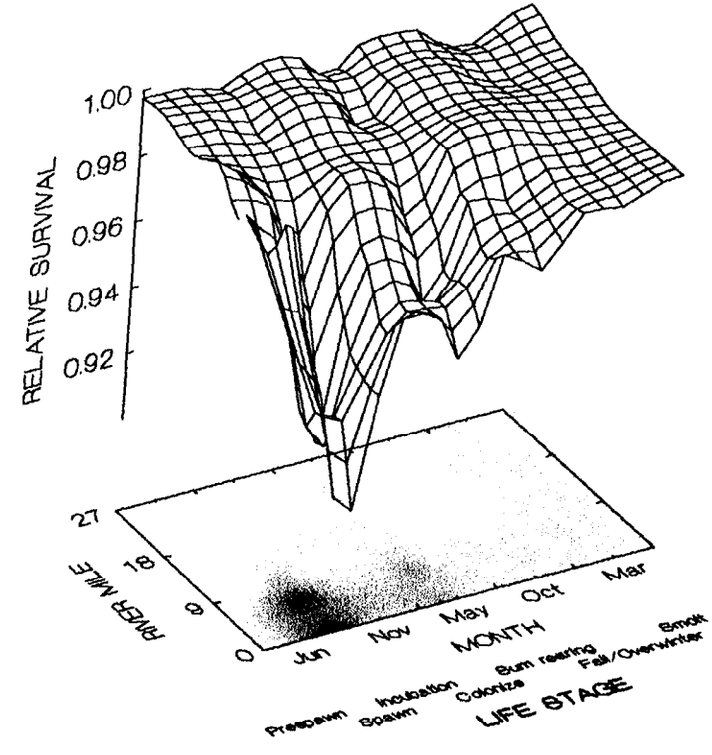
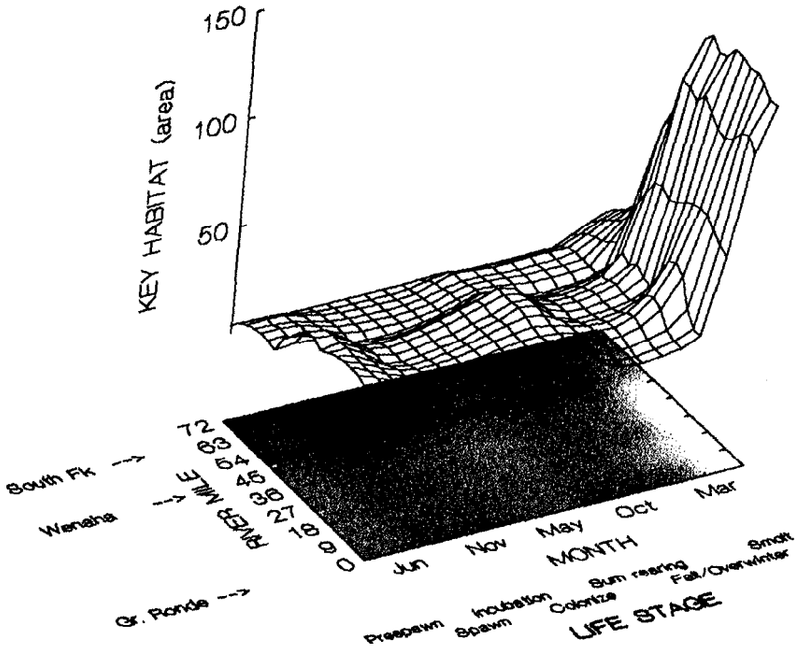


Wenaha R/Grande Ronde R Key Habitat Quantity

Patient



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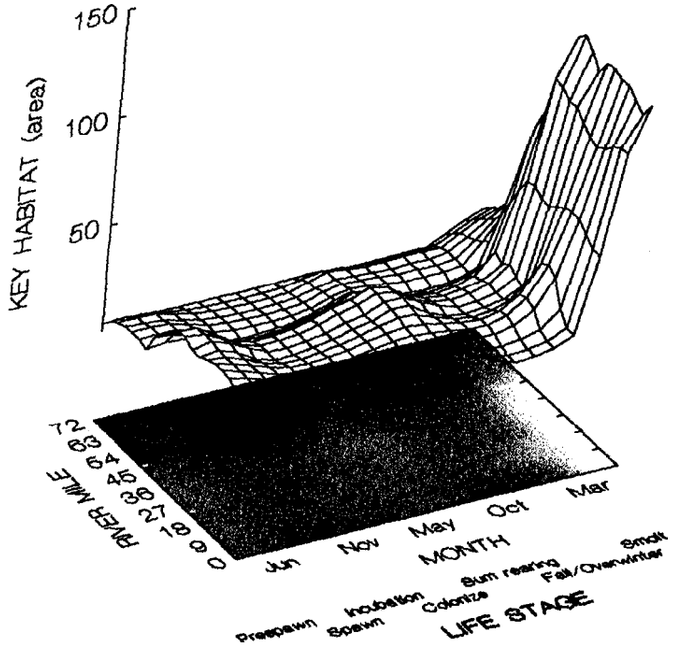
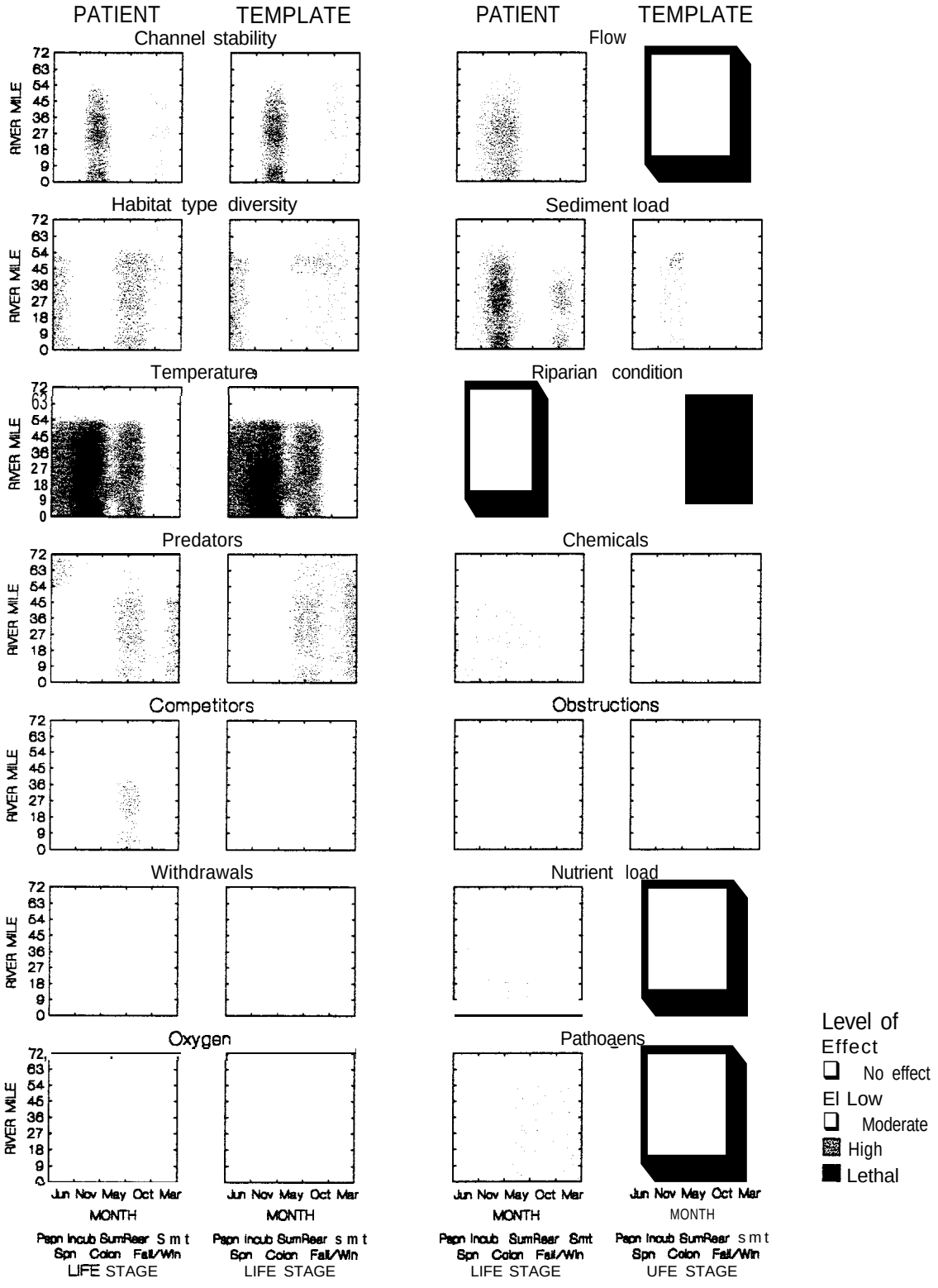
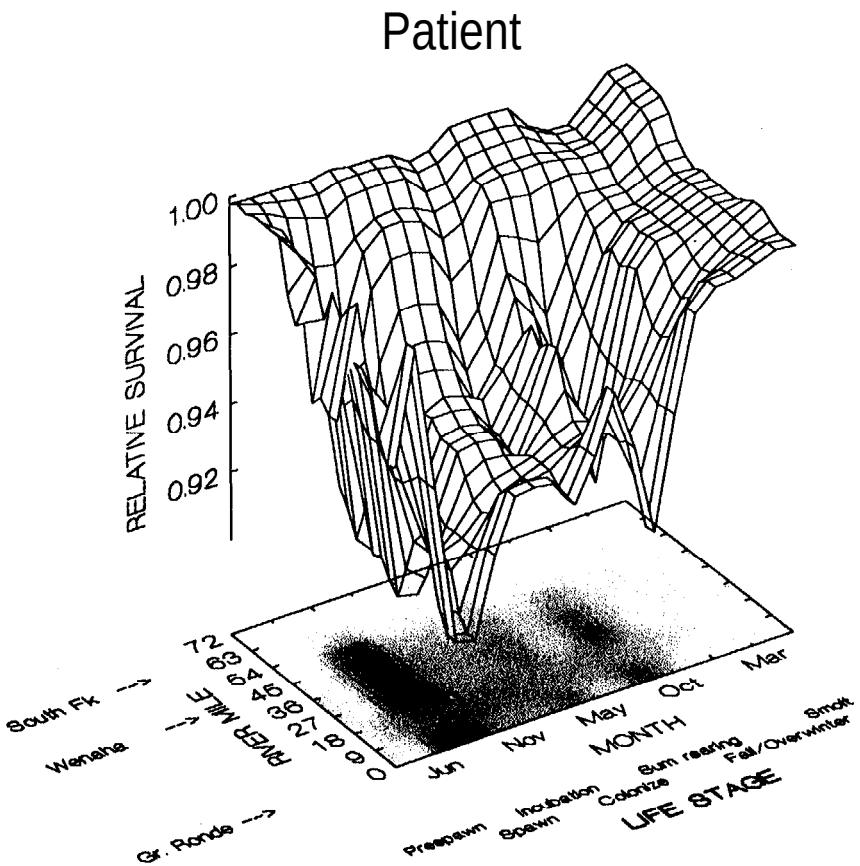
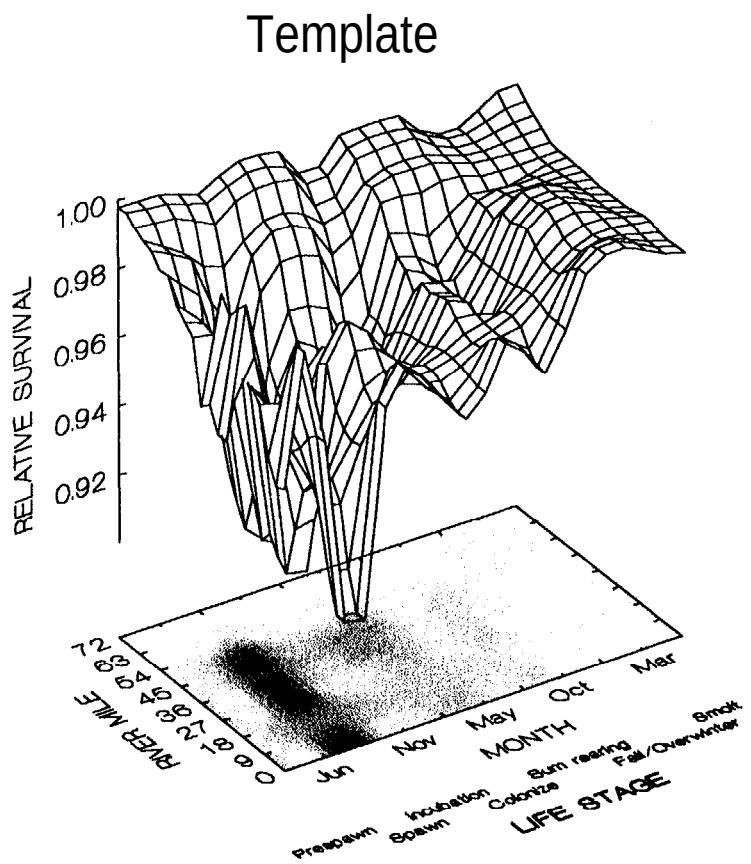


Wenaha R/Grande Ronde R Environmental Attributes



Wenaha R/Grande Ronde R Relative Survival





Stream Reach Range

Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Wallowa R./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for most life stages of spring chinook throughout most of the mainstem Wallowa River has been substantially reduced compared to historic levels. Only habitat for the smolt stage has been largely unaffected. Habitat quantities in the lower ten miles (downstream of Minam River) are relatively unchanged for all life stages, however.

The quantity of key habitat in the Grande Ronde River downstream of the Wallowa River is nearly unchanged compared to historic levels.

Relative Productivity (Survival)

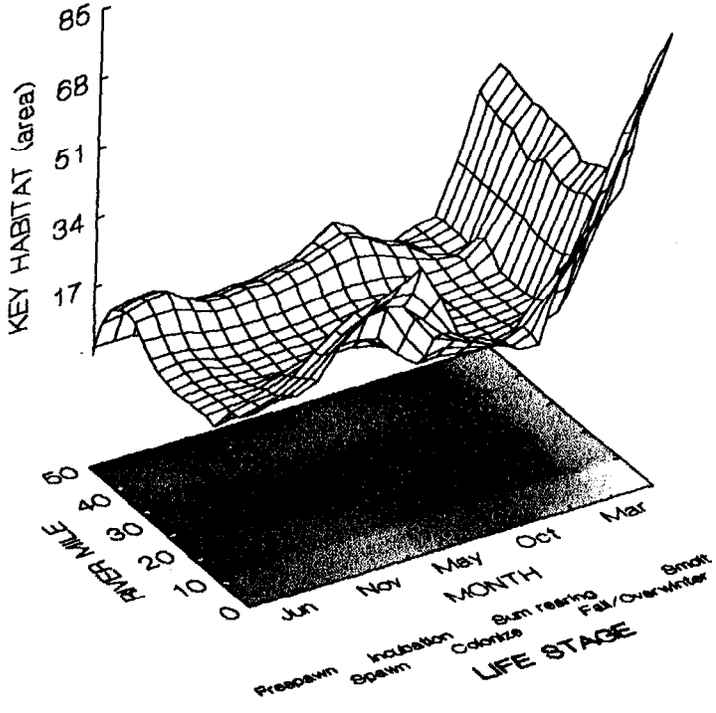
The capability of the mainstem Wallowa River of supporting spring chinook productivity (survival) is sharply reduced compared to historic conditions for several life stages. Historically, all but approximately the lower 15 miles of this river had conditions for spring chinook survival that were likely the best in the entire Grande Ronde basin. This was due to moderating effects of Wallowa Lake on environmental attributes that typically increase mortality in streams not influenced by large lakes. Currently, conditions for survival during egg incubation, fry colonization, and early summer rearing are poorest high in the system, with conditions tending to improve downstream. Survival conditions have been worsened due to alterations in most environmental attributes, most notably, sediment load, nutrient load, and habitat diversity.

Survival conditions within the Grande Ronde River downstream of the Wallowa River have worsened compared to those that existed historically, although these reaches have always been largely unfavorable for survival during some life stages. In particular, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Note: Spring chinook salmon are not believed to have ever spawned in the Wallowa River upstream of Wallowa Lake.

Wallowa R Key Habitat Quantity

Patient



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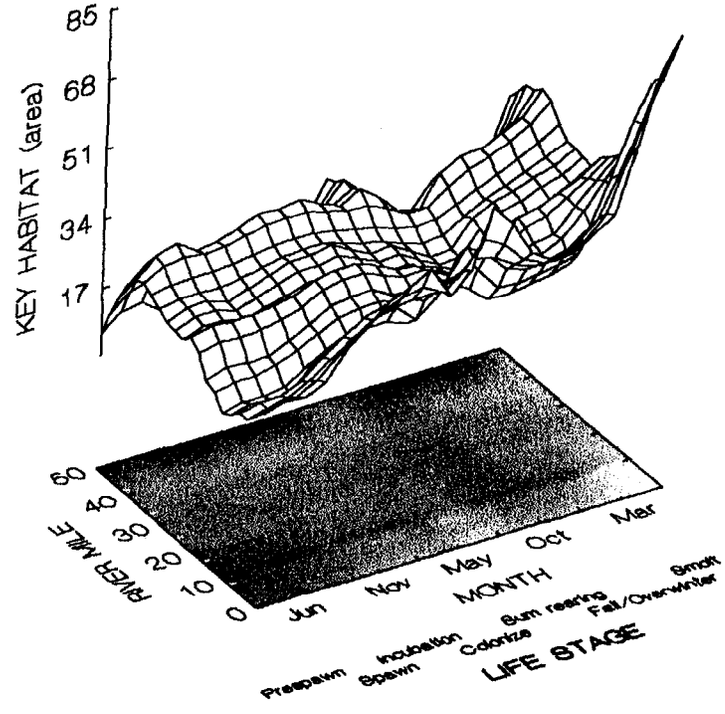
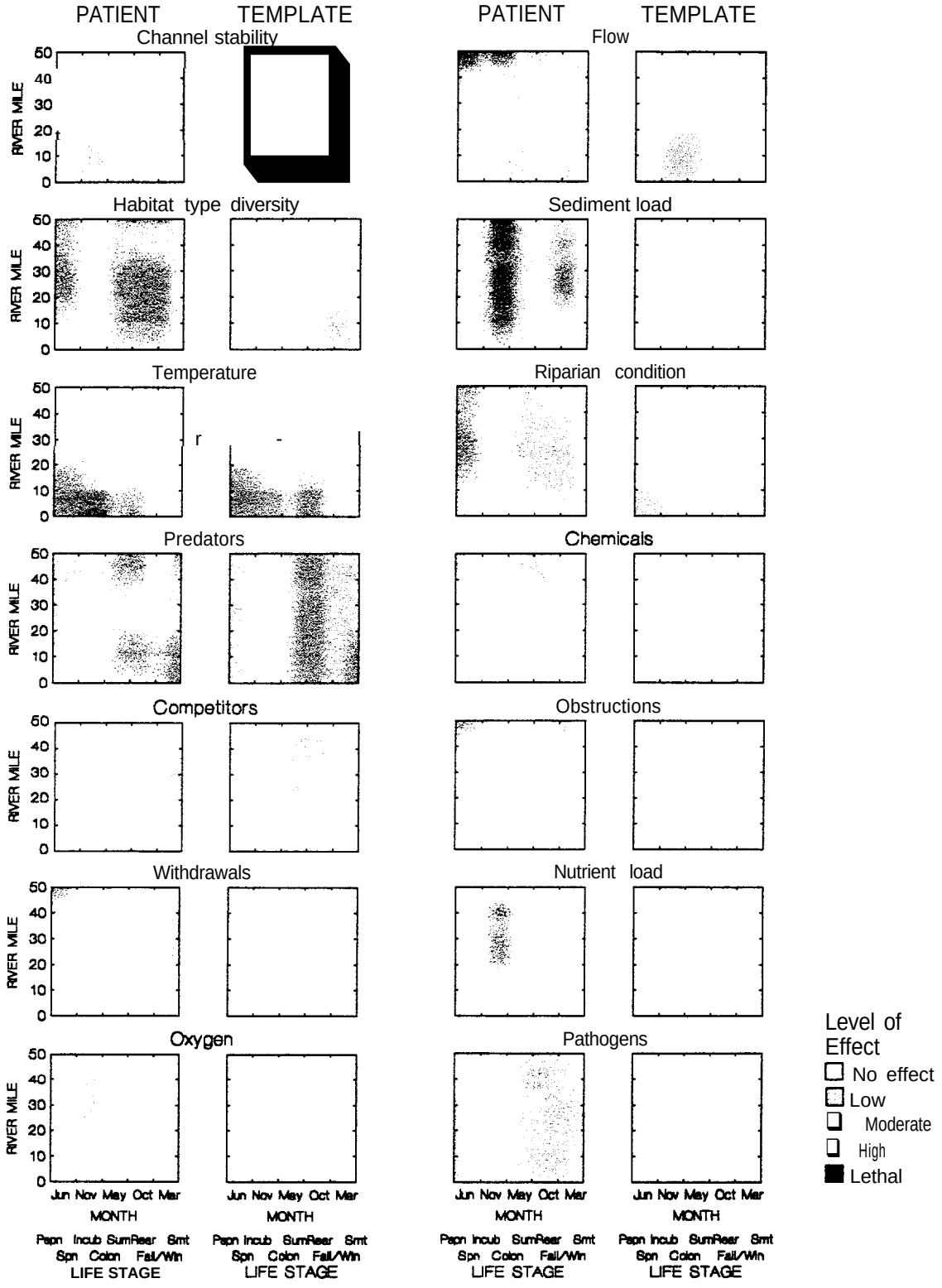
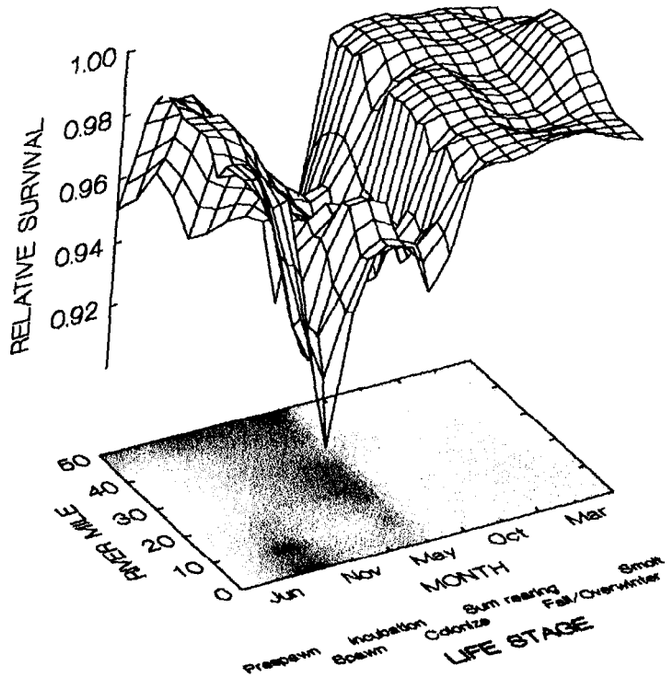


Wallowa R Environmental Attributes



Wallowa R Relative Survival

Pa tlent



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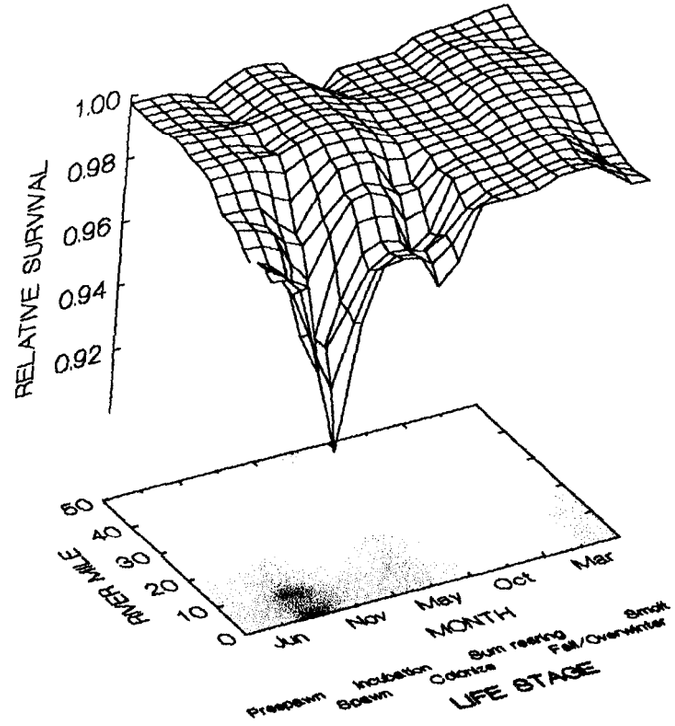
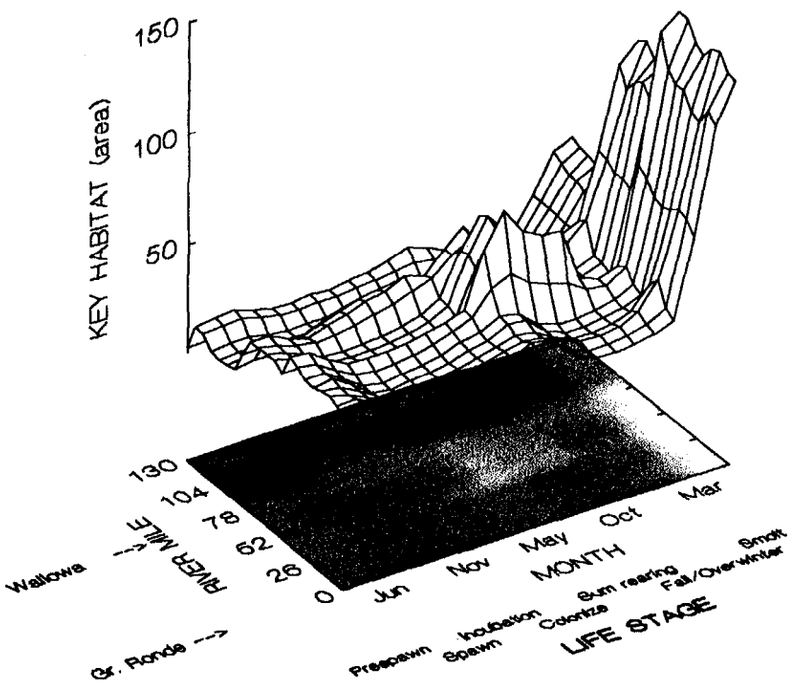


Wallowa R/Grande Ronde R Key Habitat Quantity

Patient



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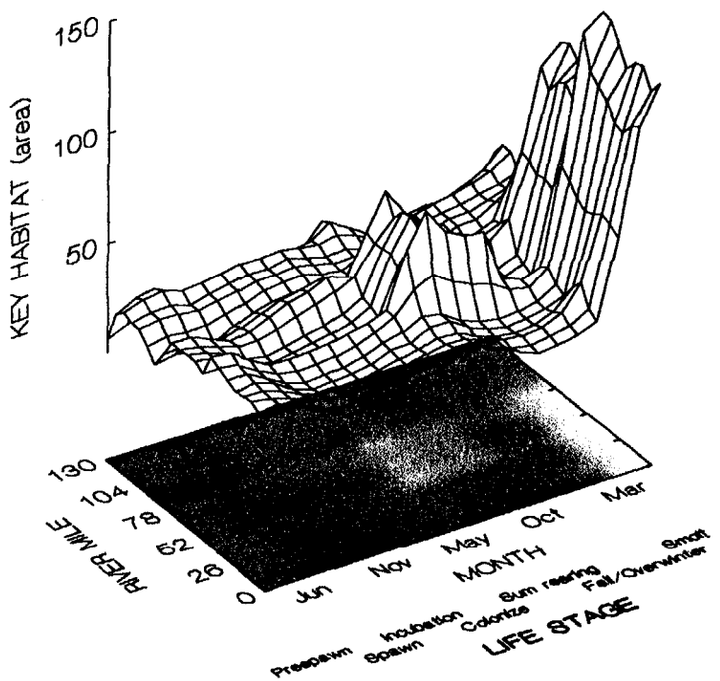
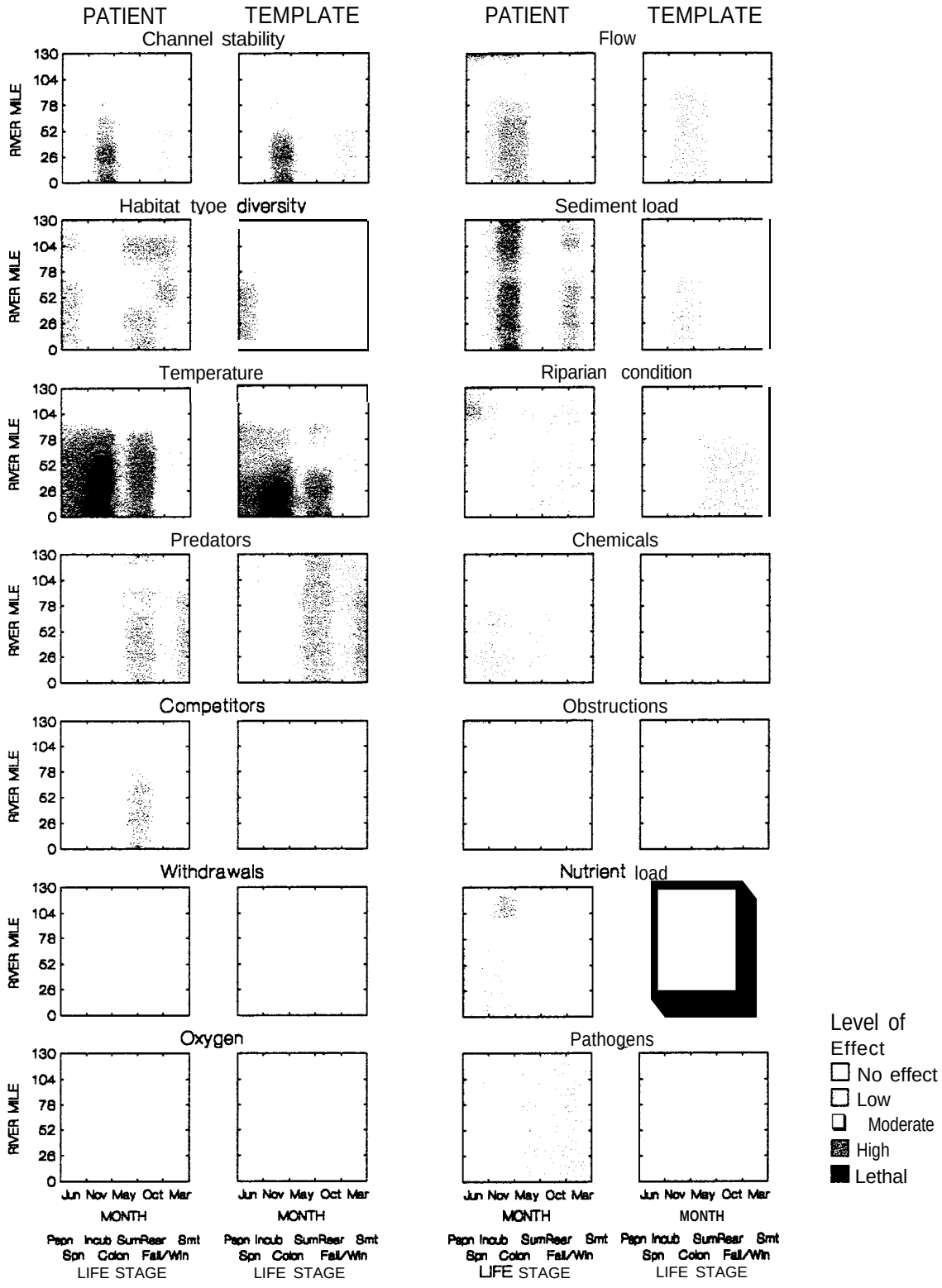
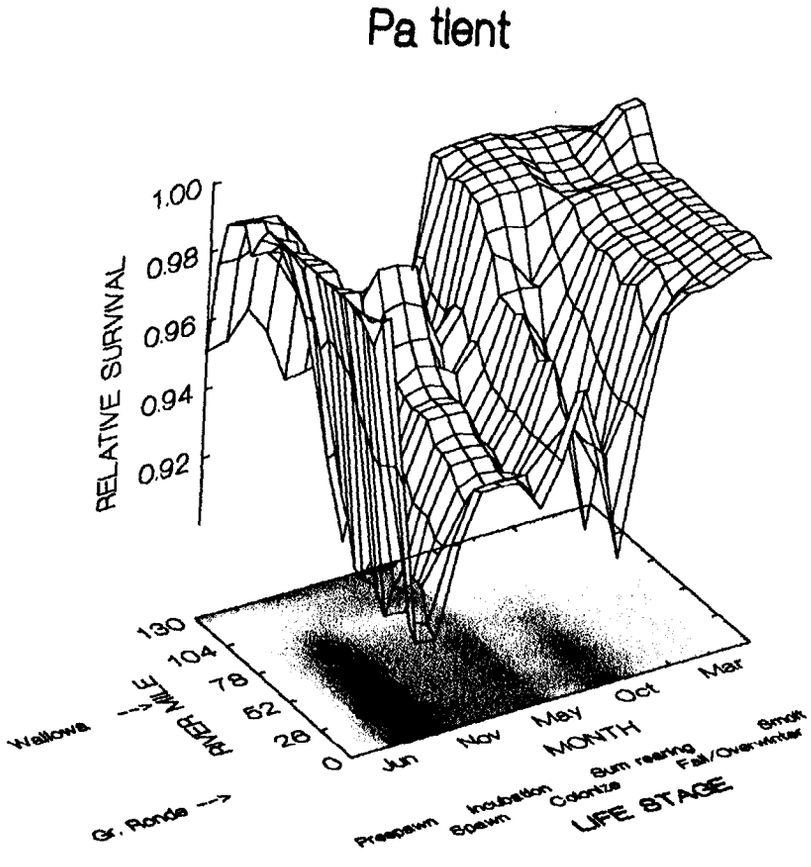
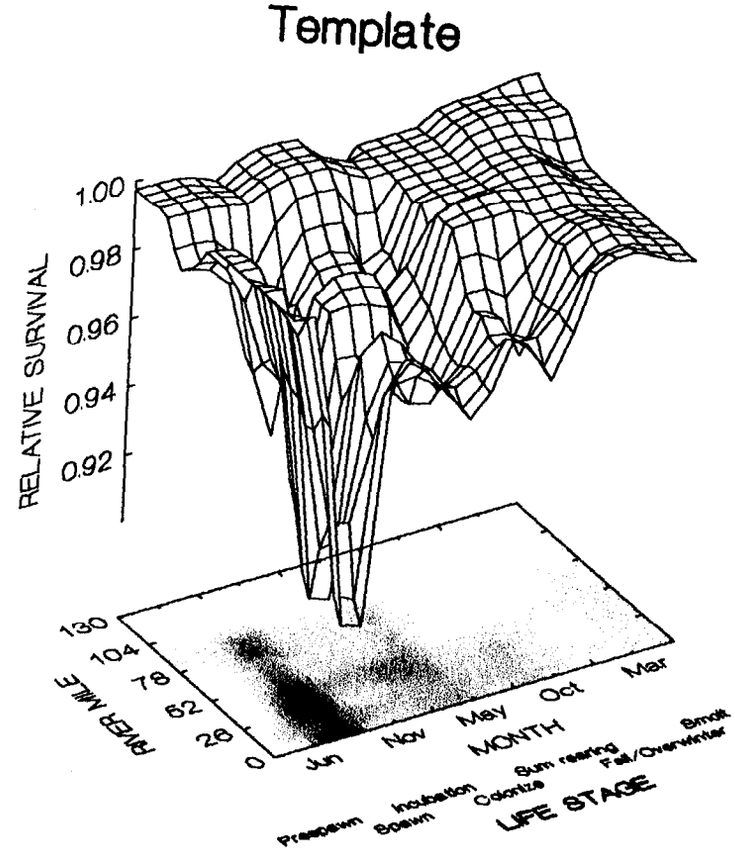


Wallowa R/Grande Ronde R Environmental Attributes



Wallowa R/Grande Ronde R Relative Survival





Stream Reach Range

Minam R / Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Minam R./Wallowa R./Grande Ronde R.

Key Habitat Quantity

The extent of changes from historic levels in the quantity of key habitat for spring chinook in the Minam River differ by life stage and stream reach. The greatest reductions in key habitat have occurred in approximately the lower third of the mainstem for prespawning, spawning, and incubation life stages. Lesser, though still substantial, reductions have occurred through much of the mid portion of the mainstem for some life stages, namely fry colonization and summer rearing.

The quantities of key habitat in the Wallowa and Grande Ronde rivers downstream of the Minam River are nearly unchanged compared to historic levels.

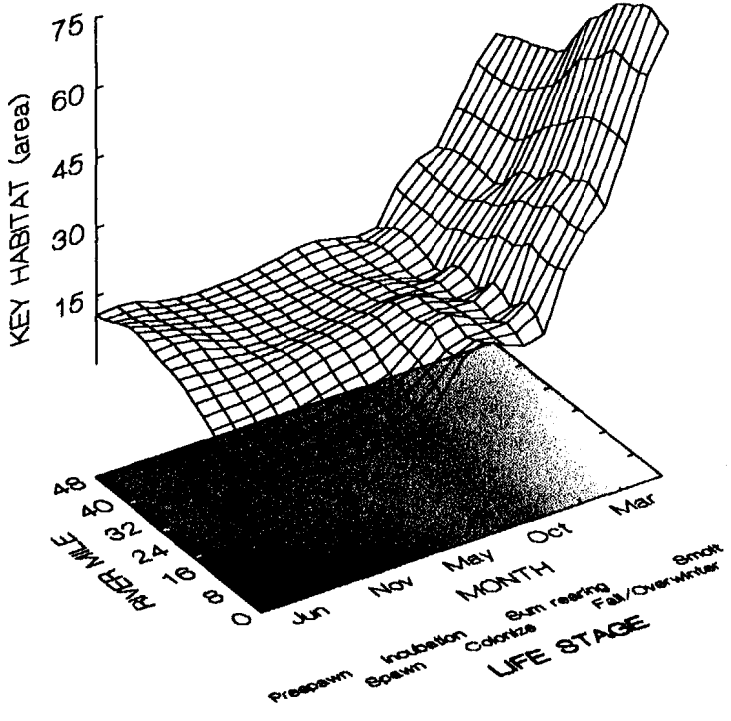
Relative Productivity (Survival)

The capability of the mainstem Minam River of supporting spring chinook productivity (survival) is largely unchanged compared to historic conditions for all life stages. Some survival conditions in the lower ten miles of river have worsened slightly, however, due mainly to small changes in temperature regimes, habitat diversity, sediment load, channel stability, and flow regimes.

Survival conditions within the Wallowa and Grande Ronde rivers downstream of the Minam River have worsened compared to those that existed historically, although these reaches have always been moderately to largely unfavorable for survival during some life stages. In particular, conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages in the lower Grande Ronde River. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Minam R Key Habitat Quantity

Patient



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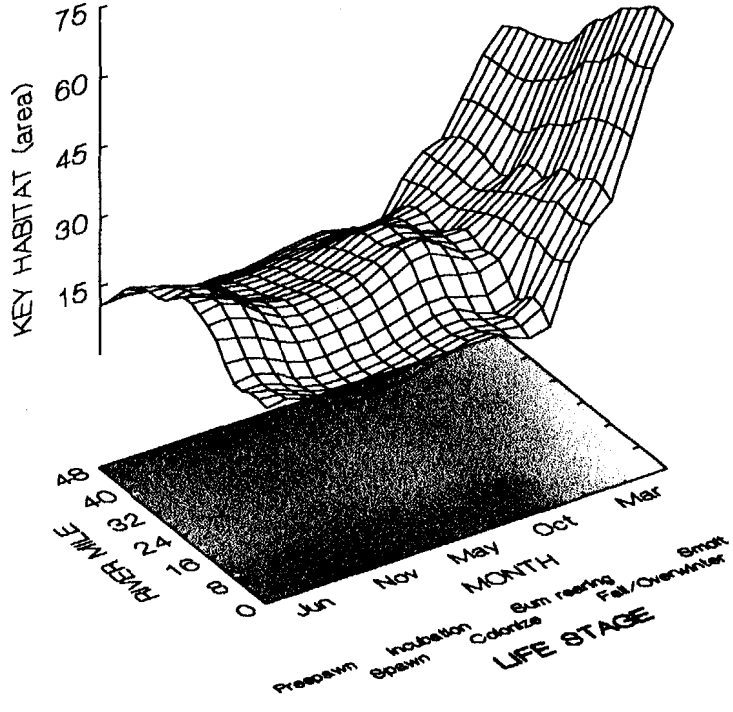
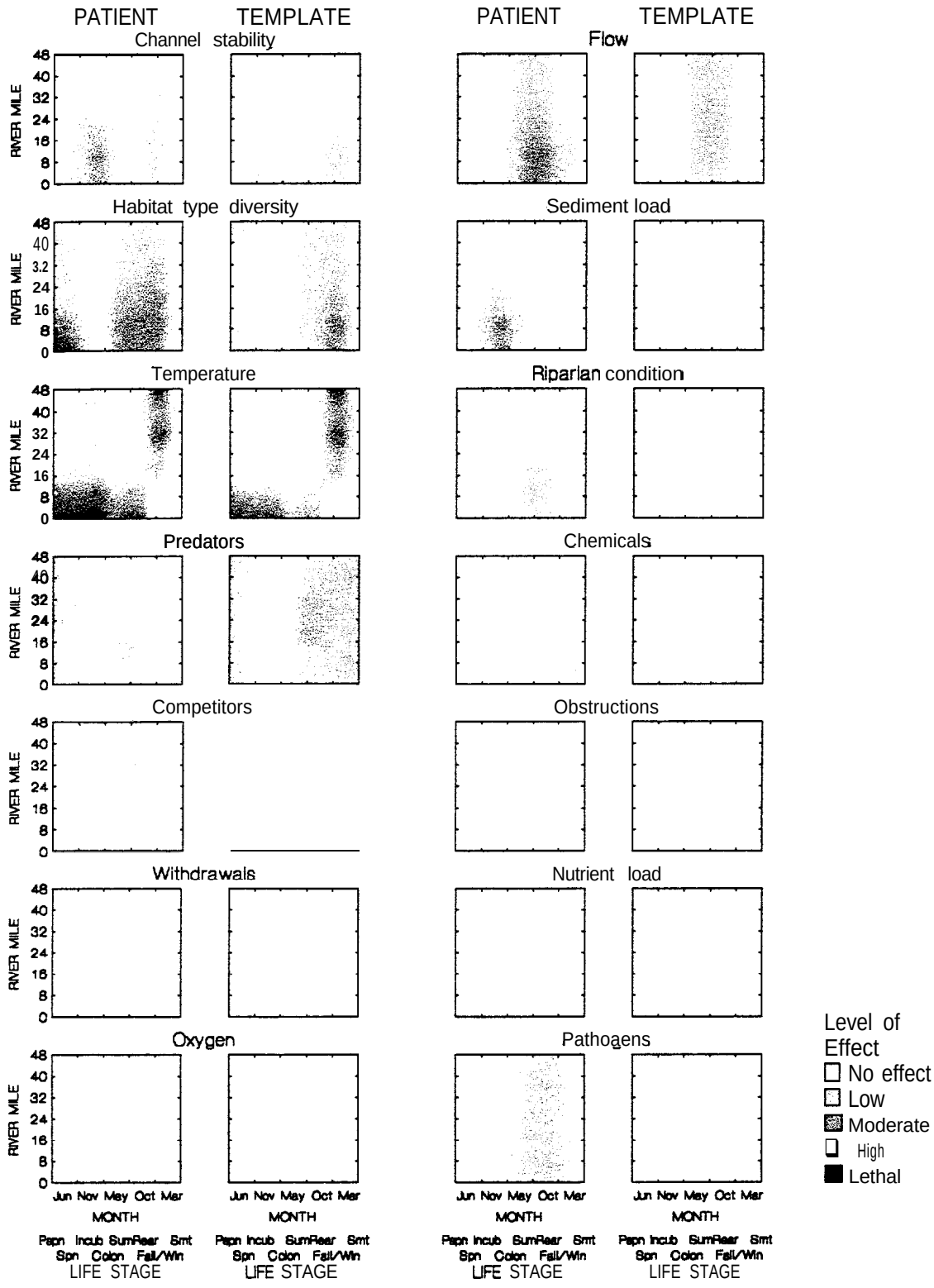
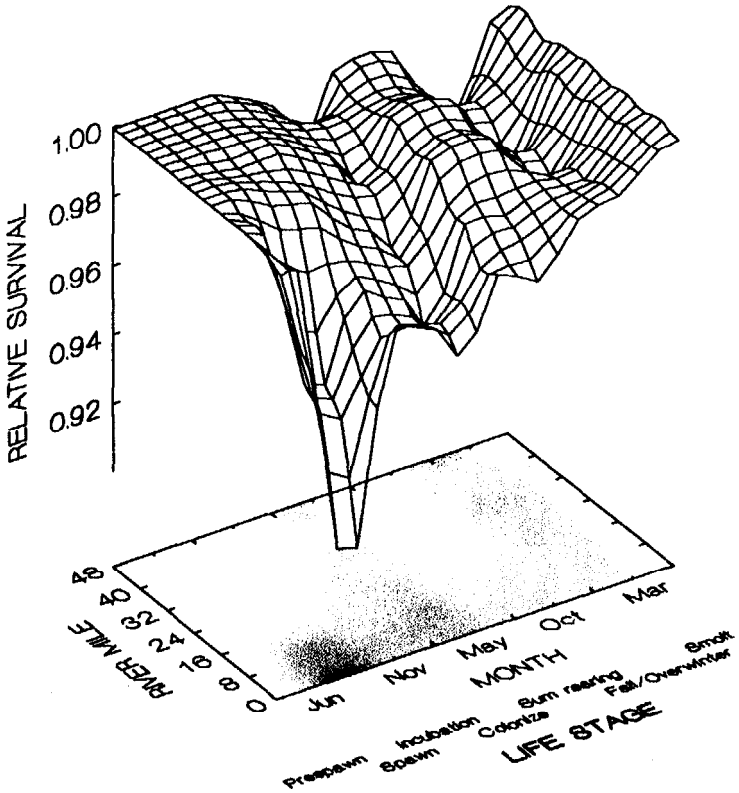


Minam R Environmental Attributes



Minam R Relative Survival

Patient



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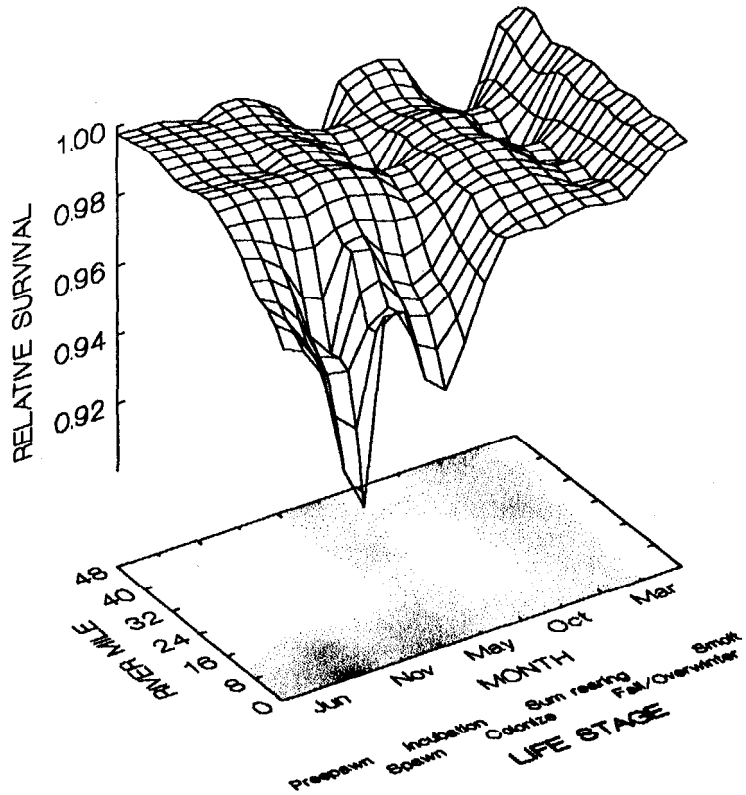
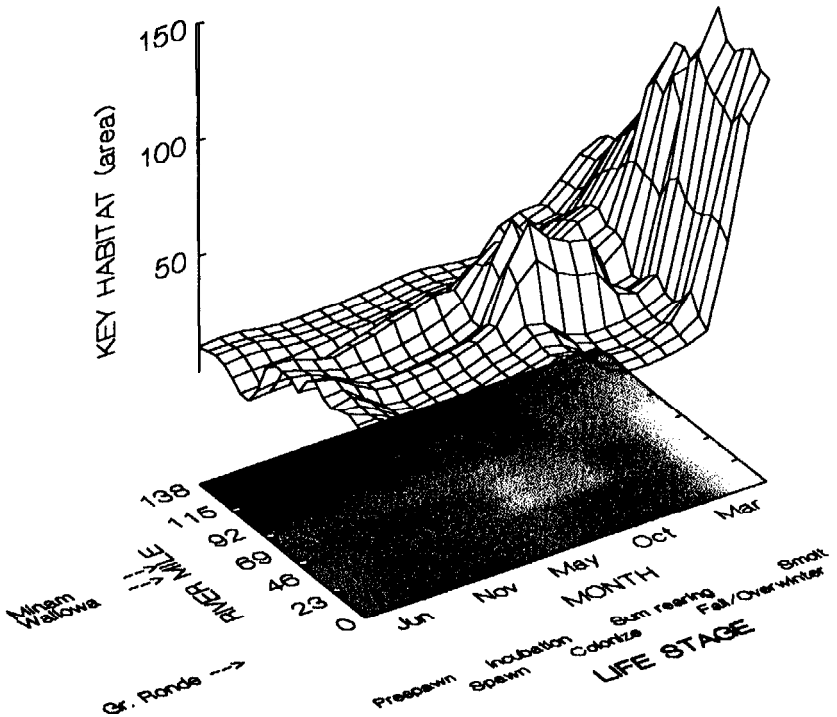


Minam R/Wallowa R/Grande Ronde R Key Habitat Quantity

Patient



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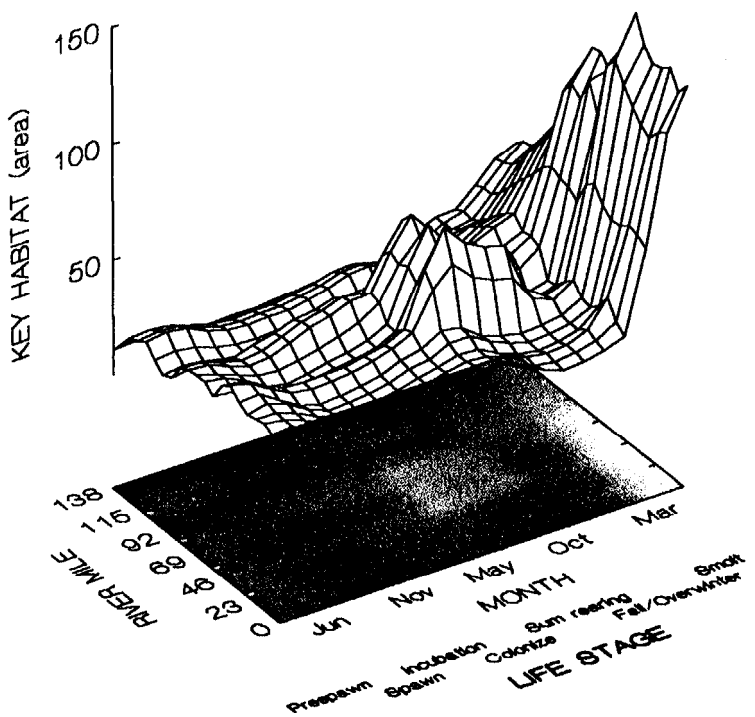
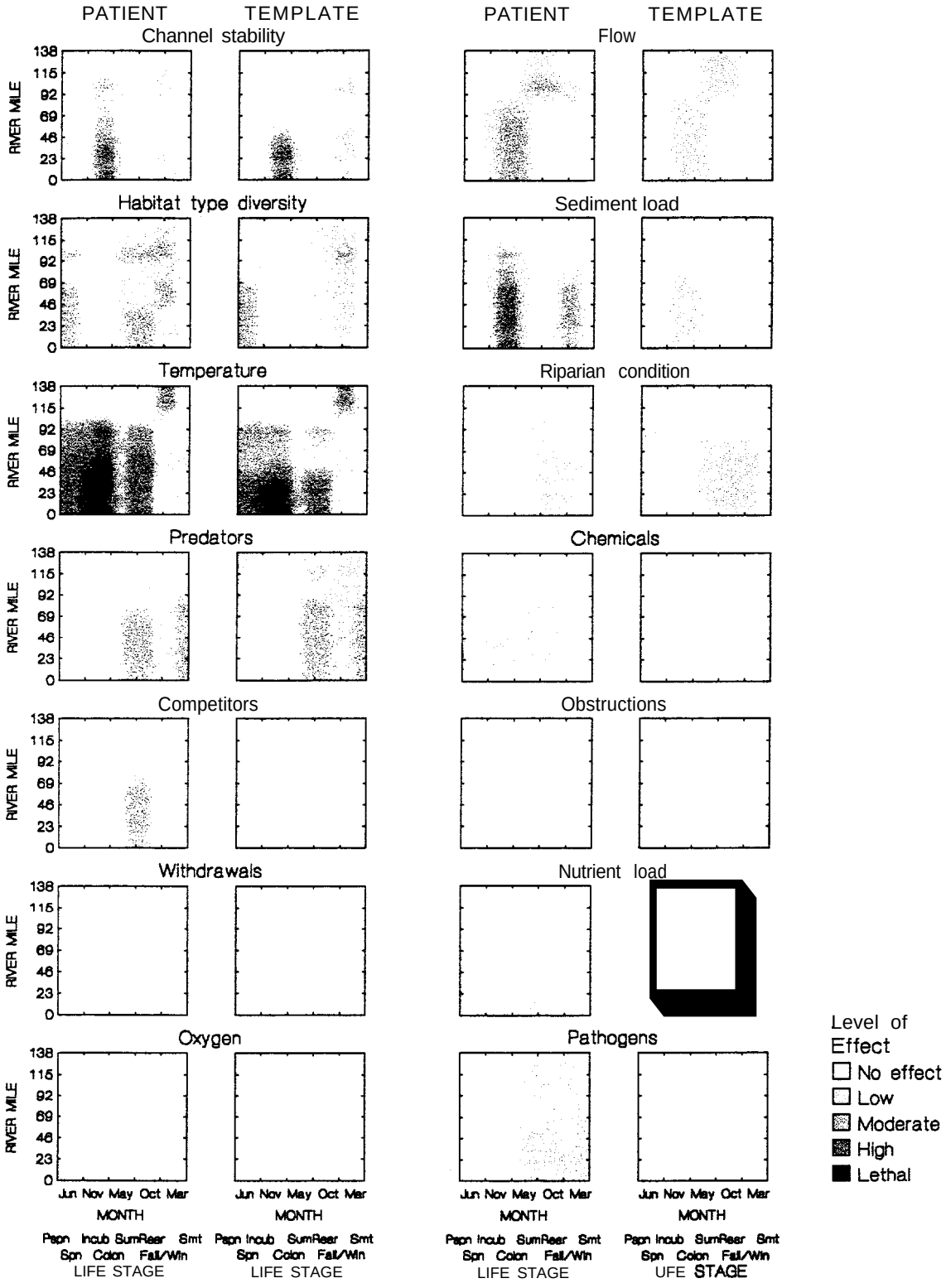
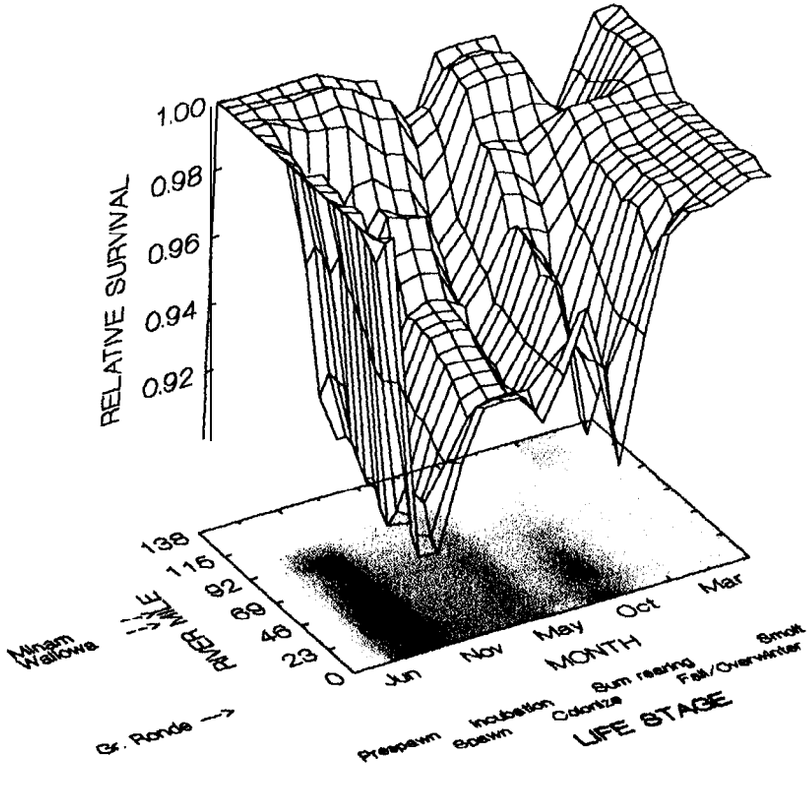


Minam R/Wallowa R/Grande Ronde R
Environmental Attributes



Minam R/Wallowa R/Grande Ronde R Relative Survival

Patient



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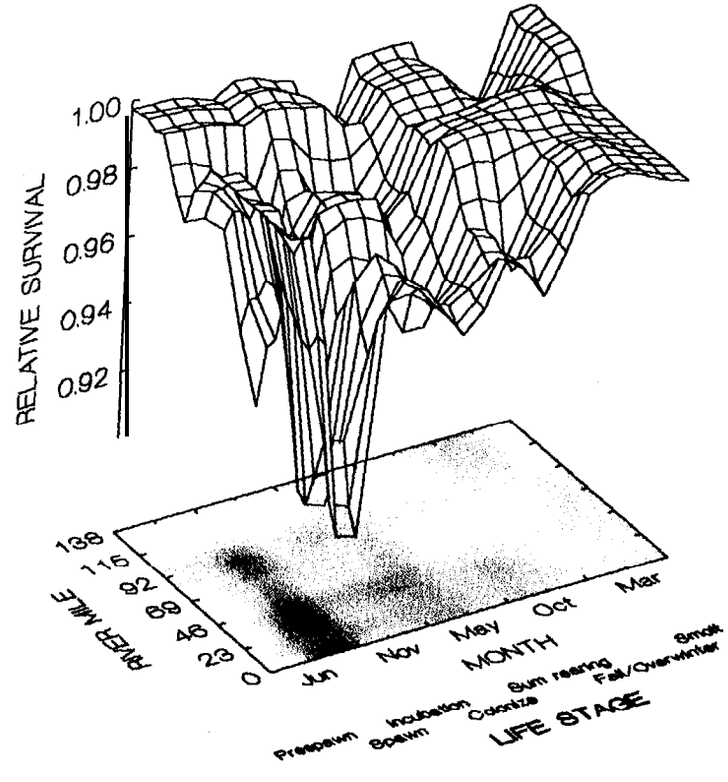


Stream Reach Range

Bear Cr / Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Bear Cr./Wallowa R./Grande Ronde R.

Key Habitat Quantity

The extent of changes from historic levels in the quantity of key habitat for spring chinook in Bear Creek differ by life stage and stream reach. Historically, the largest quantities of key habitat occurred in the lower six miles of stream (excluding smolt stage). Very substantial reductions have occurred in this section for all life stages except smolt. Lesser reductions have also occurred through the mid portions of the stream for some life stages. Quantity of key habitat in the upper reach is nearly unchanged.

The quantities of key habitat in some portions of the Wallowa River downstream of Bear Creek River are substantially less than historic levels, except in the lower ten miles (below Minam River) where they are relatively unchanged.

The quantity of key habitat in the Grande Ronde River downstream of the Wallowa River is nearly unchanged compared to historic levels.

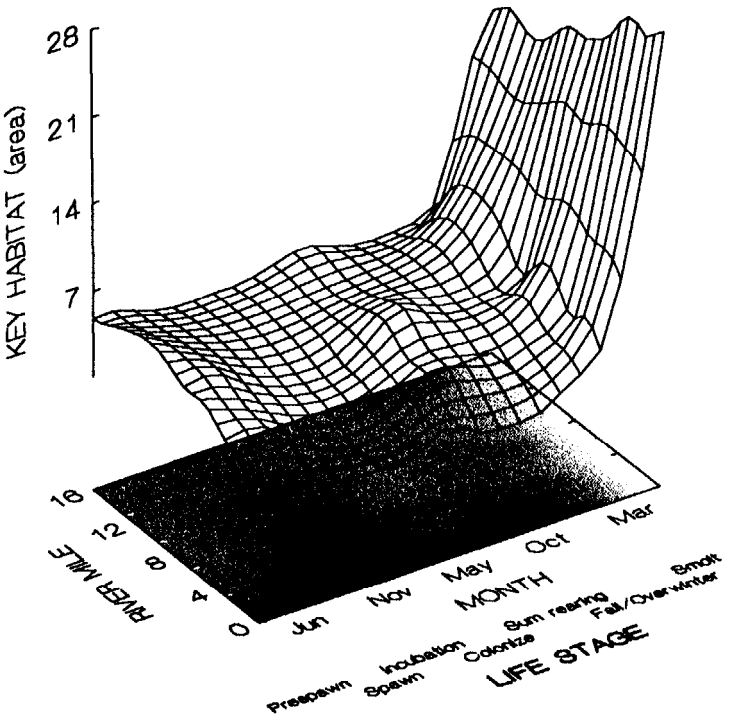
Relative Productivity (Survival)

The capability of the lower six miles of Bear Creek of supporting spring chinook productivity (survival) is greatly reduced compared to historic conditions for most life stages. Survival conditions in this section are poorer due primarily to alterations in flow patterns, although other attributes (e.g., habitat diversity and temperature regimes) have also been affected. Historically, survival conditions were excellent for much of Bear Creek, and especially in the lower reaches of the stream. Changes in upper portions of the stream are comparatively minor.

Survival conditions in the Wallowa River downstream of the Bear Creek have worsened compared to those that existed historically, although the lower portions of the river have always been moderately unfavorable for survival during some life stages. Conditions have also worsened in the Grande Ronde River downstream of the Wallowa River. However, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages in the lower Grande Ronde River. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Bear Cr Key Habitat Quantity

Patient



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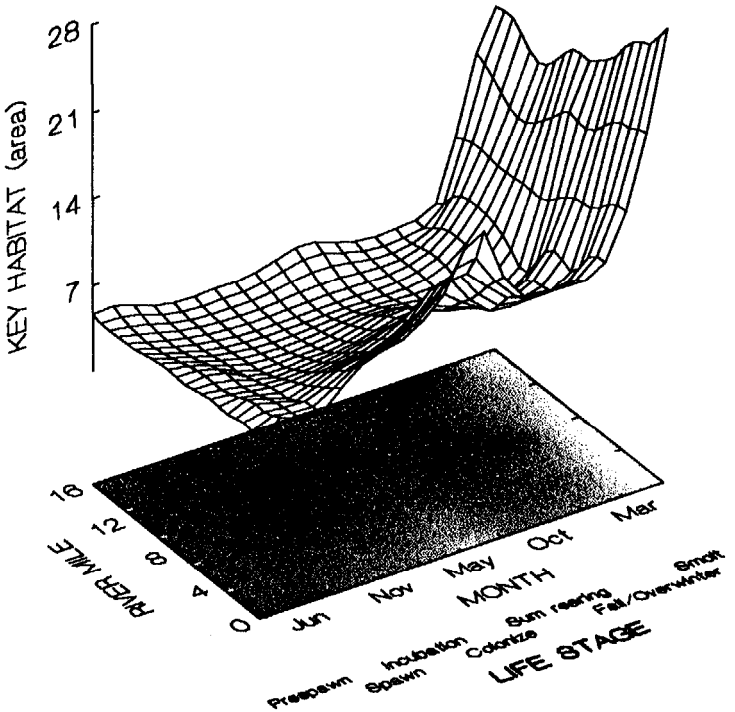
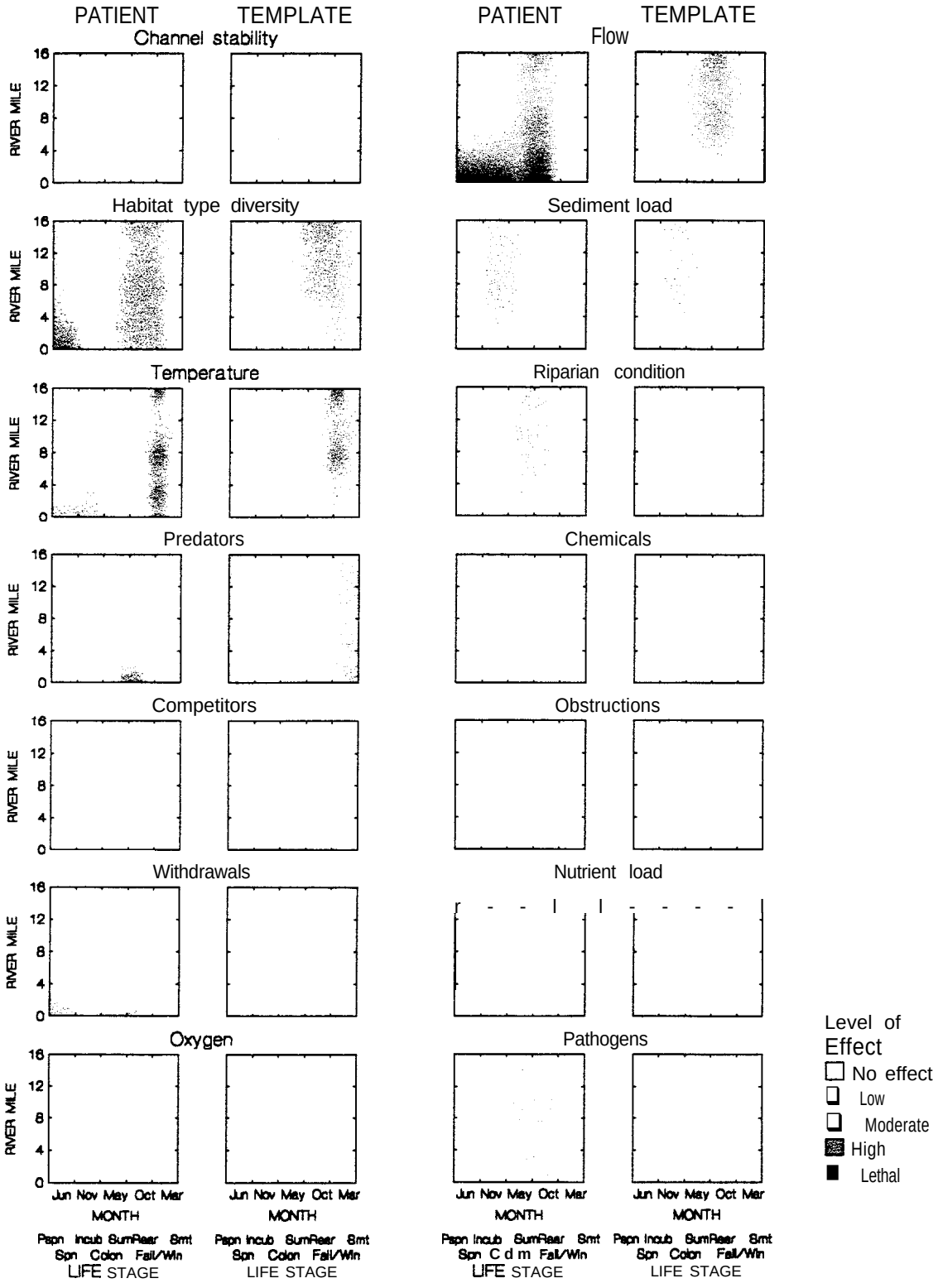
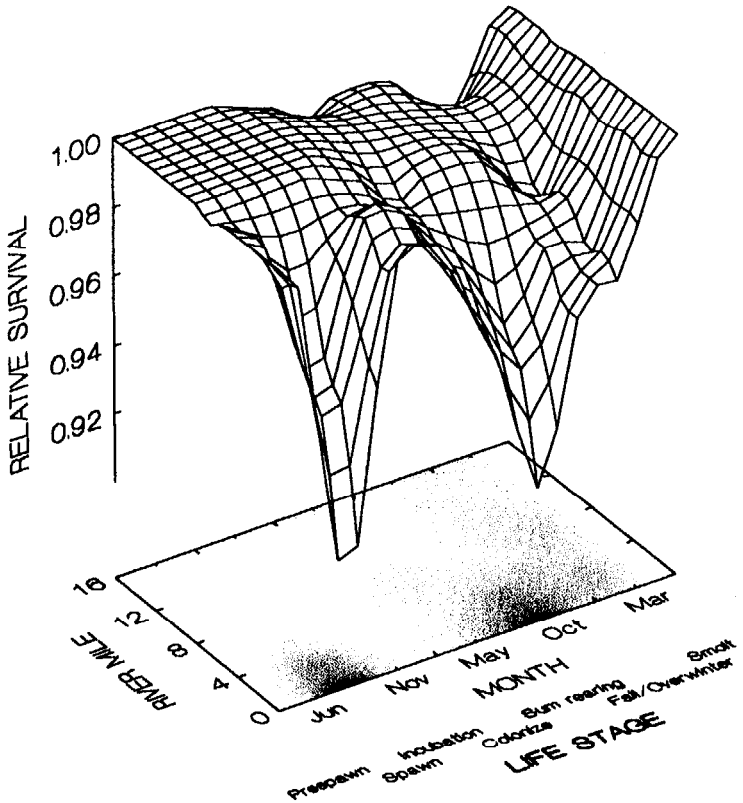


Bear Cr Environmental Attributes



Bear Cr Relative Survival

Patient



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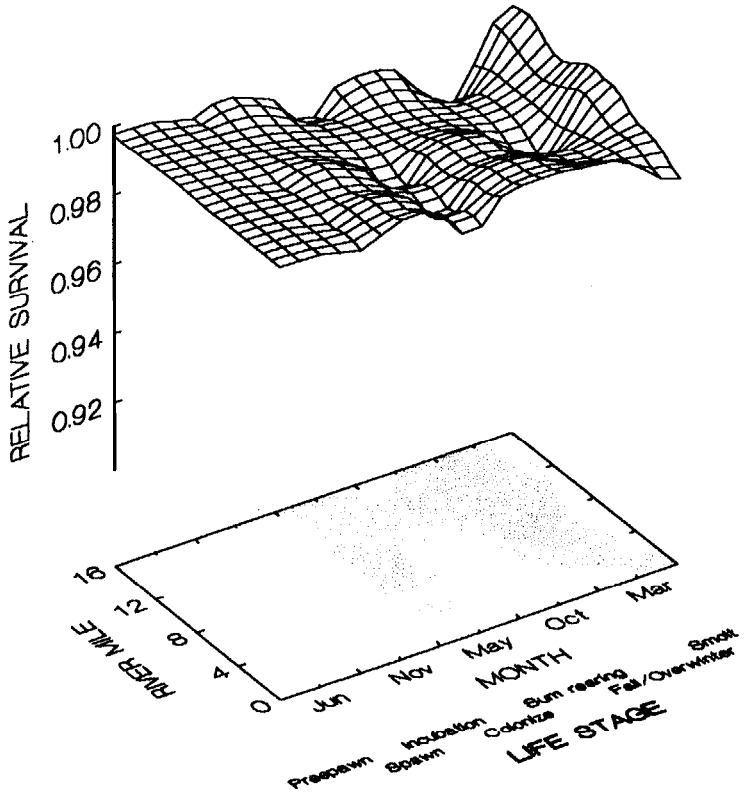
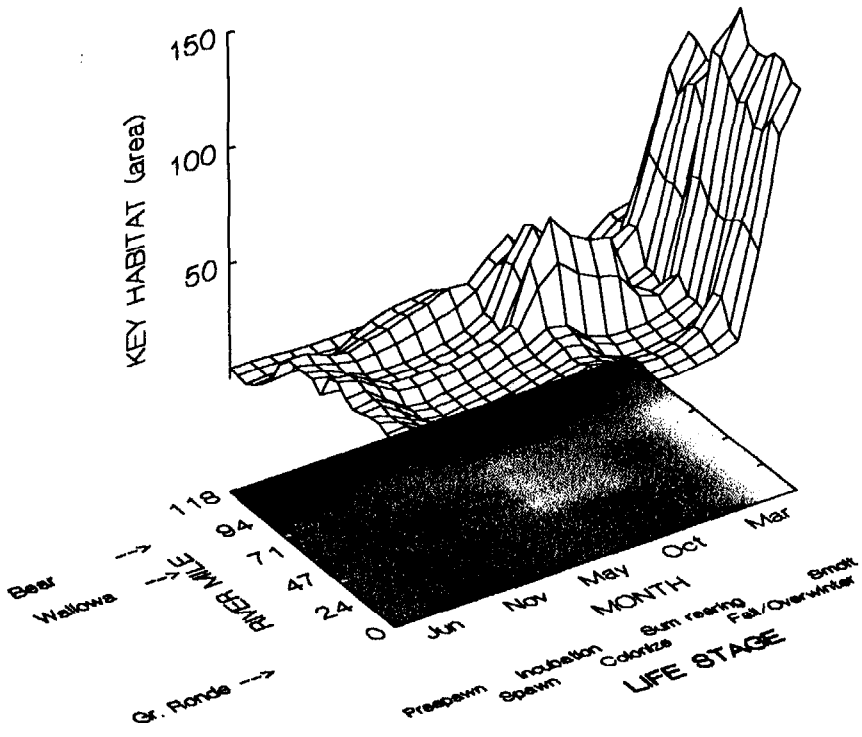


Bear Cr/Wallowa R/Grande Ronde R Key Habitat Quantity

Patient



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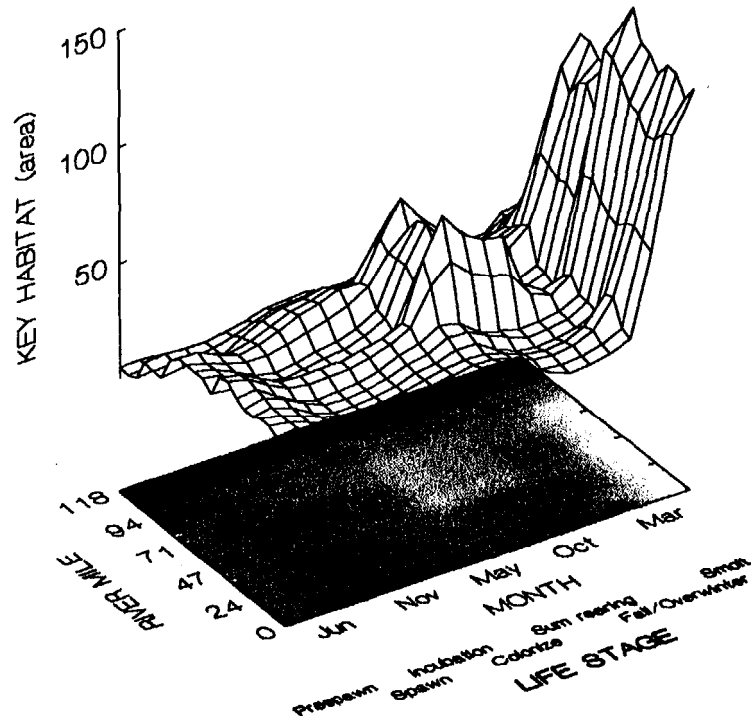
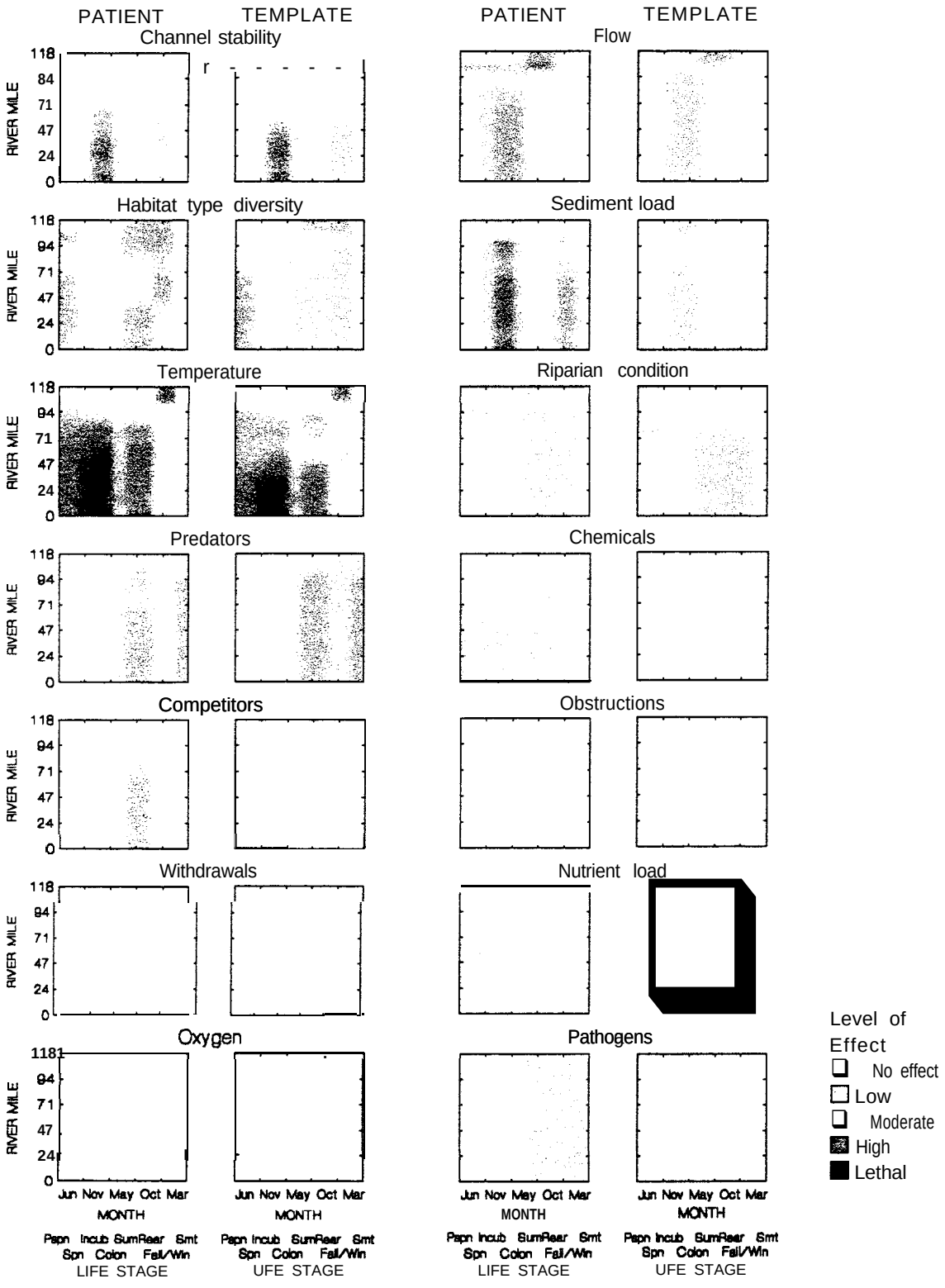
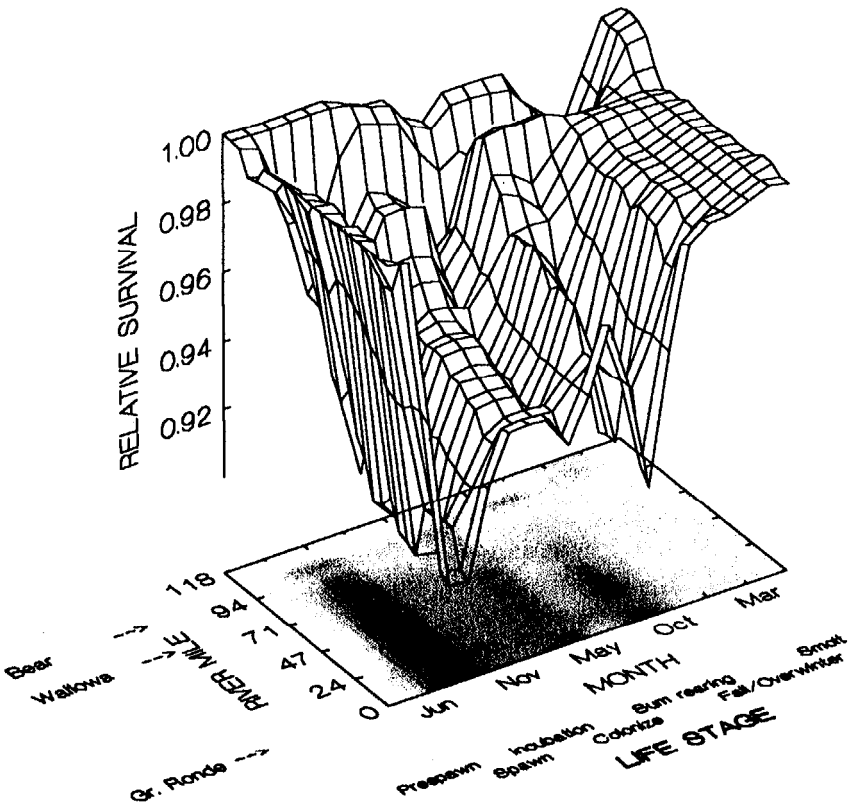


Bear Cr/Wallowa R/Grande Ronde R
Environmental Attributes



Bear Cr/Wallowa R/Grande Ronde R Relative Survival

Patient



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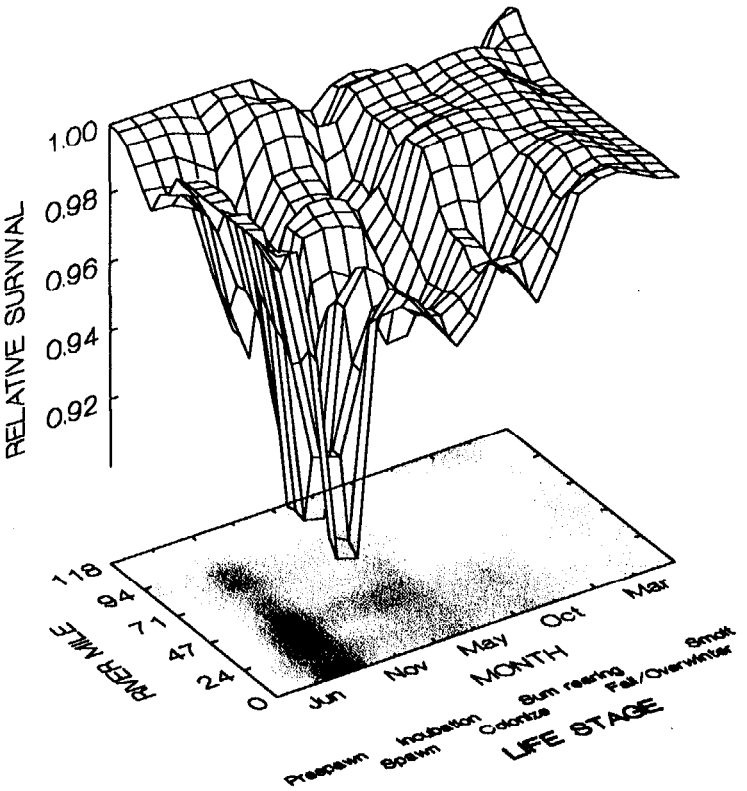


Stream Reach Range

Lostine R / Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Lostine R./Wallowa R./Grande Ronde R.

Key Habitat Quantity

The extent of changes from historic levels in the quantity of key habitat for spring chinook in the Lostine River differ by life stage and stream reach. Historically, the largest quantities of key habitat occurred in the lower 15 miles of river, downstream of a canyon. Substantial reductions have occurred in some parts of this section, notably for the prespawning, spawning, incubation, fry colonization, and summer rearing stages. Quantity of key habitat is virtually unchanged in the upper 10 miles of stream; this section contains much less habitat compared to quantities located downstream, however.

The quantities of key habitat in some portions of the Wallowa River downstream of the Lostine River have been reduced. Quantities in the Grande Ronde River downstream of the Wallowa River are nearly unchanged compared to historic levels.

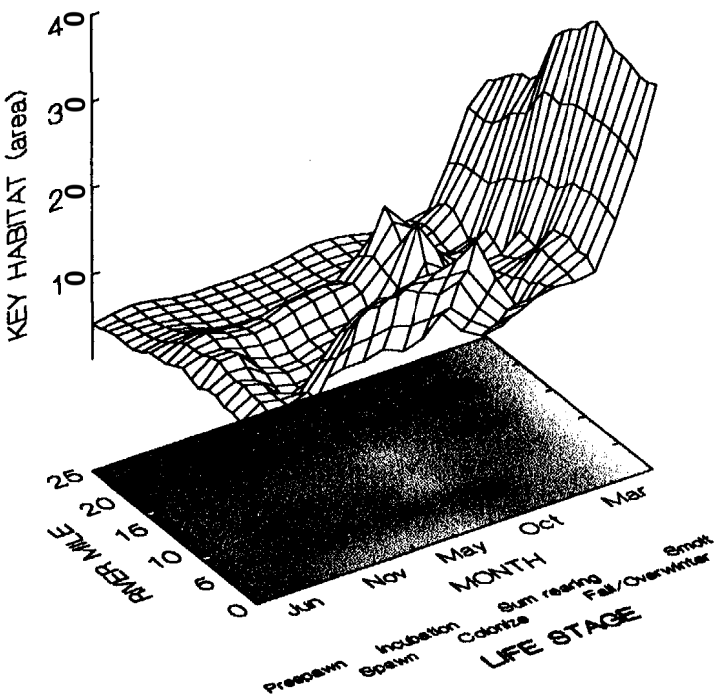
Relative Productivity (Survival)

The capability of the lower 15 miles of mainstem Lostine River of supporting spring chinook productivity (survival) is substantially reduced compared to historic conditions for most life stages. Survival conditions in this section are poorer due primarily to higher summer temperatures, alterations in flow regimes, and loss of habitat diversity; other attributes have changed also. Historically, survival conditions were excellent in the lower ten miles; historic conditions worsened in an upstream direction with increasing stream gradient and elevation. Changes in the upper ten miles are comparatively minor.

Survival conditions in the Wallowa River downstream of the Lostine River have worsened compared to those that existed historically, although some reaches have always been moderately unfavorable for survival during some life stages. Conditions have also worsened in the Grande Ronde River downstream of the Wallowa River. However, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages in the lower Grande Ronde River. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Lostine R Key Habitat Quantity

Patient



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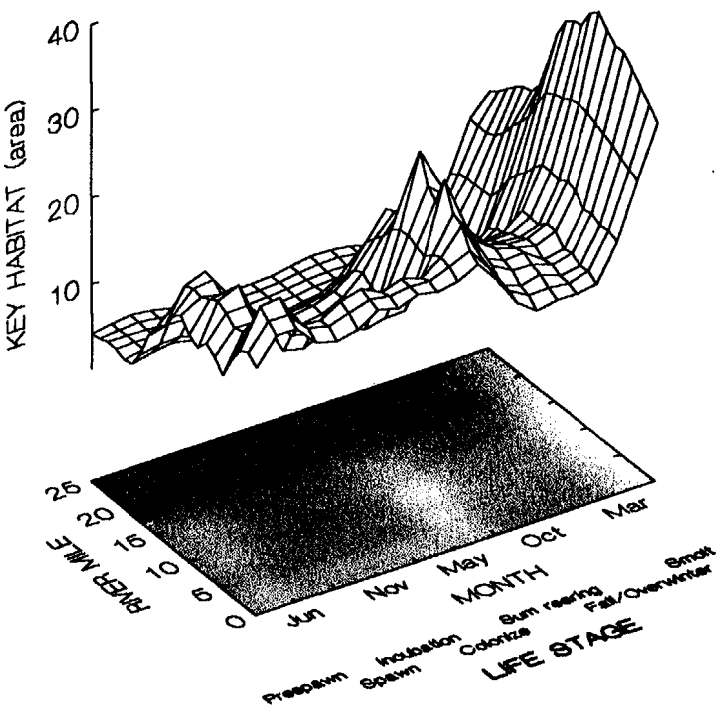
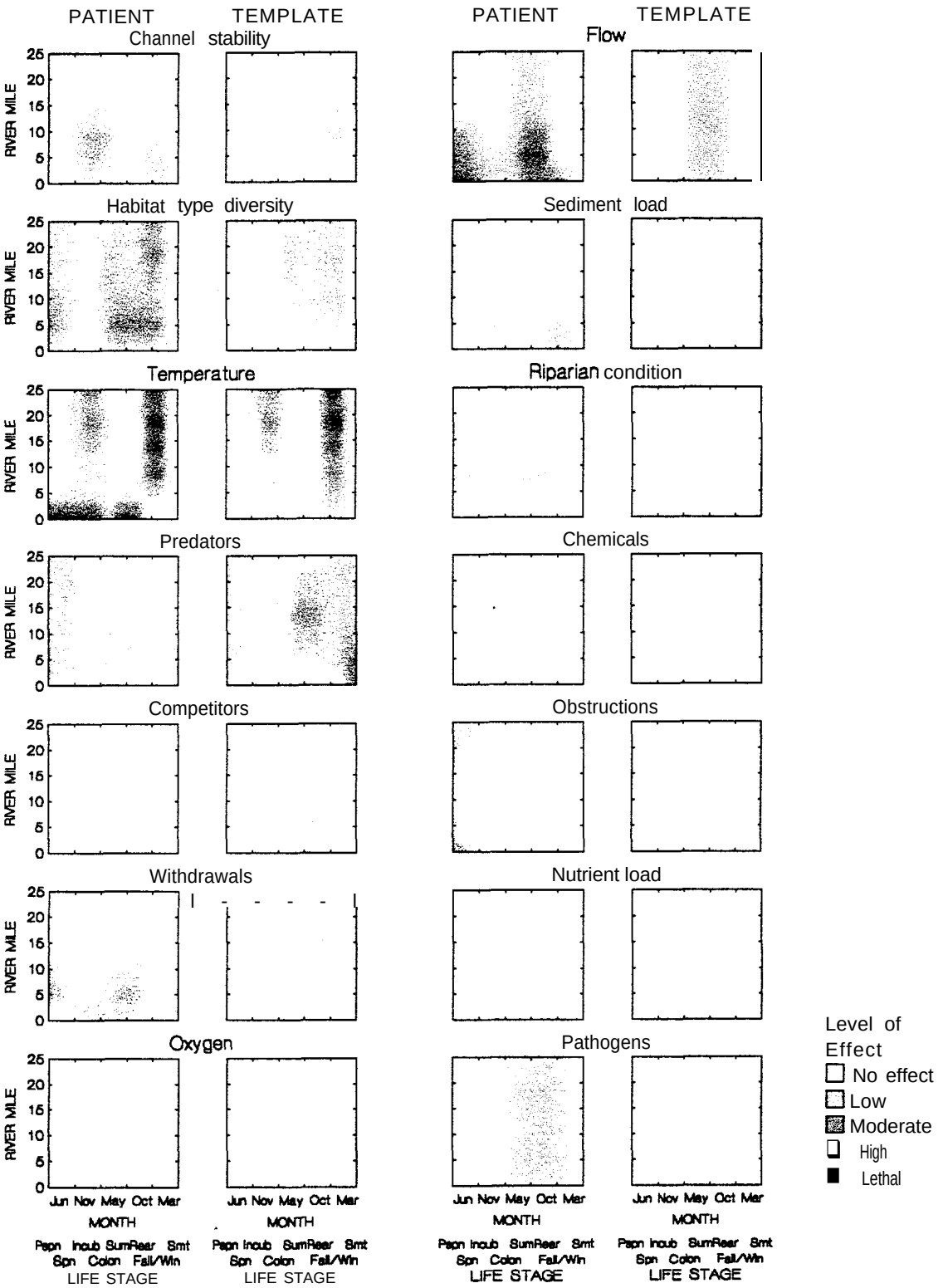
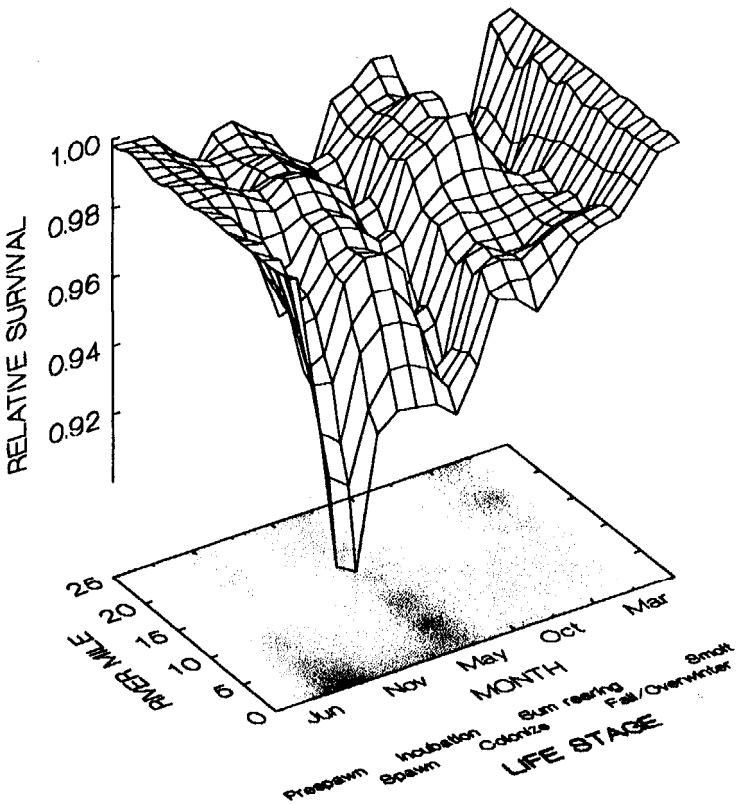


Lostine R Environmental Attributes



Lostine R Relative Survival

Patient



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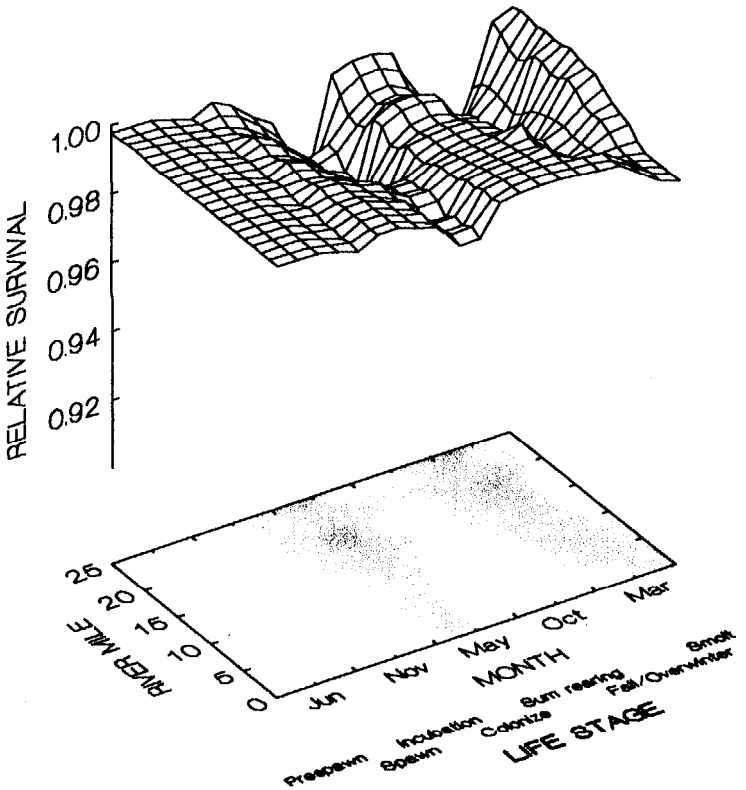
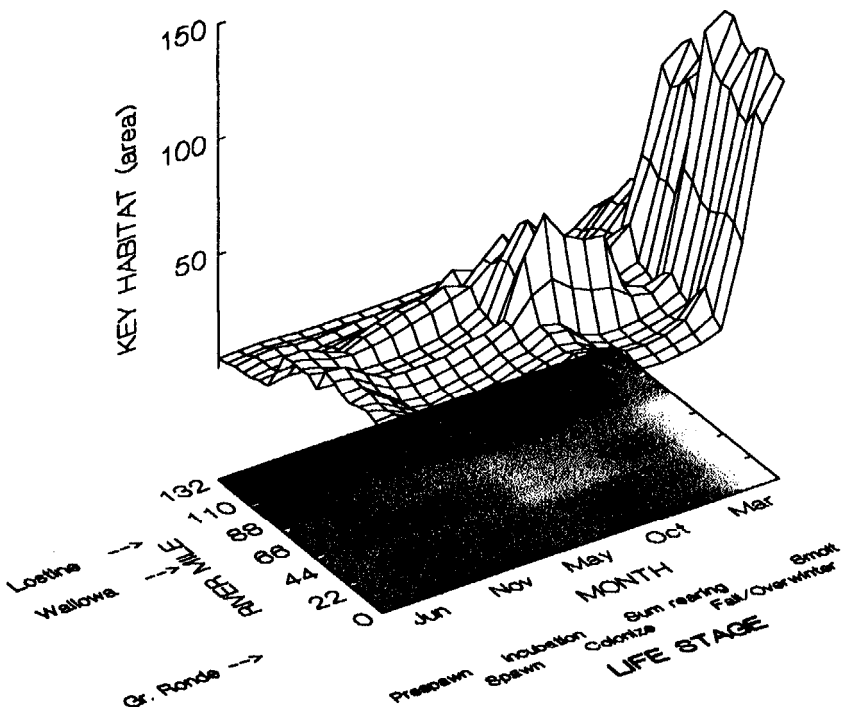


Lostine R/Wallowa R/Grande Ronde R Key Habitat Quantity

Patient



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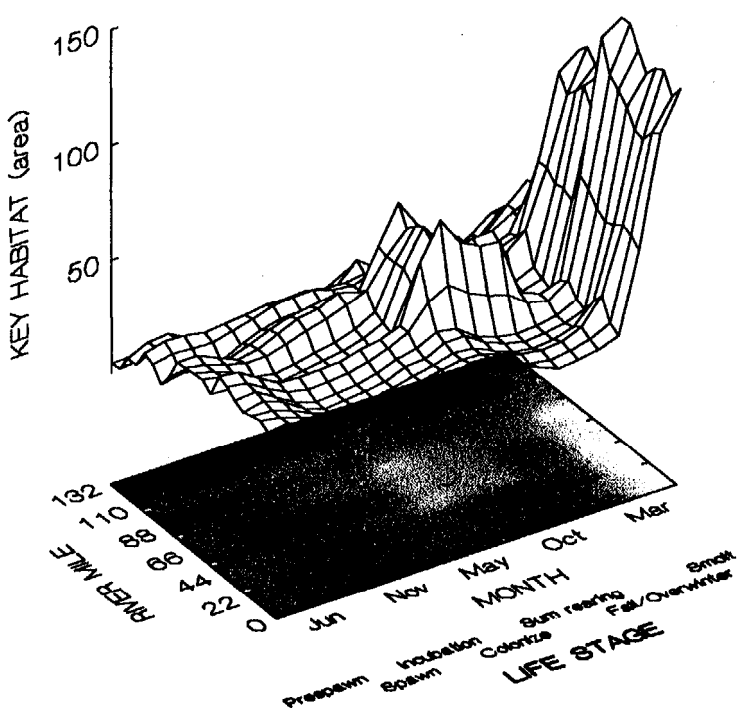
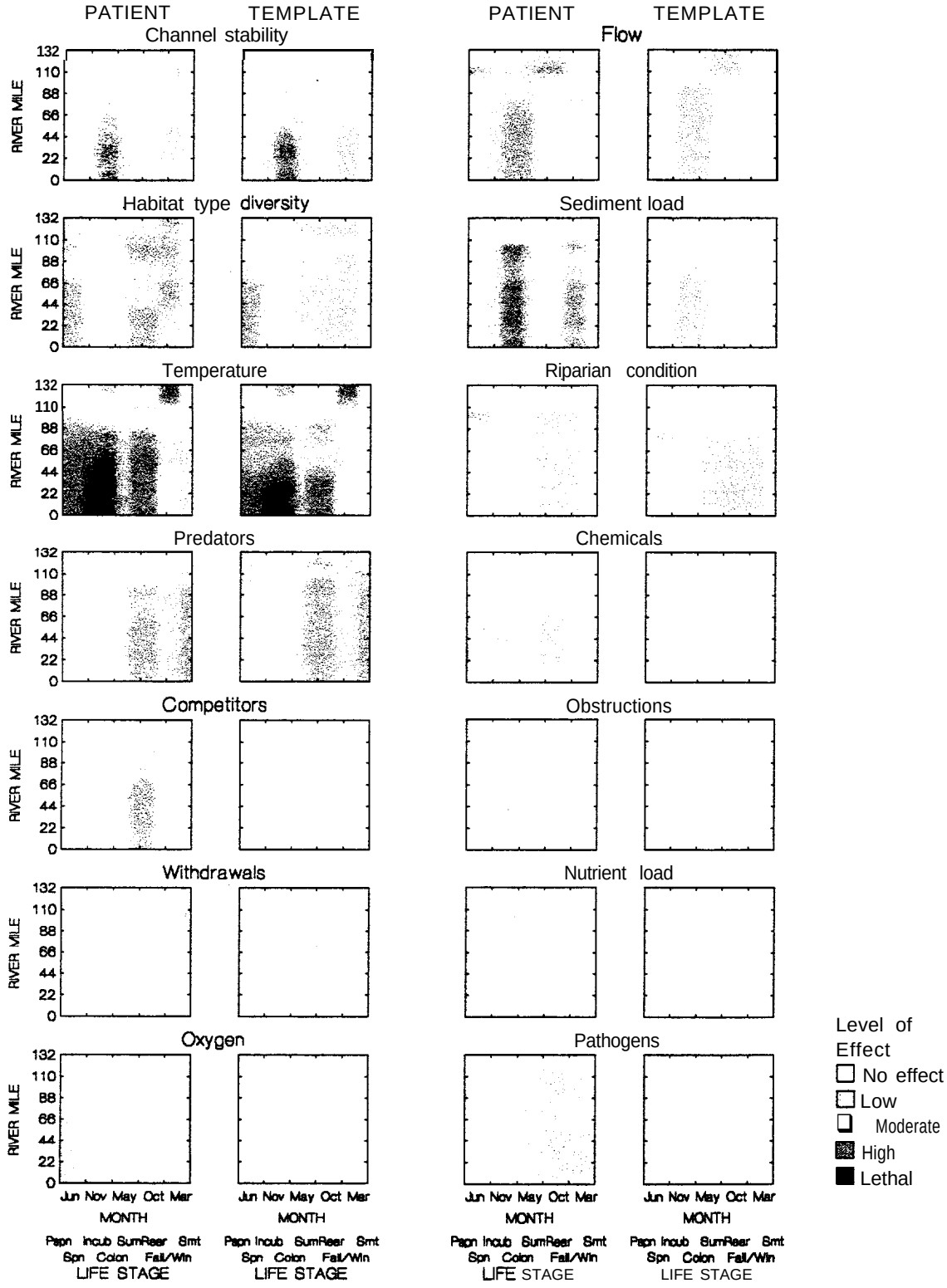
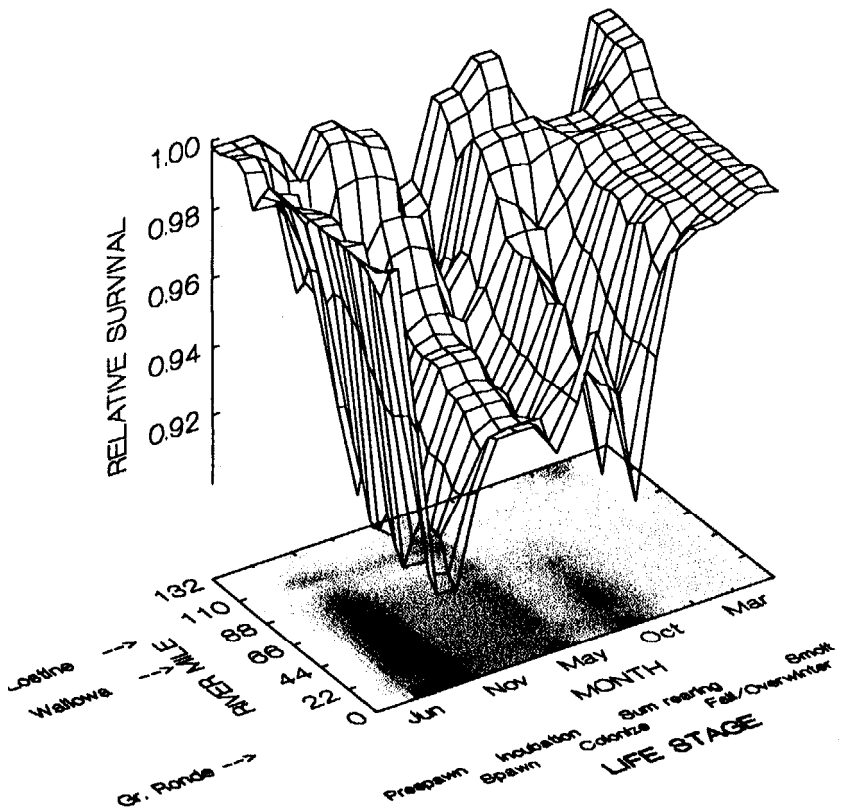


Lostine R/Wallowa R/Grande Ronde R
Environmental Attributes



Lostine R/Wallowa R/Grande Ronde R Relative Survival

Patient



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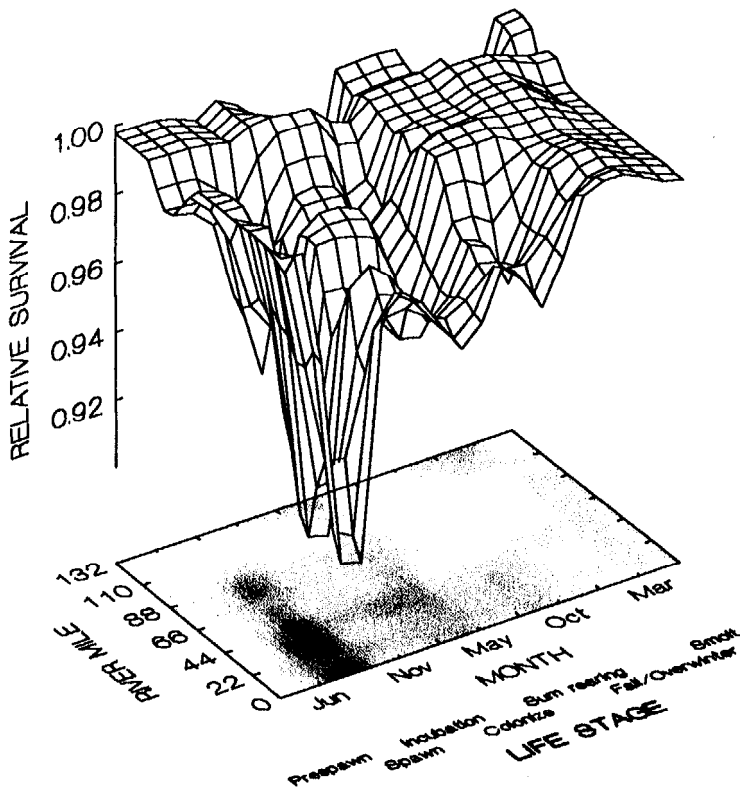


Stream Reach Range

Hurricane Cr / Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Hurricane Cr./Wallowa R./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for most life stages of spring chinook throughout most of Hurricane Creek (lower six miles only covered here) has been very substantially reduced compared to historic levels. The fry colonization, summer rearing, and overwintering life stages have been particularly affected.

The quantities of key habitat in most reaches of the Wallowa River downstream of Hurricane Creek River are substantially less than historic levels, except in the lower ten miles (below Minam River) where they are relatively unchanged.

The quantity of key habitat in the Grande Ronde River downstream of the Wallowa River is nearly unchanged compared to historic levels.

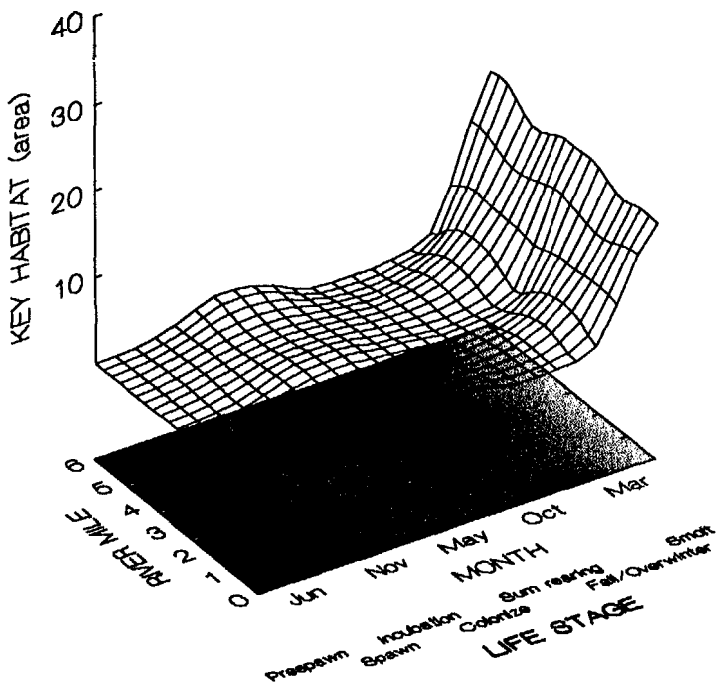
Relative Productivity (Survival)

The capability of Hurricane Creek of supporting spring chinook productivity (survival) is greatly reduced compared to historic conditions for every life stage except smolt. Survival conditions are worst in the upper half of the stream (upstream of Lower Alderslope Ditch). Current survival potential in this reach in mid to late summer is essentially zero due to dewatering of the channel. Survival conditions in Hurricane Creek are poor due to alterations in flow regimes, habitat diversity, sediment load, channel stability, and temperature regimes. Historically, survival conditions were excellent for the lower half of the stream, with conditions worsening with increasing gradient.

Survival conditions in the Wallowa River downstream of the Hurricane Creek have worsened compared to those that existed historically, although the lower portions of the river have always been moderately unfavorable for survival during some life stages. Conditions have also worsened in the Grande Ronde River downstream of the Wallowa River. However, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages in the lower Grande Ronde River. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Hurricane Cr Key Habitat Quantity

Patient



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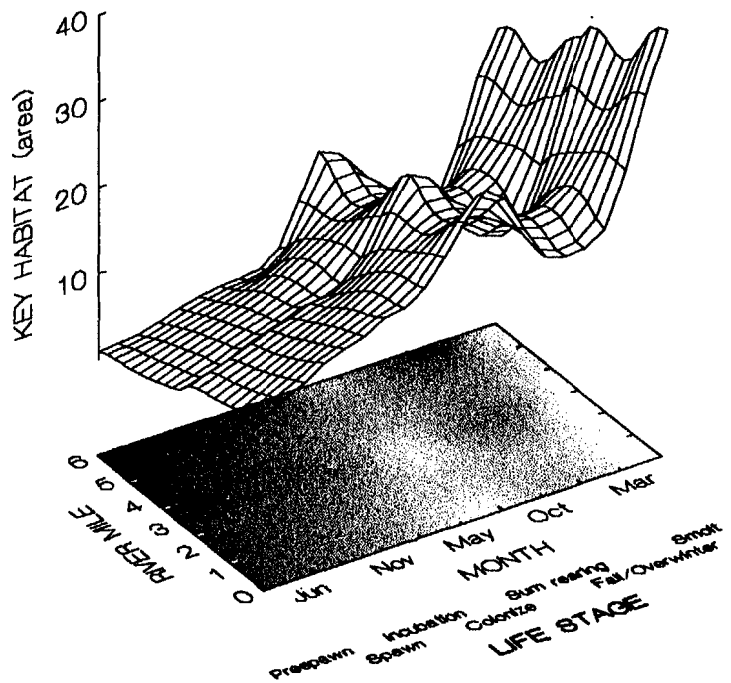
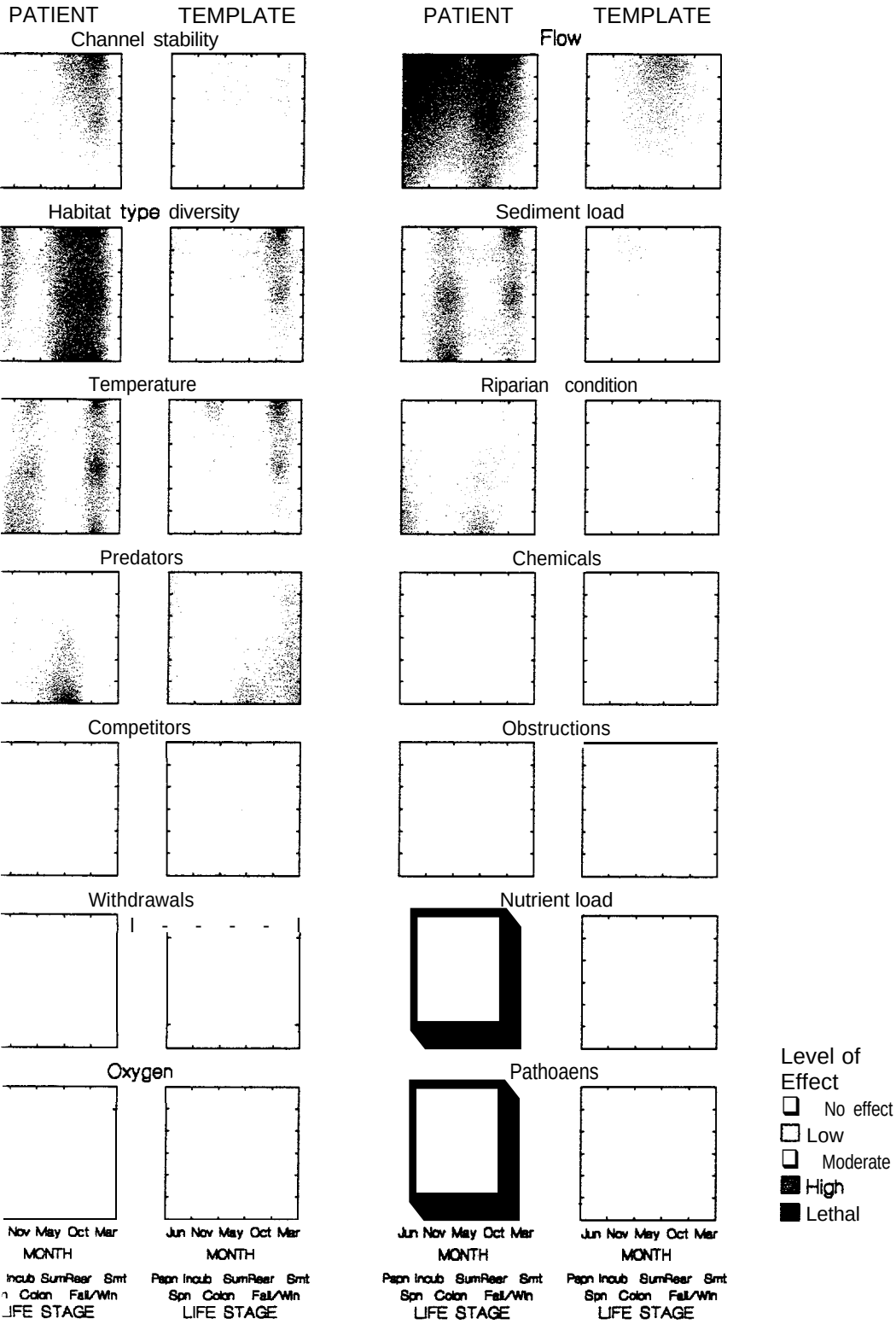
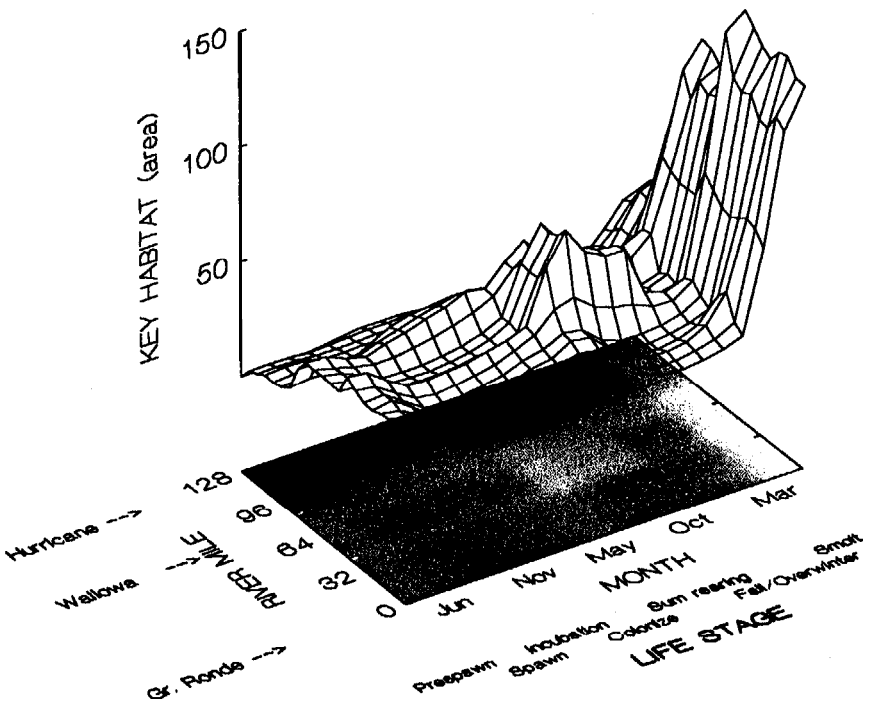


·ricane Cr Environmental Attributes



Hurricane Cr/Wallowa R/Grande Ronde R Key Habitat Quantity

Patient



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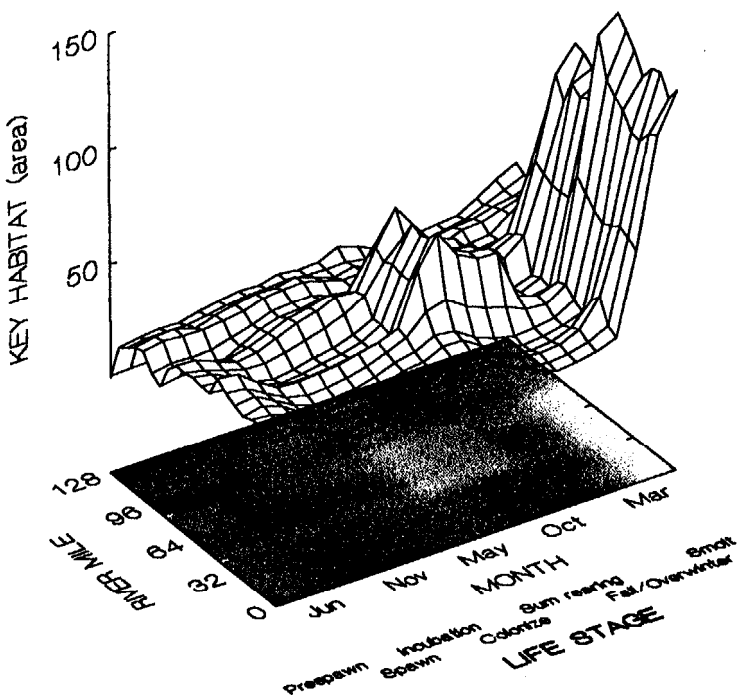
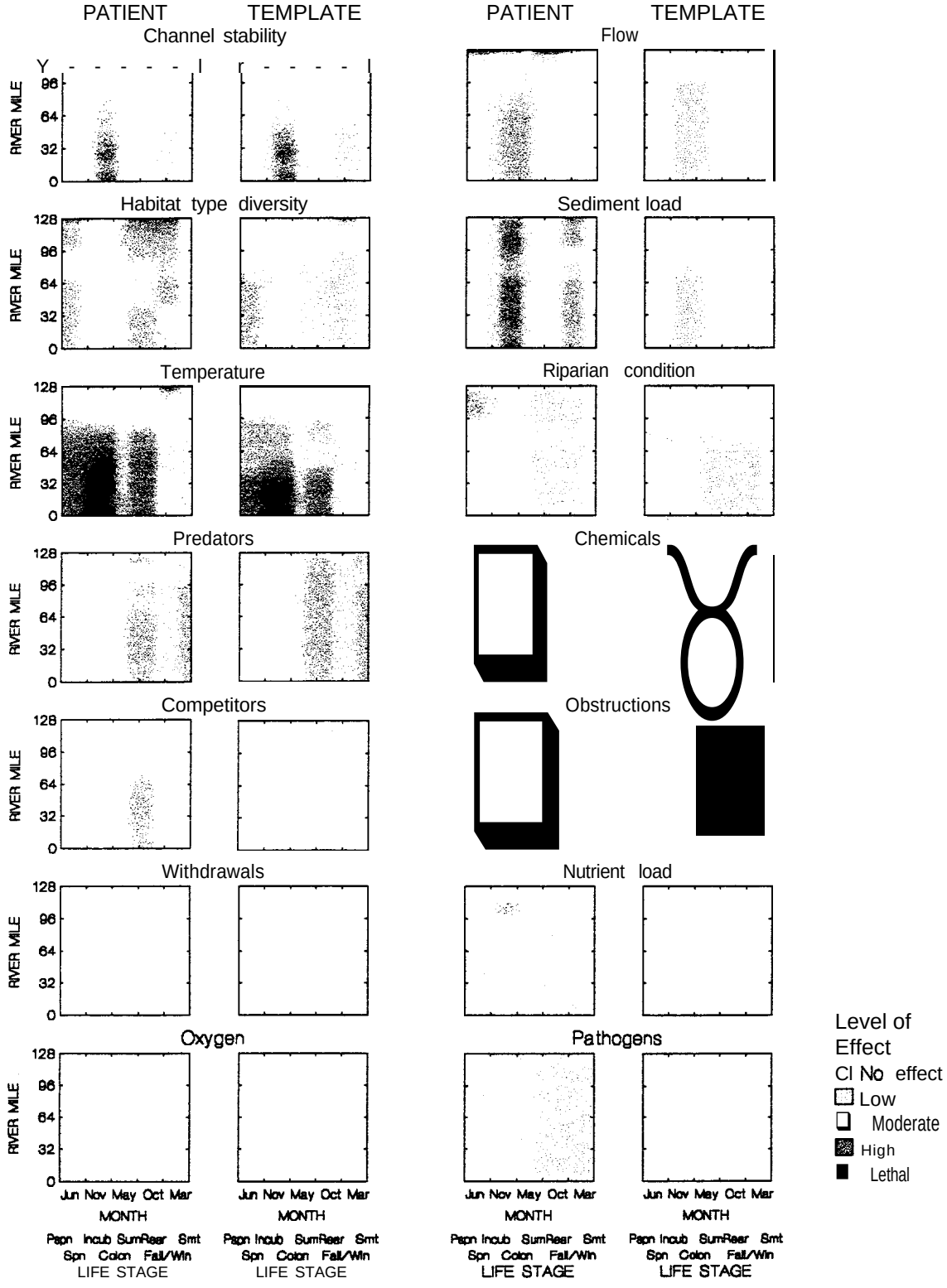
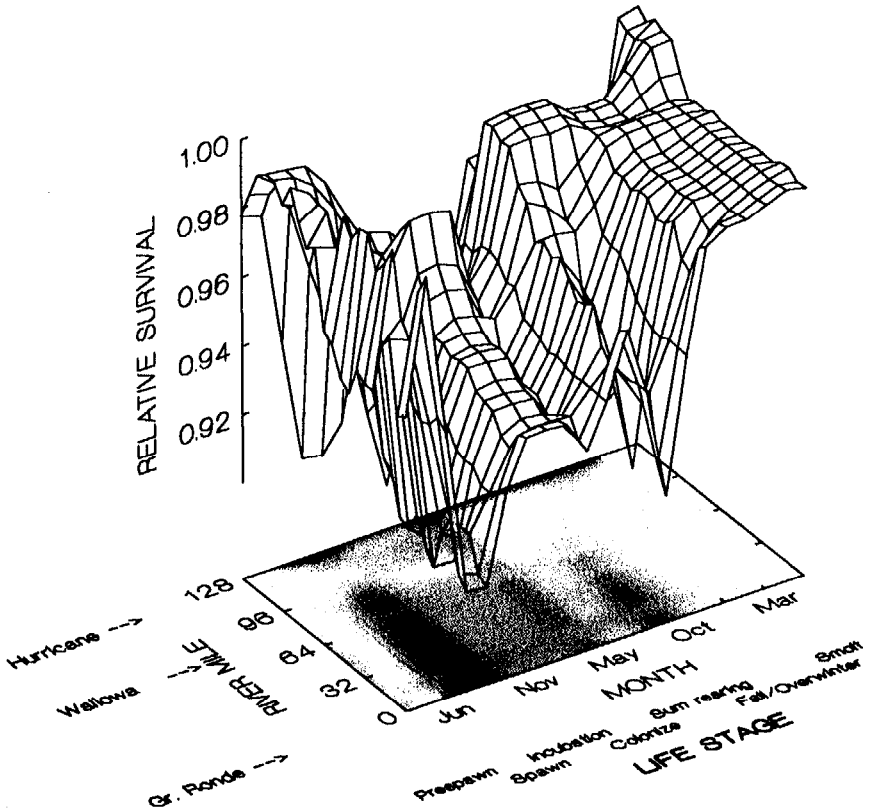


Hurricane Cr/Wallowa R/Grande Ronde R
Environmental Attributes



Hurricane Cr/Wallowa R/Grande Ronde R Relative Survival

Patient



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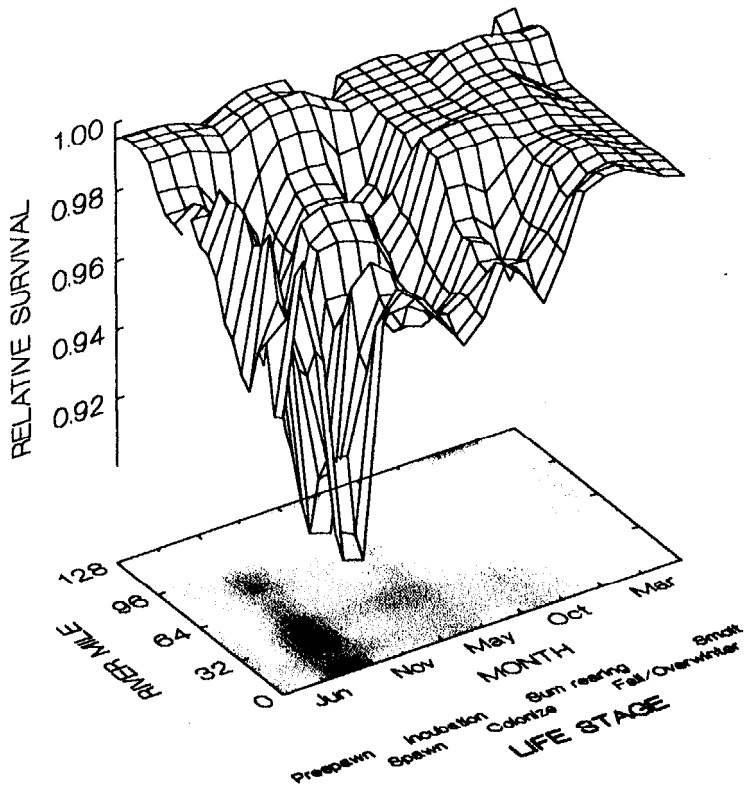


Stream Reach Range

Prairie Cr / Wallowa R / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Prairie Cr./Wallowa R./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for all life stages of spring chinook throughout most of the Prairie Creek drainage has been greatly increased compared to historic levels. These changes are most dramatic in the upper portions of the drainage, as seen in OK Gulch (Hays and Pratt forks are not depicted in the landscapes). The reason for this increase is the addition of water into the drainage through the irrigation system. Water, withdrawn from the Wallowa River near the outlet of Wallowa Lake and from the Imnaha basin, are discharged into the Prairie subbasin, significantly enhancing flow in this system compared to historic flow levels.

The quantities of key habitat in most reaches of the Wallowa River downstream of Prairie Creek River are substantially less than historic levels, except in the lower ten miles (below Minam River) where they are relatively unchanged.

The quantity of key habitat in the Grande Ronde River downstream of the Wallowa River is nearly unchanged compared to historic levels.

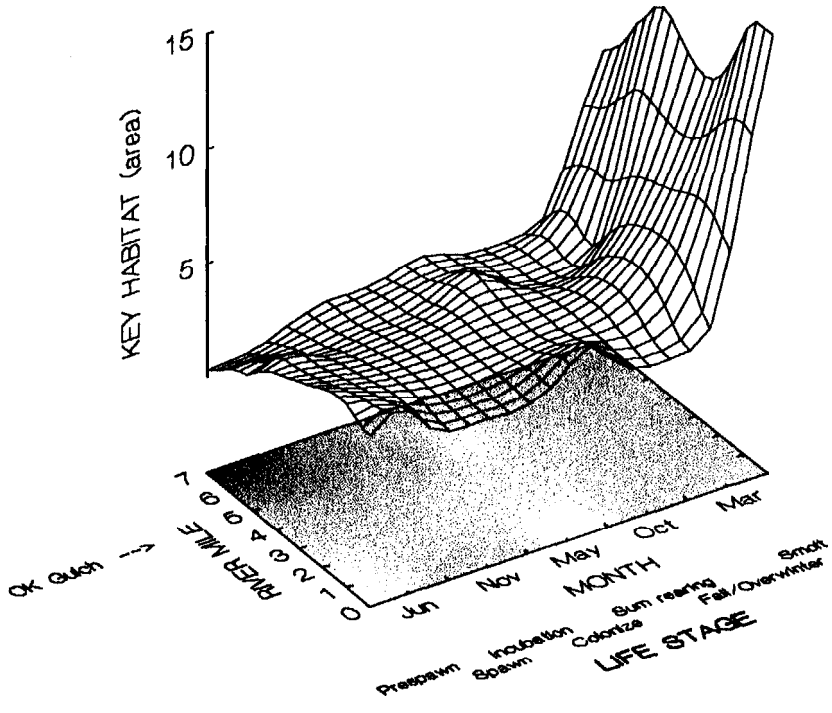
Relative Productivity (Survival)

The capability of Prairie Creek of supporting spring chinook productivity (survival) compared to historic conditions differs by life stage and stream reach. In general, historic survival conditions in the lower portion of Prairie Creek were excellent for all life stages, but worsened rapidly as distance increased from the Wallowa River due to the stream's very small size. Lack of flow was the primary environmental constraint on productivity prior to the construction of the irrigation system. Survival conditions currently are good for some life stages throughout the stream, but are poor for egg incubation. The two attributes most affecting conditions currently are sediment load and habitat diversity .

Survival conditions in the Wallowa River downstream of Prairie Creek have worsened compared to those that existed historically, although the lower portions of the river have always been moderately unfavorable for survival during some life stages. Conditions have also worsened in the Grande Ronde River downstream of the Wallowa River. However, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages in the lower Grande Ronde River. These conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

OK Gulch/Prairie Cr Key Habitat Quantity

Patient



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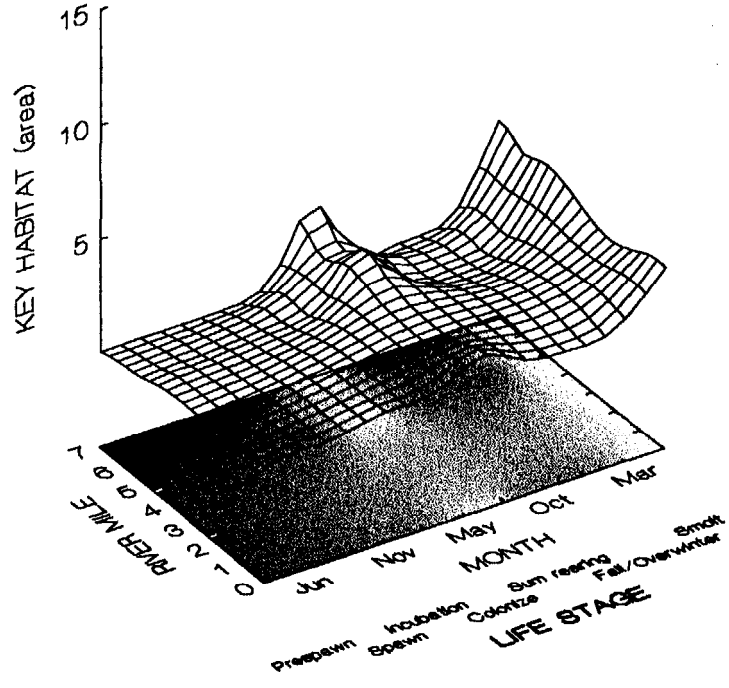
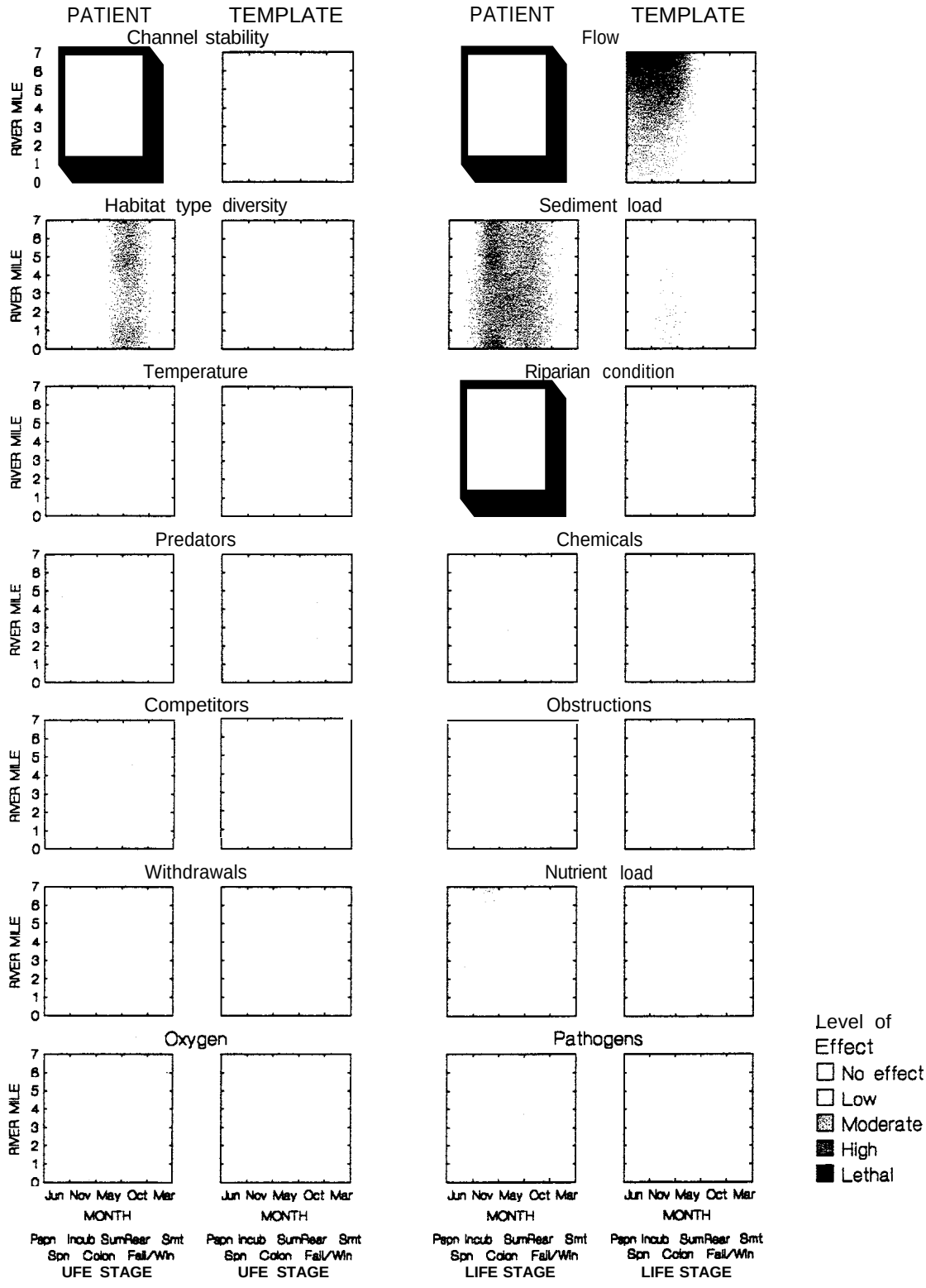
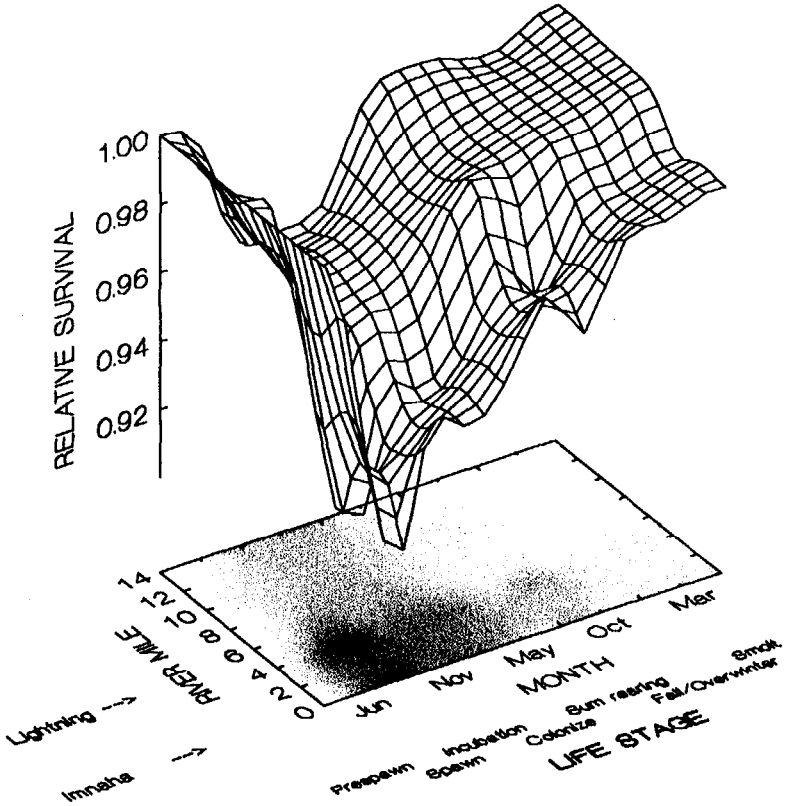


OK Gulch/Prairie Cr Environmental Attributes



Lightning Cr/Imnaha R Relative Survival

Patient



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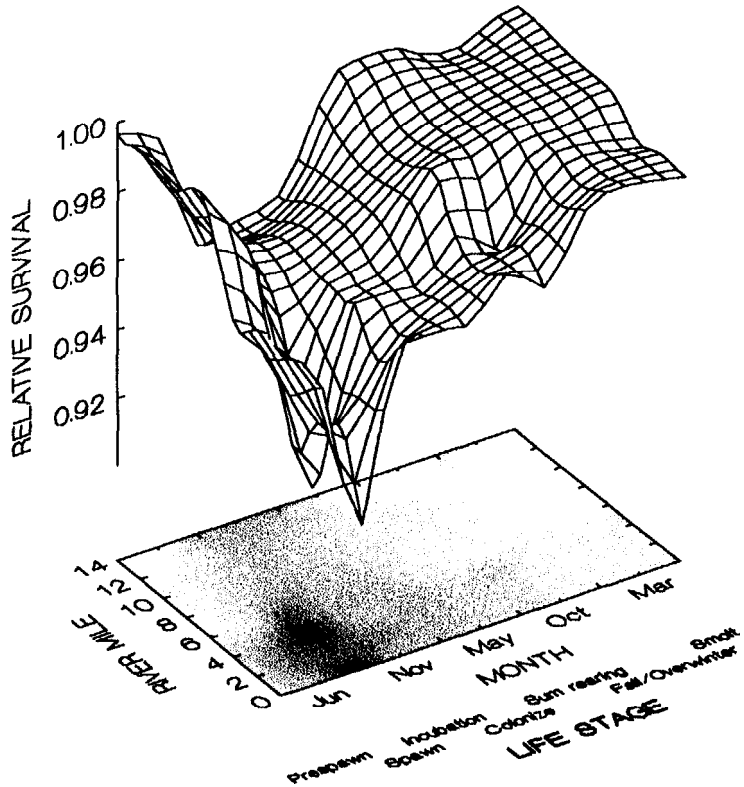
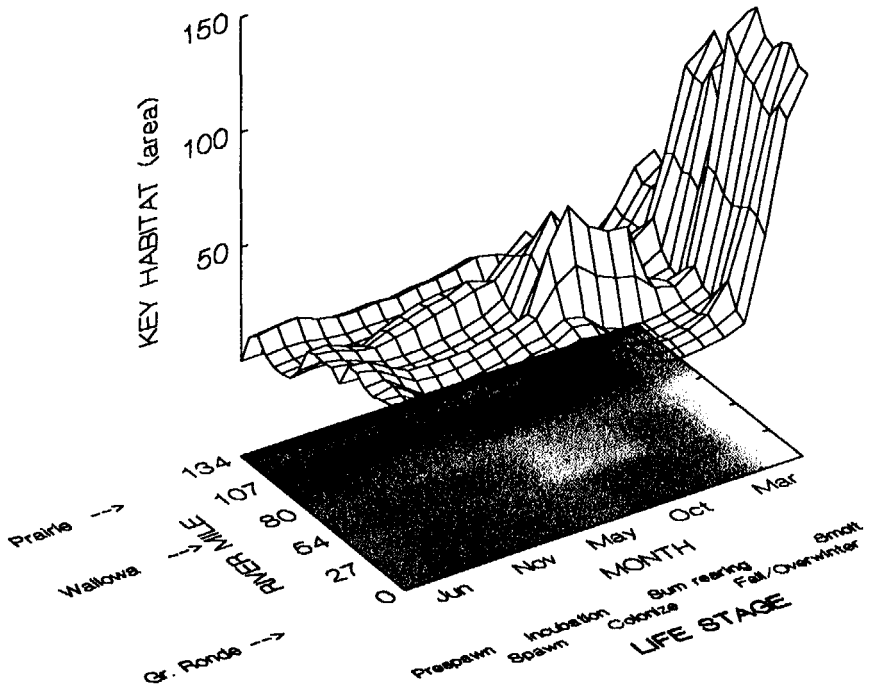


OK Gulch/Prairie Cr/Wallowa R/Grande Ronde a Key Habitat Quantity

Patient



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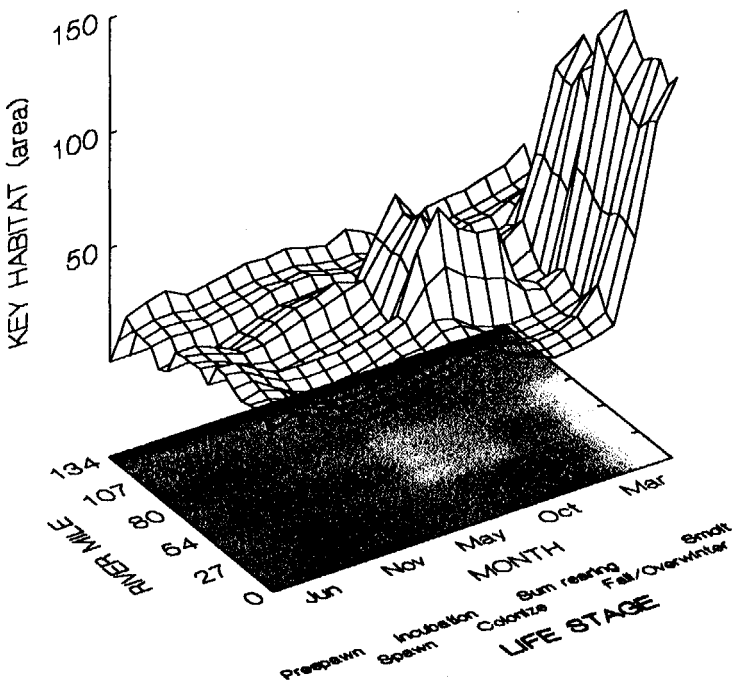
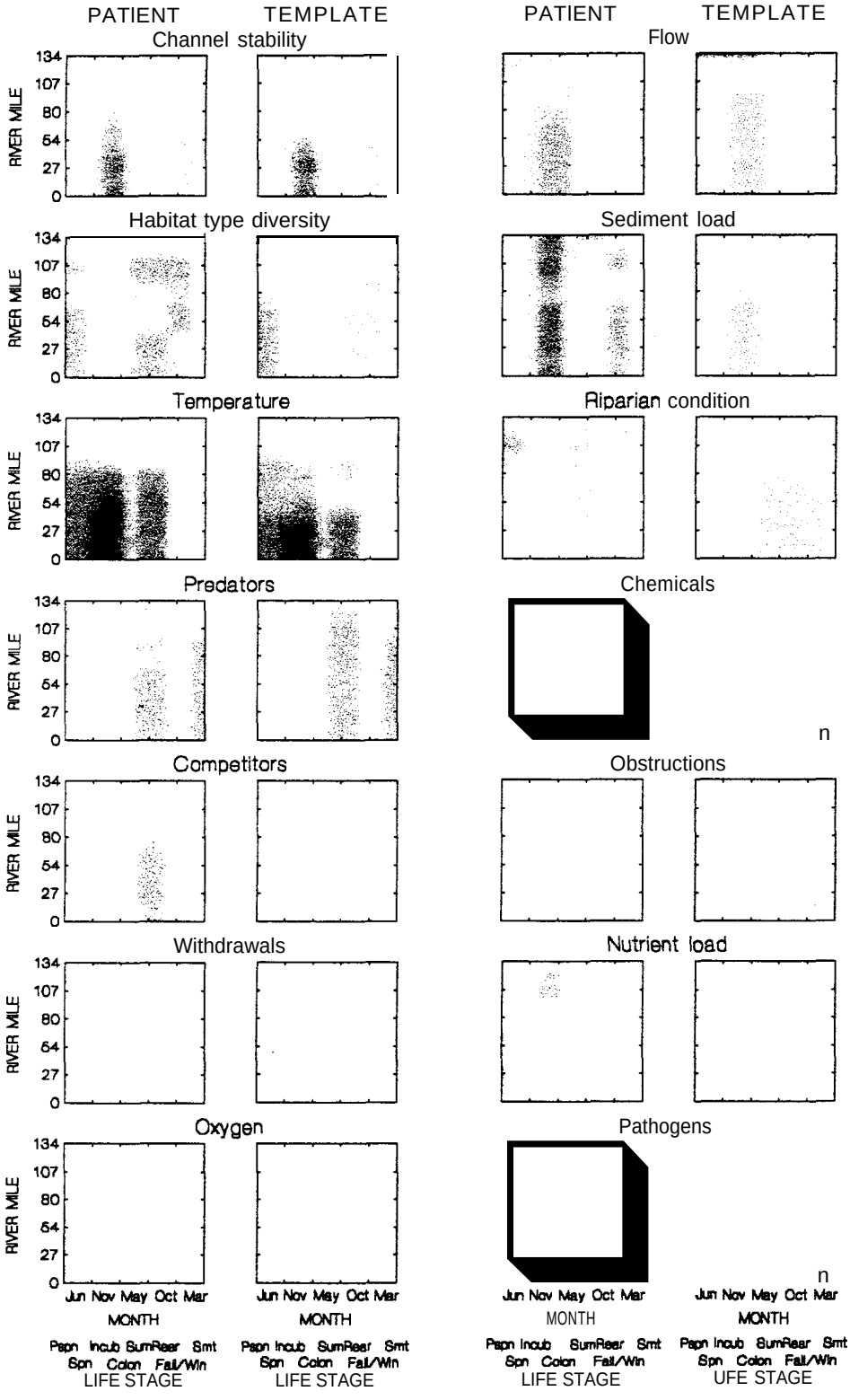


Prairie Cr/Wallowa R/Grande Ronde R
Environmental Attributes

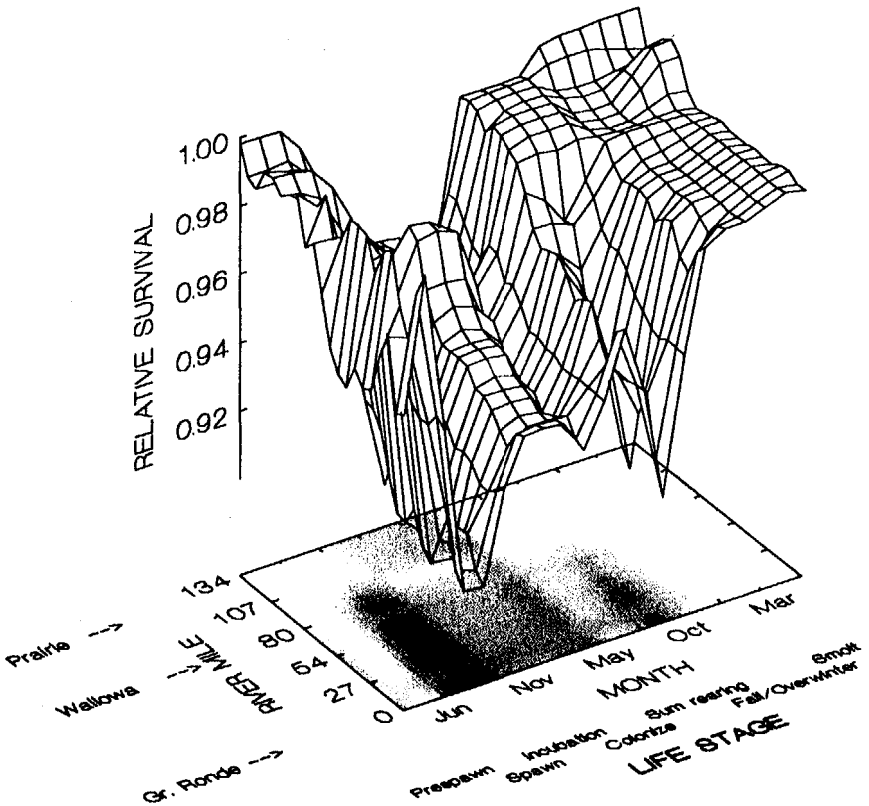


Level of Effect

- ❑ No effect
- ❑ Low
- ❑ Moderate
- ❑ High
- , Lethal

OK Gulch/Prairie Cr/Wallowa R/Grande Ronde R Relative Survival

Patient



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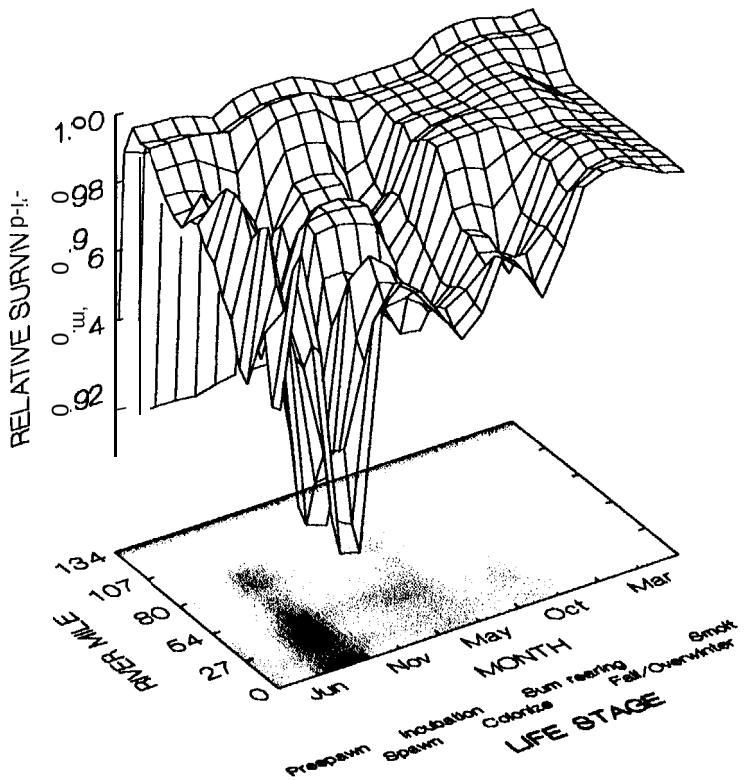


Stream Reach Range

Lookingglass Cr / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Lookingglass Cr./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Lookingglass Creek is changed little compared to historic levels.

The quantity of key habitat in the Grande Ronde River downstream of Lookingglass Creek is virtually unchanged compared to historic levels.

Compared to the Grande Ronde River, Lookingglass Creek contains relatively little key habitat.

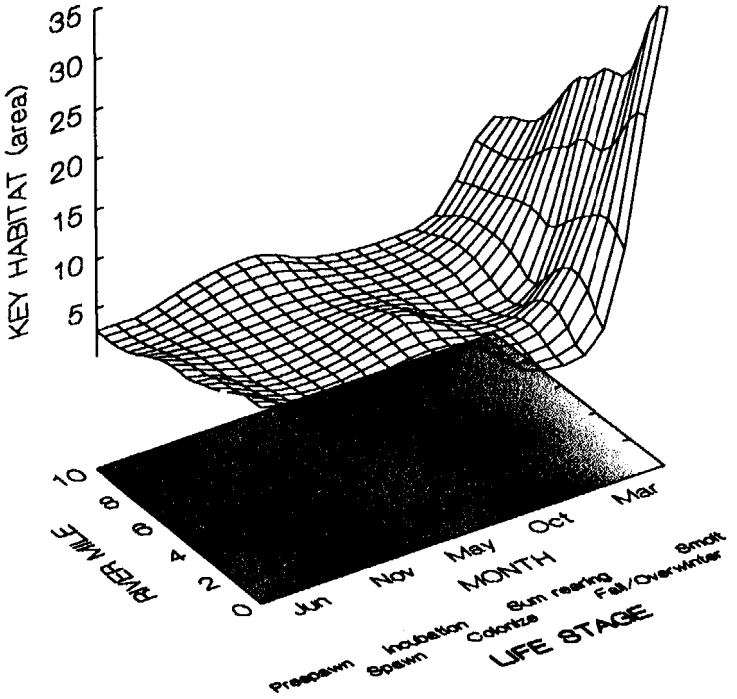
Relative Productivity (Survival)

The capability of Lookingglass Creek of supporting spring chinook productivity (survival) is largely unchanged compared to historic conditions for all life stages.

Survival conditions within the Grande Ronde River downstream of Lookingglass have worsened compared to those that existed historically, although these reaches have always been unfavorable for survival during some life stages. In particular, survival conditions have always been poor in the later part of the prespawning stage and during the spawning and incubation stages. Current survival conditions are mainly due to elevated water temperatures, sediment load, channel stability, habitat diversity, and the presence of predators.

Lookingglass Cr Key Habitat Quantity

Patient



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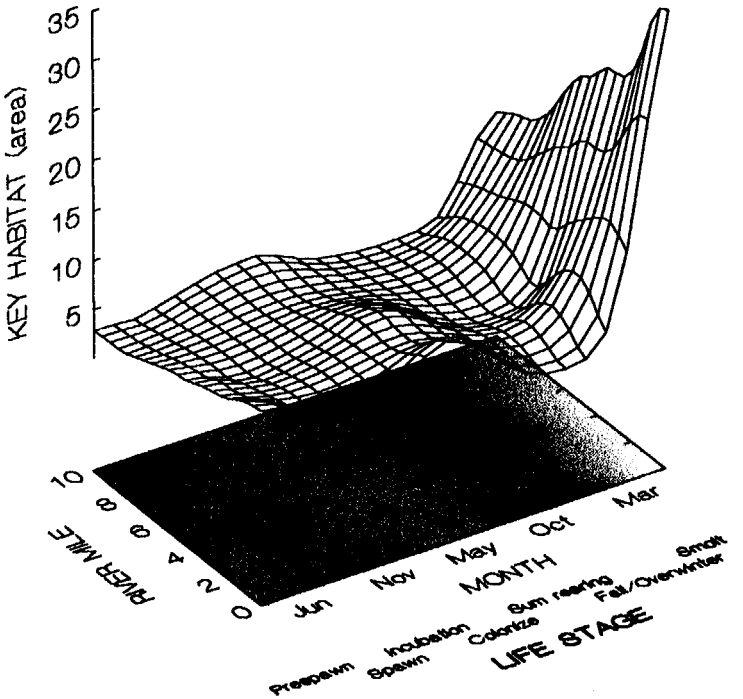
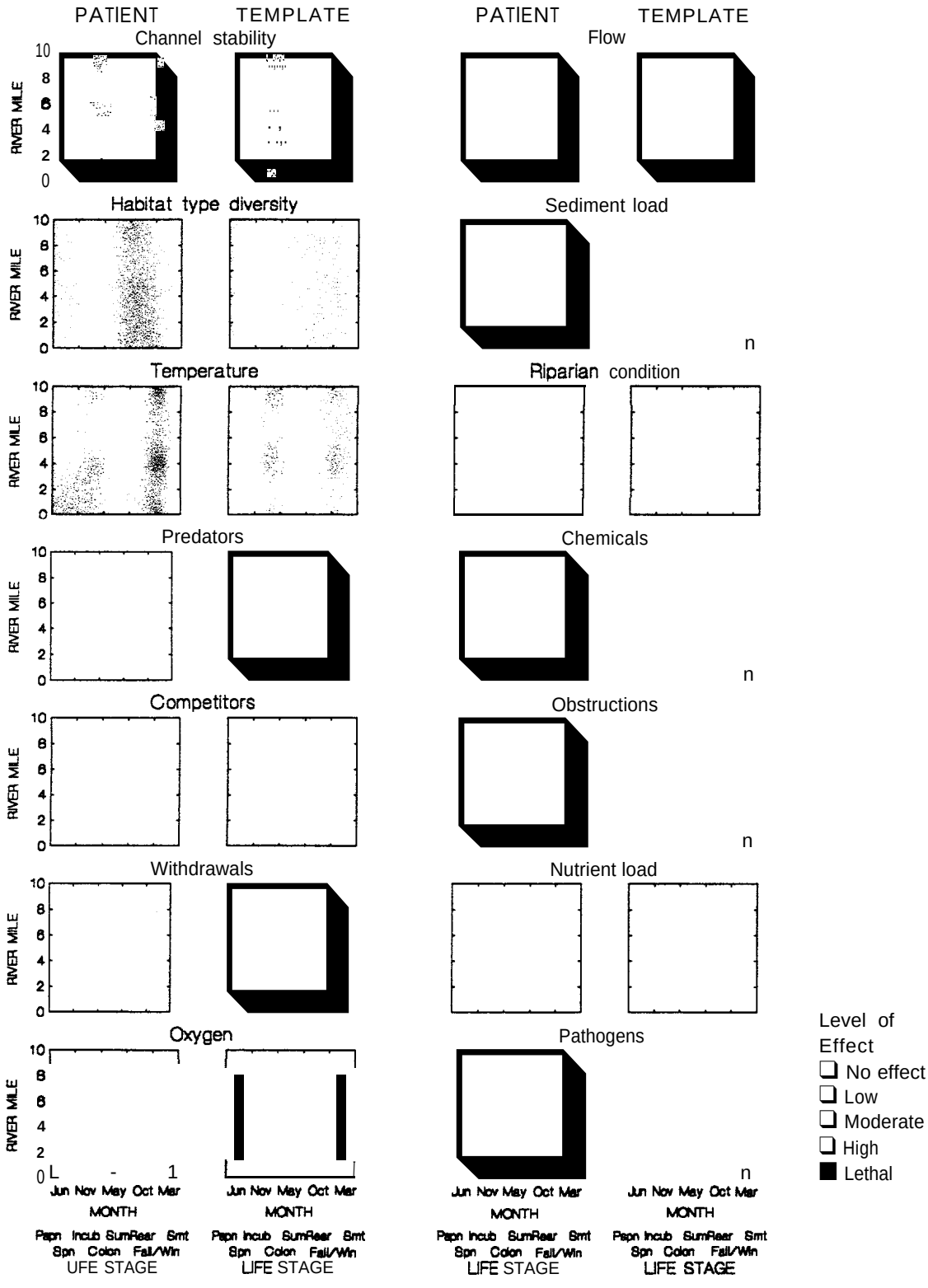
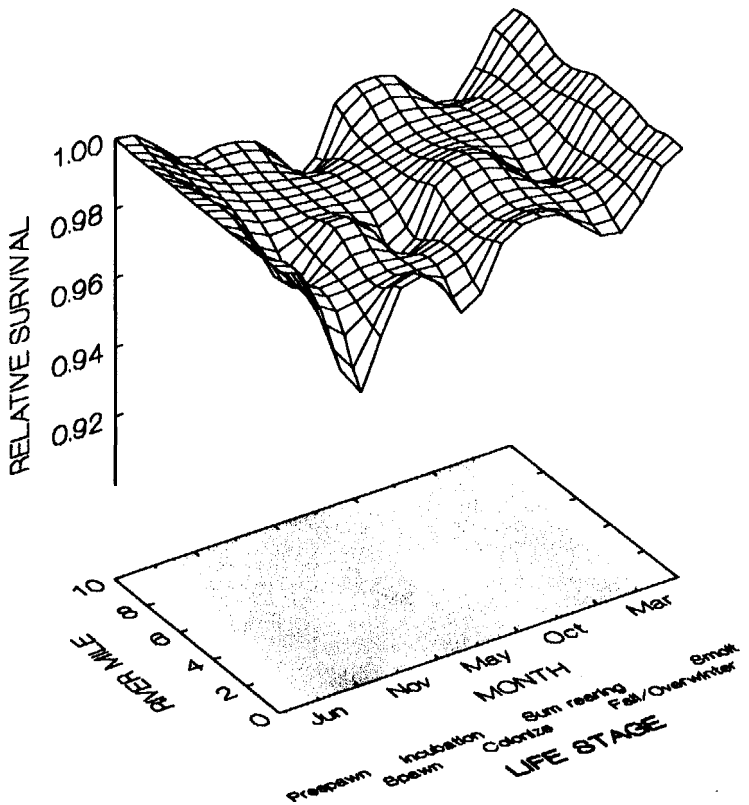


Lookingglass Cr Environmental Attributes



ookingglass Cr Relative Surv val

Patient



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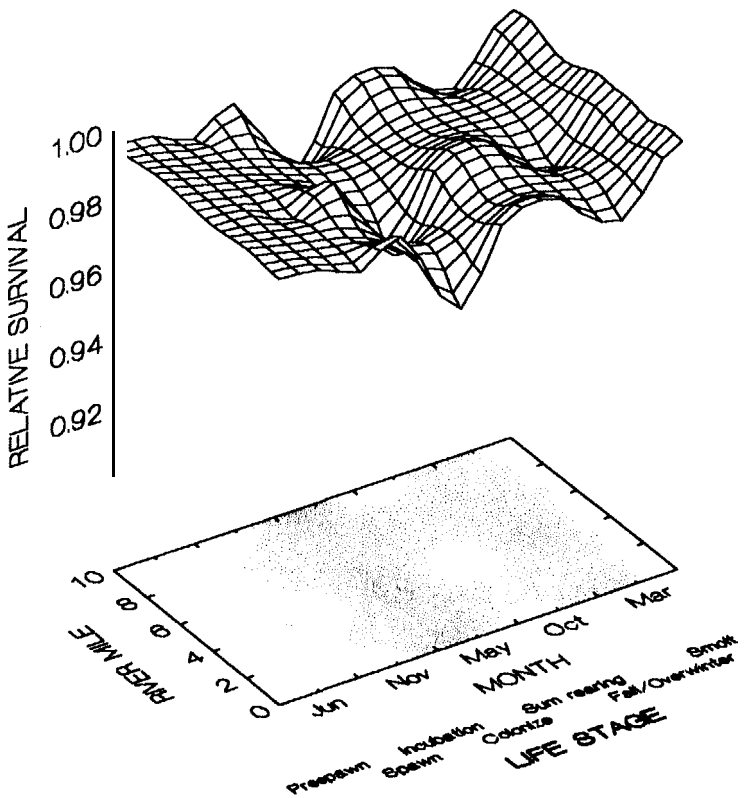
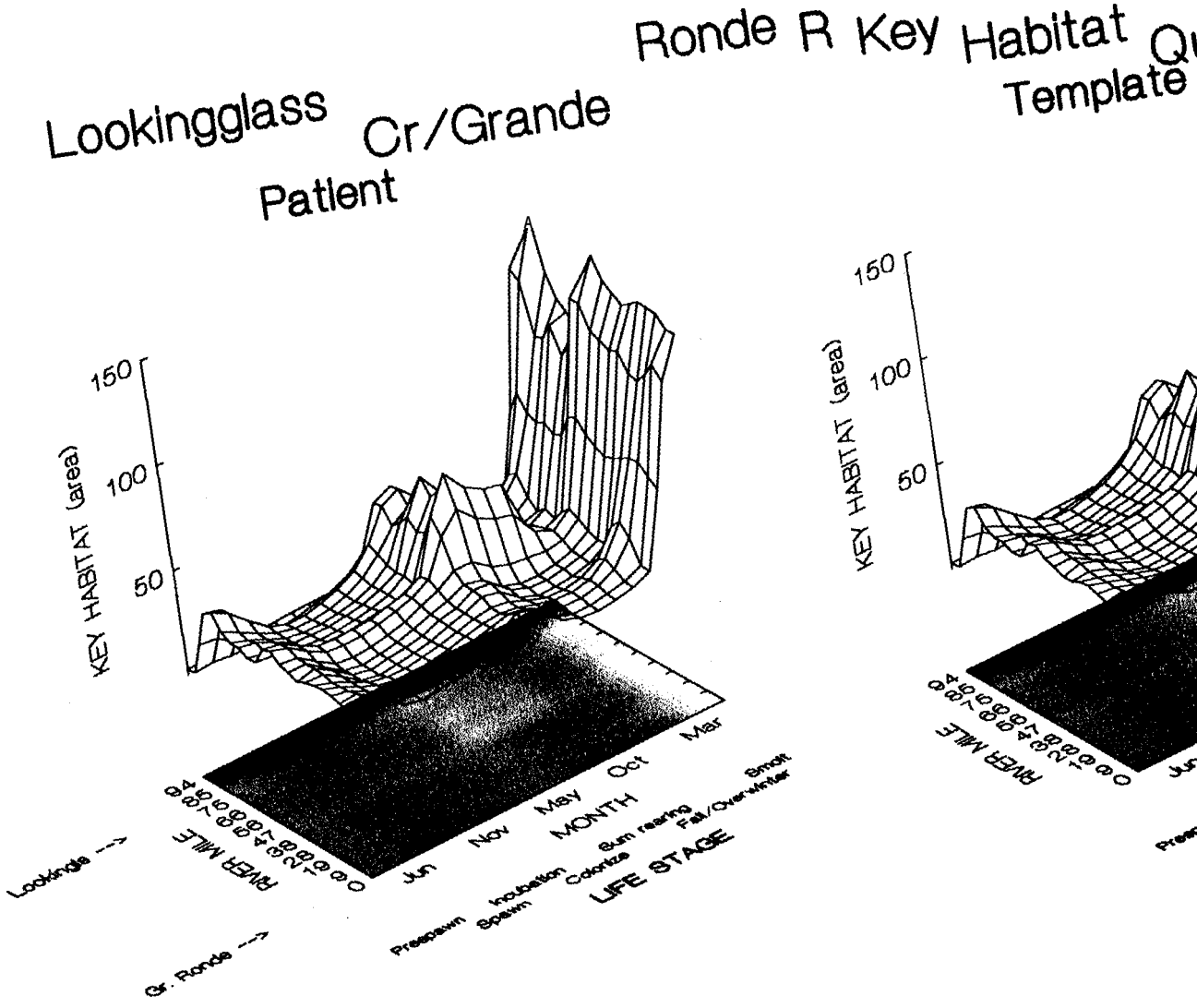
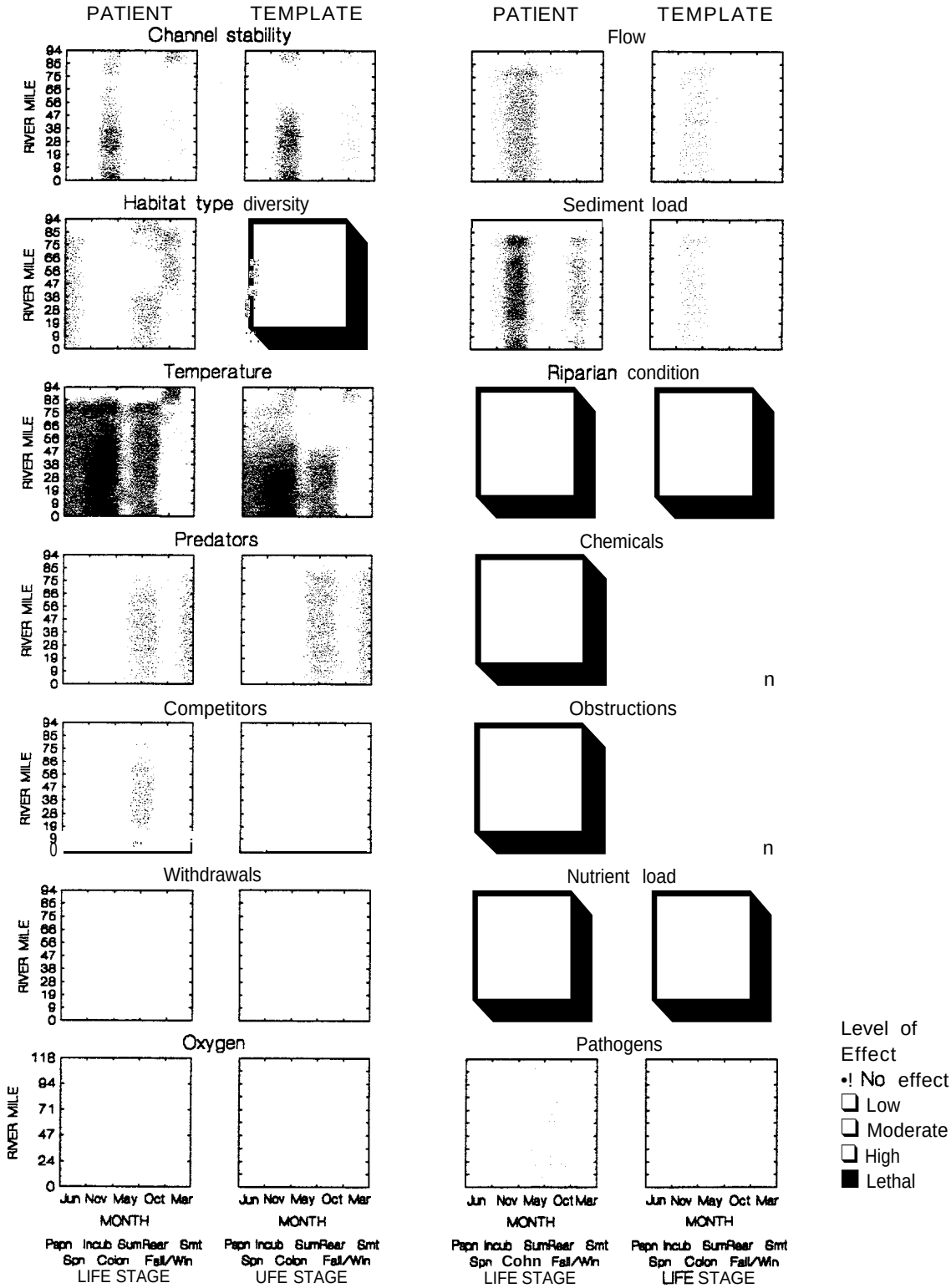
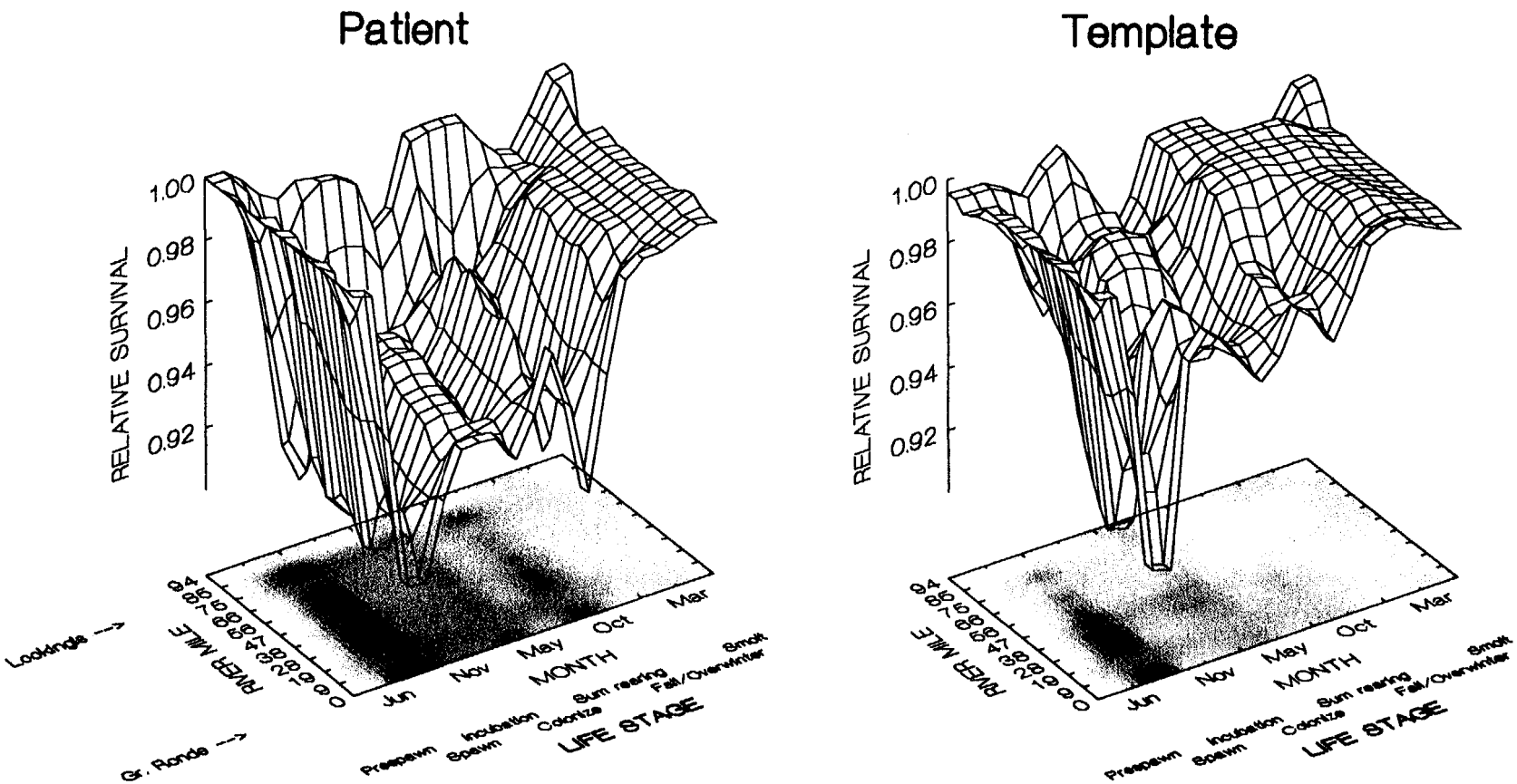



Lookingglass
Cr/Grande
Patient
Ronde R Key Habitat
Template
KEY HABITAT (area)
150
100
50
RIVER MILE
Lookingle -->
Gr. Ronde -->
Jun
Nov
May
Oct
Mar
MONTH
Prespawn
Incubation
Spawn
Colorize
Sum rearing
Fall/Overwinter
Smolt
LIFE STAGE

Lookingglass Cr/Grande Ronde R
Environmental Attributes



Lookingglass Cr/Grande Ronde R Relative Surviva



Stream Reach Range

Catherine Cr / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Catherine Cr./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Catherine Creek is greatly reduced compared to historic levels. These losses are due to land development, channel straightening and realignment, removal of large organic structure from the channel, and dewatering of the channel. Loss of key habitat has occurred for nearly every life stage, but it has been particularly severe for the prespawning, fry colonization, summer rearing, and overwintering life stages.

The quantity of key habitat within the Grande Ronde River downstream of Catherine Creek is substantially reduced compared to historic levels for a distance of approximately 30 miles. These losses have been greatest for the spawning, egg incubation, fry colonization, and overwintering life stages. Further downstream, loss in key habitat has been comparatively minor.

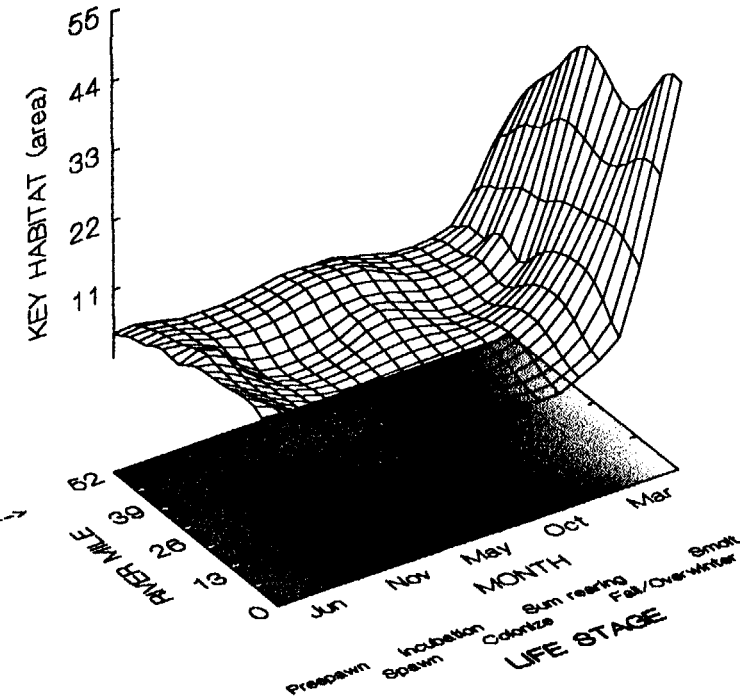
Relative Productivity (Survival)

The capability of Catherine Creek of supporting spring chinook productivity (survival) is sharply reduced compared to historic conditions for nearly every life stage. This reduction has been most severe in the lower 40 miles of stream, with conditions improving in the upper stream reaches. Survival conditions approach historic levels for some life stages in the Catherine Creek forks. “Survival conditions are especially low in the later phase of the prespawning stage and in the spawning, incubation, fry colonization, and summer rearing stages in the lower 30 miles of stream. Survival conditions have declined in these reaches due primarily to increased water temperature, increased sediment load, loss in habitat diversity, loss in flow, channel and bank destabilization, and alteration of the riparian corridor.

The capability of the Grande Ronde River for approximately 70 miles downstream of Catherine Creek for supporting spring chinook productivity is sharply reduced compared to historic conditions for many life stages. This loss has been most severe for a distance of approximately 40 miles downstream of Catherine Creek. Survival conditions in these reaches are especially poor in the prespawning, spawning, incubation, and summer rearing life stages. Survival conditions have declined in these reaches due primarily to increased water temperature during mid to late summer, increased sediment load, alteration of runoff patterns, and channel destabilization.

Catherine Cr Key Habitat Quantity

Patient



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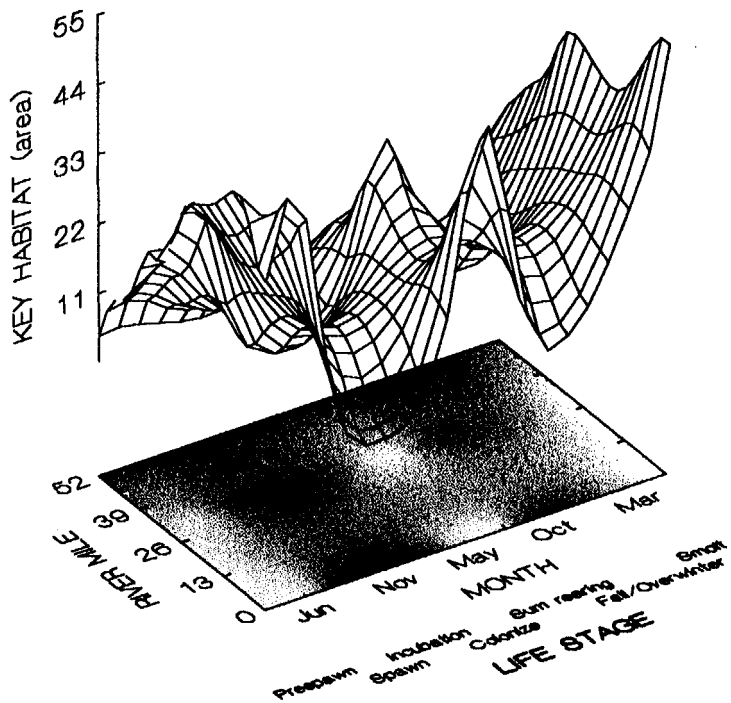
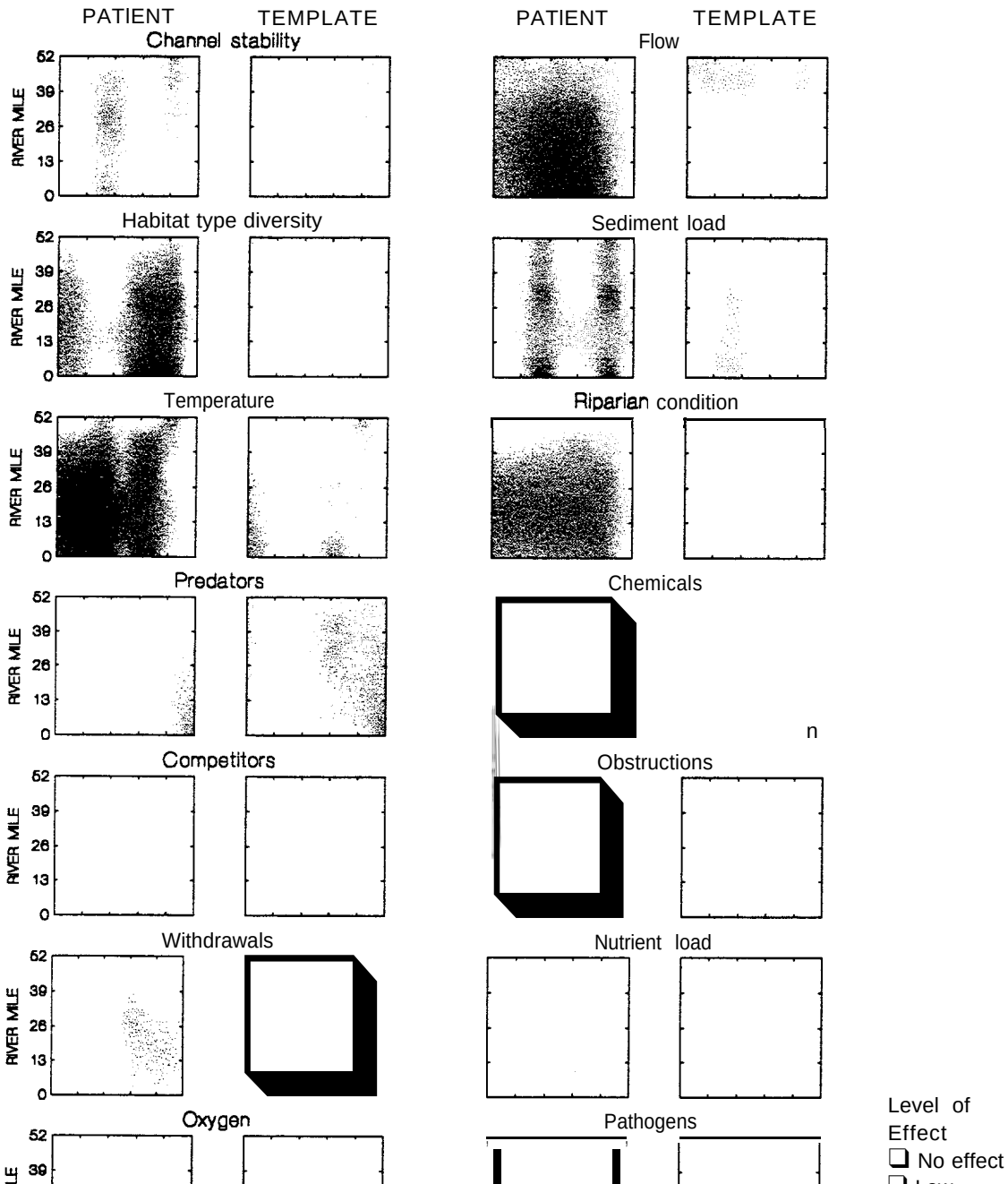
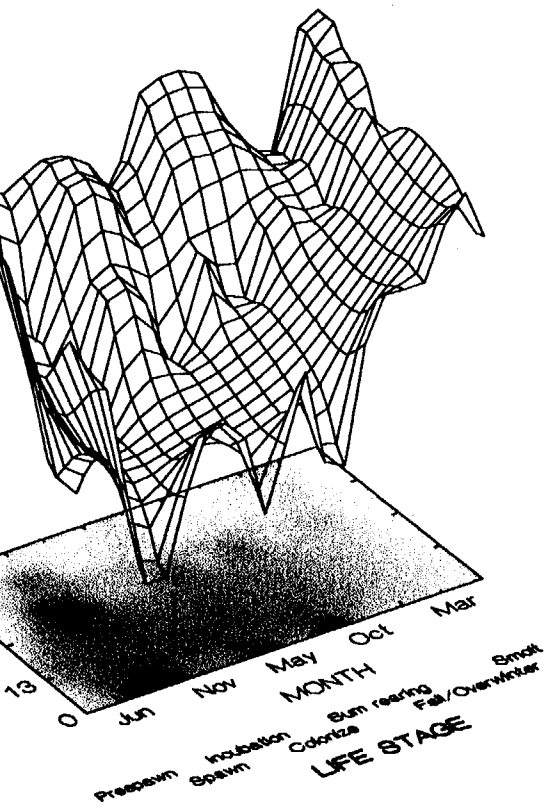


Catherine Cr Environmental Attributes



Catherine Cr Relative Survival

Patient



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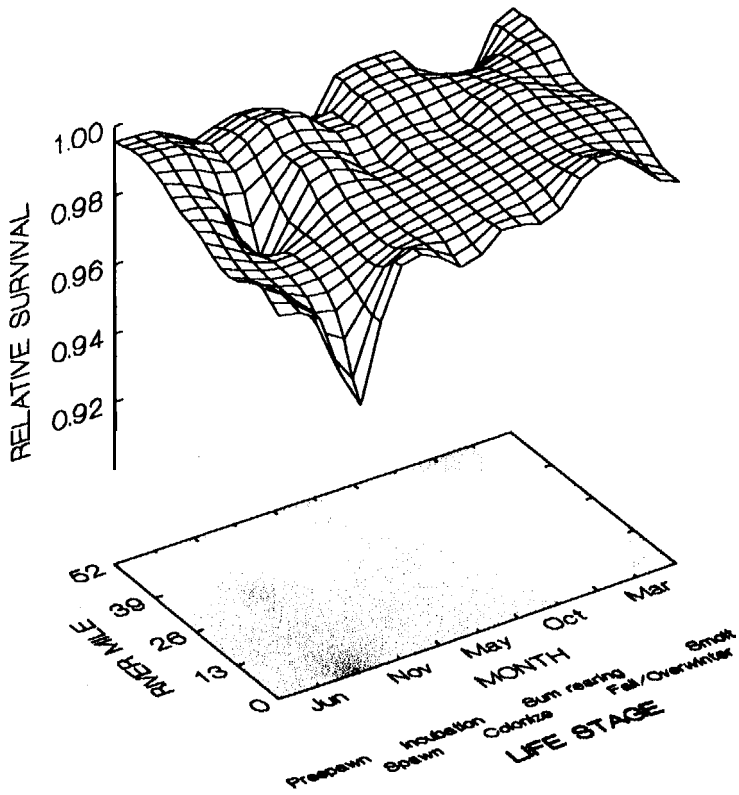
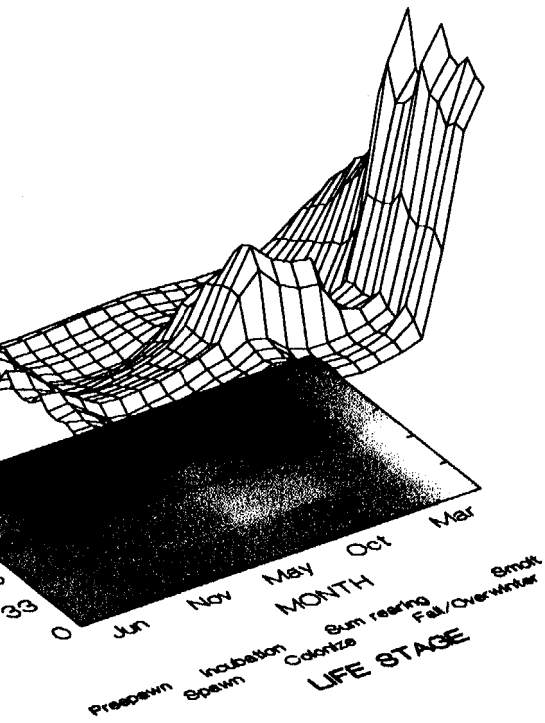


nerin Cr/Grande Ronde R Key Habitat Quantity

Patient



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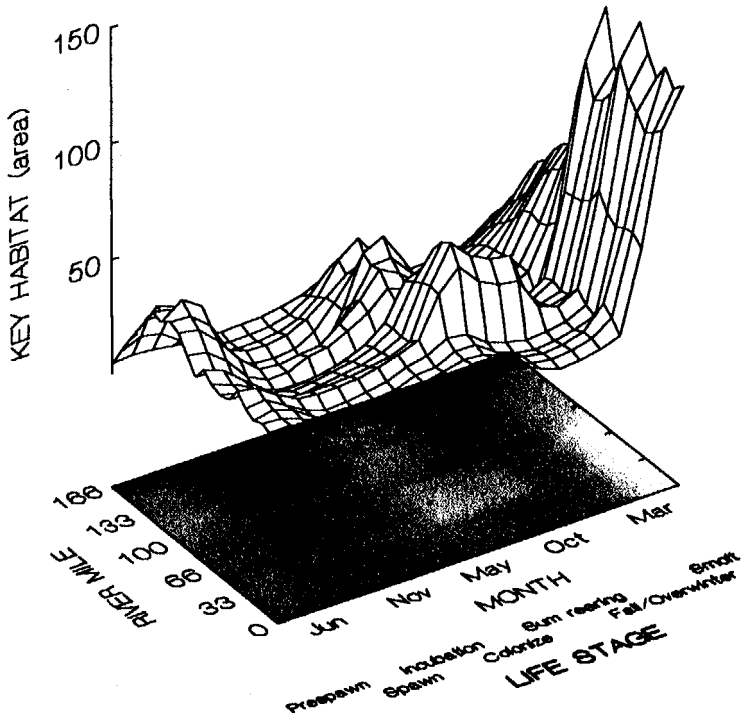
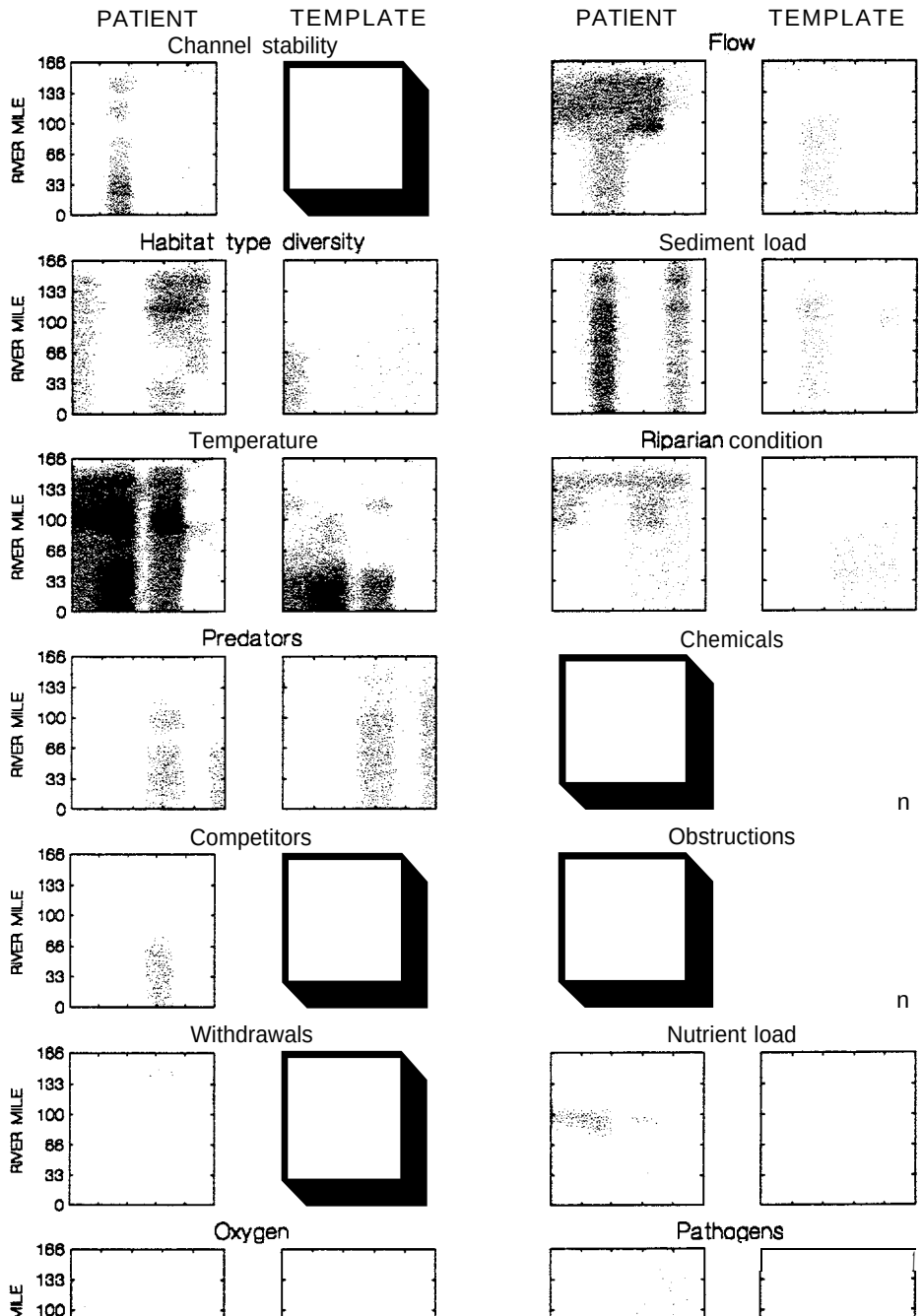


Catherine Cr/Grande Ronde R Environmental Attributes

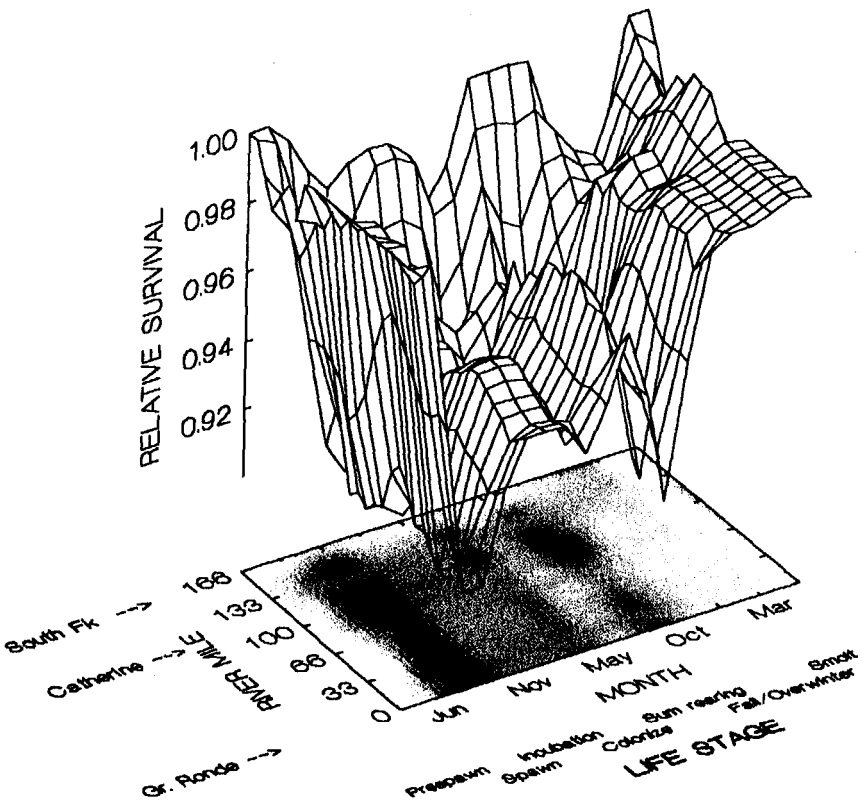


Level of Effect

- ❑ No effect
- ❑ Low

Catherine Cr/Grande Ronde R Relative Survival

Patient



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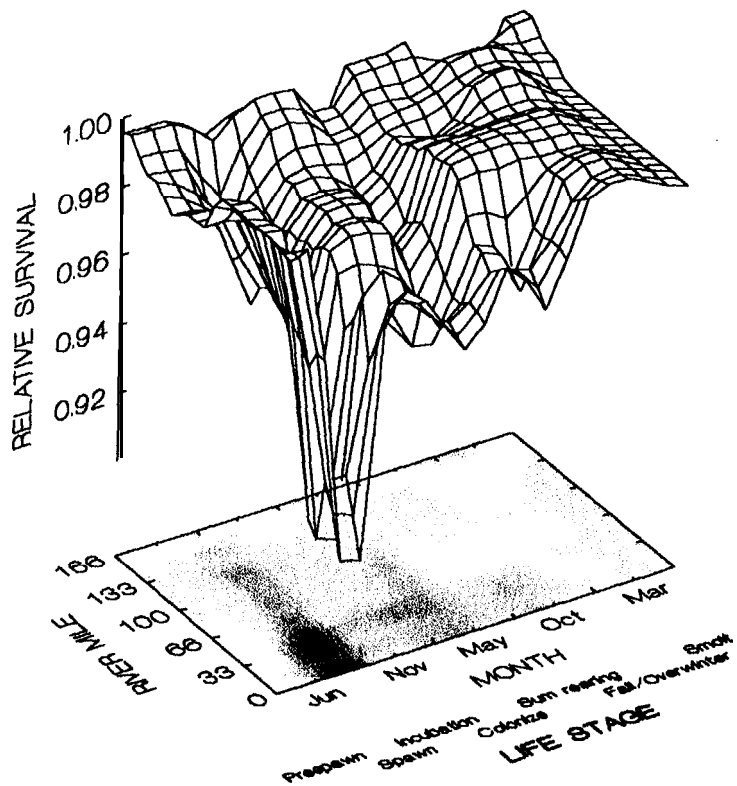


Stream Reach Range

Sheep Cr / Grande Ronde R

Patient-Template Analysis Summary

Stream Reach Range: Sheep Cr./Grande Ronde R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Sheep Creek is substantially reduced compared to historic levels for most life stages. These losses are greatest for the prespawning, spawning, egg incubation, and overwintering life stages.

The quantity of key habitat in the Grande Ronde River downstream of Sheep Creek and extending to below the Grande Ronde valley is greatly reduced for certain life stages compared to historic levels. Changes in quantity of key habitat downstream of the valley have been comparatively minor.

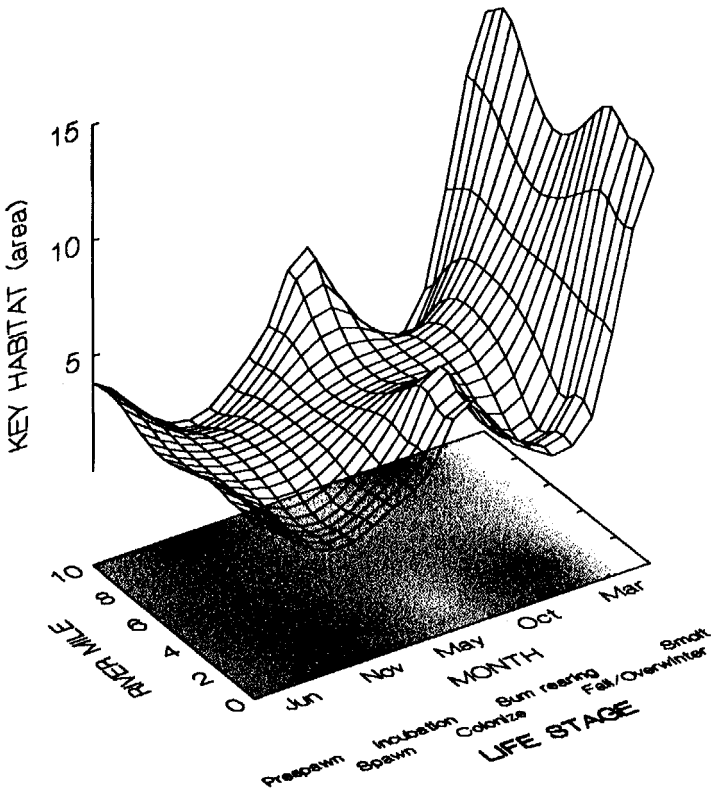
Relative Productivity (Survival)

The capability of Sheep Creek of supporting spring chinook productivity (survival) is sharply reduced compared to historic conditions for nearly every life stage. Survival conditions are especially low in the later phase of the prespawning stage and in the spawning stage. Conditions are also relatively poor in the fry colonization, summer rearing, and overwintering stages. Survival conditions have declined in these reaches due primarily to increased water temperature, increased sediment load, loss in habitat diversity, changes in flow patterns, and alteration of the riparian corridor. Historic survival conditions in this stream were excellent.

The capability of the mainstem Grande Ronde River of supporting spring chinook productivity downstream of Sheep Creek is greatly reduced for most life stages compared to historic conditions. This reduction has been most severe within the Grande Ronde valley and continues for most of the distance upstream. Survival conditions have also declined markedly downstream of the valley reaches, although historic conditions there were naturally poor for some life stages in the lower 50 miles. Current survival conditions remain similar to what they were historically for the prespawning and smelt life stages over most the of the river and in the overwintering stage in some portions of the lower river. Survival conditions have changed in these reaches due primarily to increased water temperature, increased sediment load, loss in habitat diversity, changes in flow patterns, channel and bank destabilization, and alteration of the riparian zone.

Sheep Cr Key Habitat Quantity

Patient



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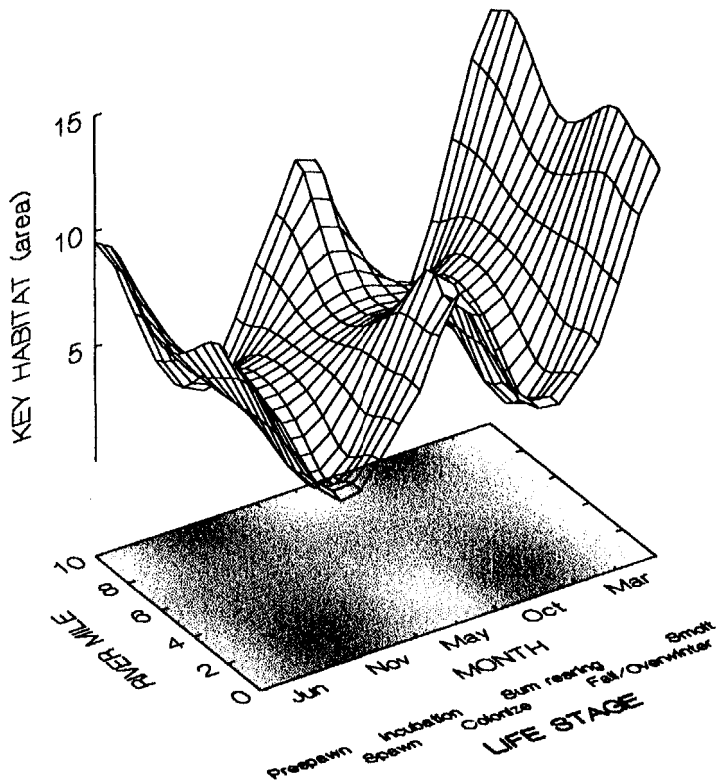
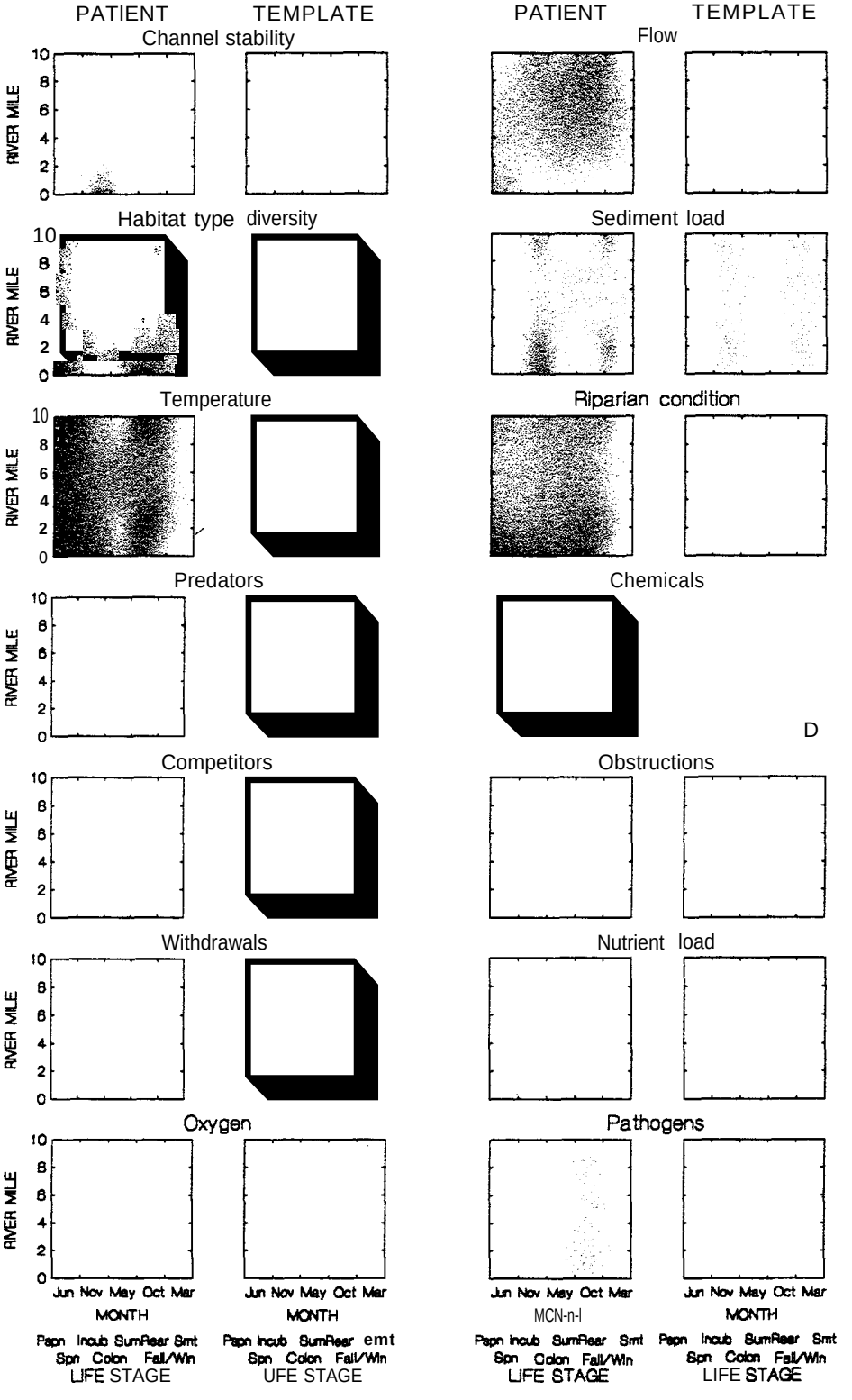


Sheep Cr Environmental Attributes

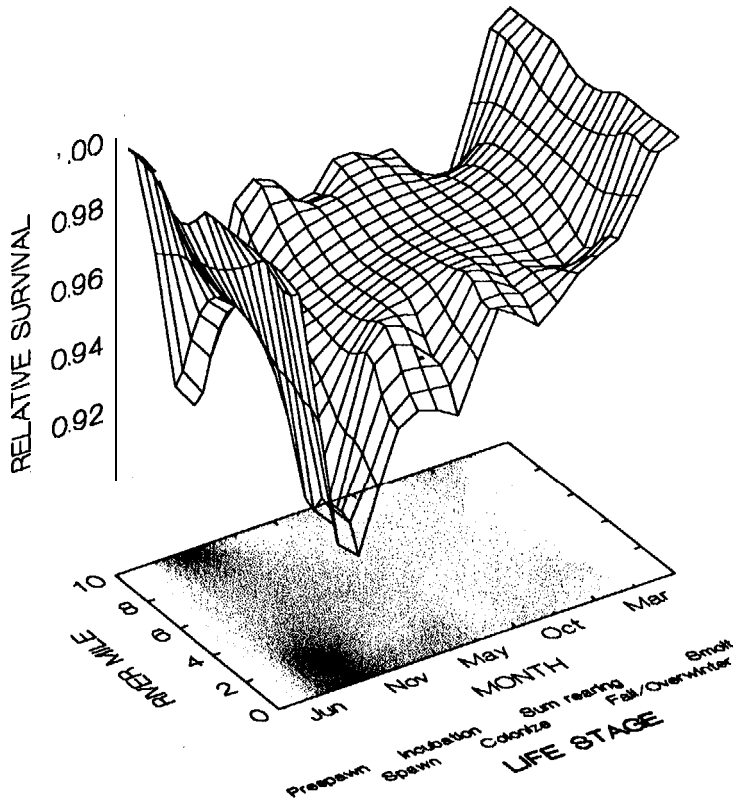


Level of Effect

- ❑ No effect
- ❑ Low
- ❑ Moderate
- ❑ High
- ■ Lethal

Sheep Cr Relative Survival

Patient



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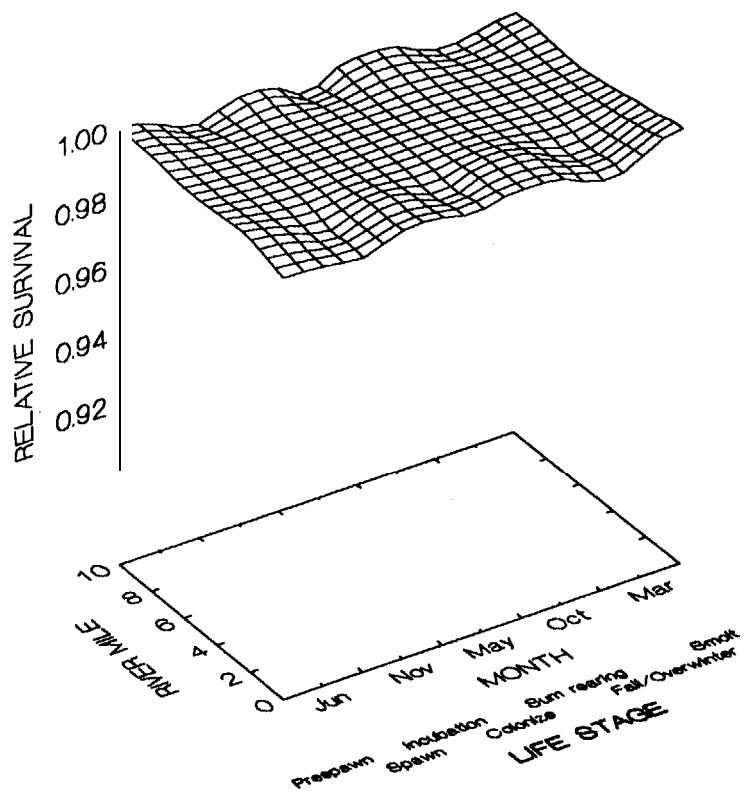
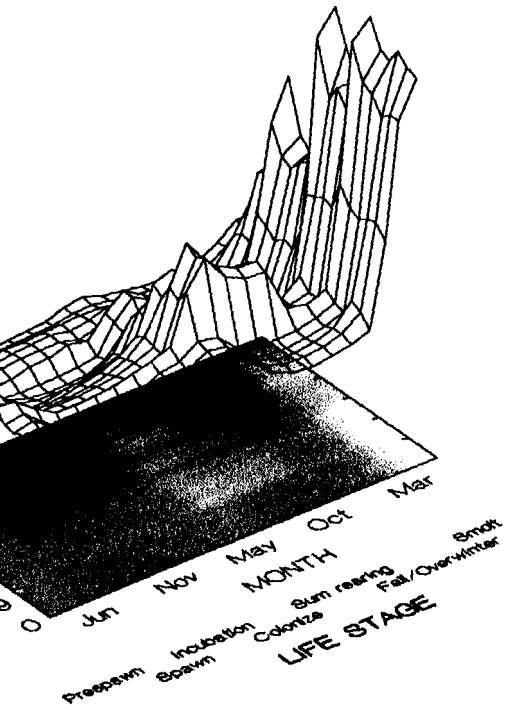


Cr Grande Rond R Key Hab t% Quantity

Patient



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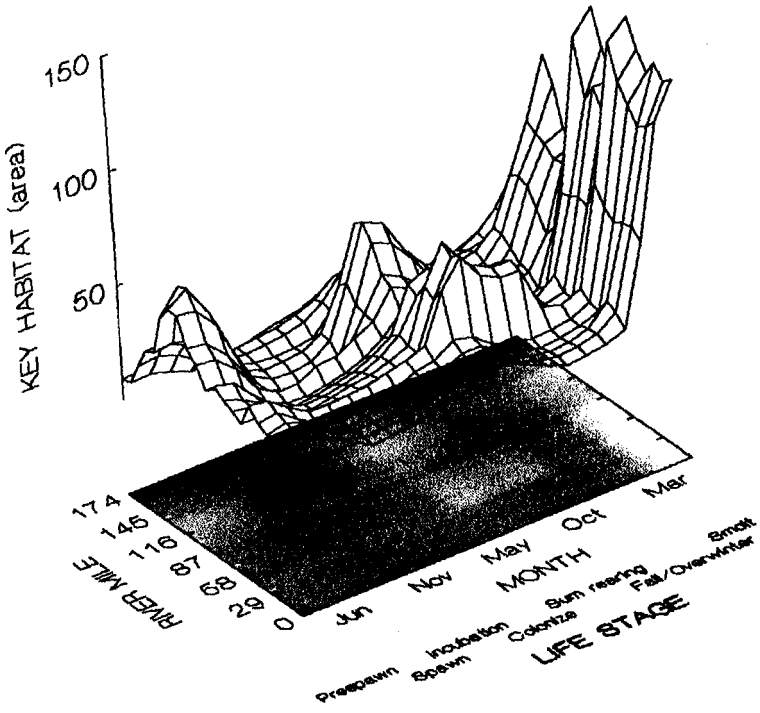
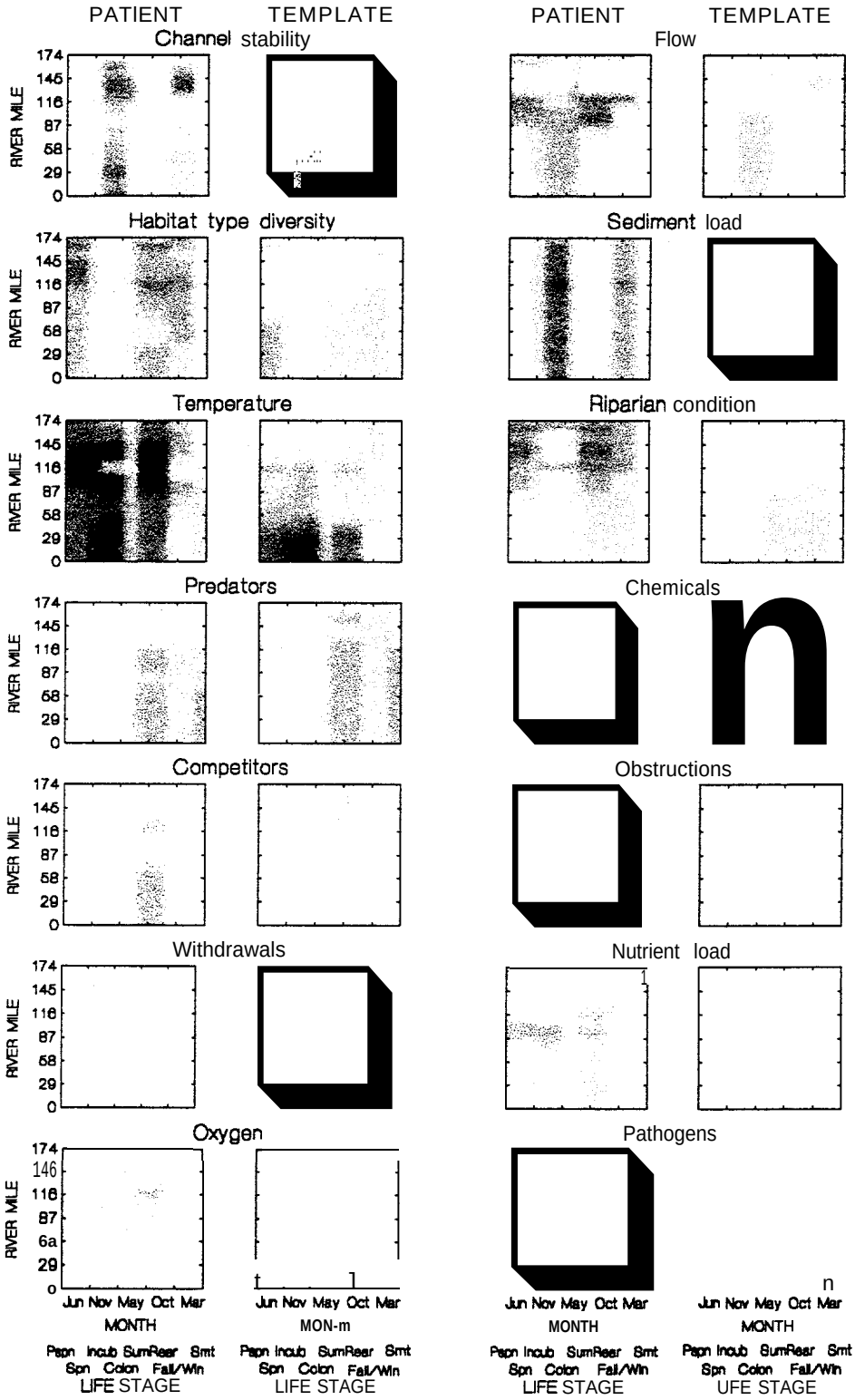


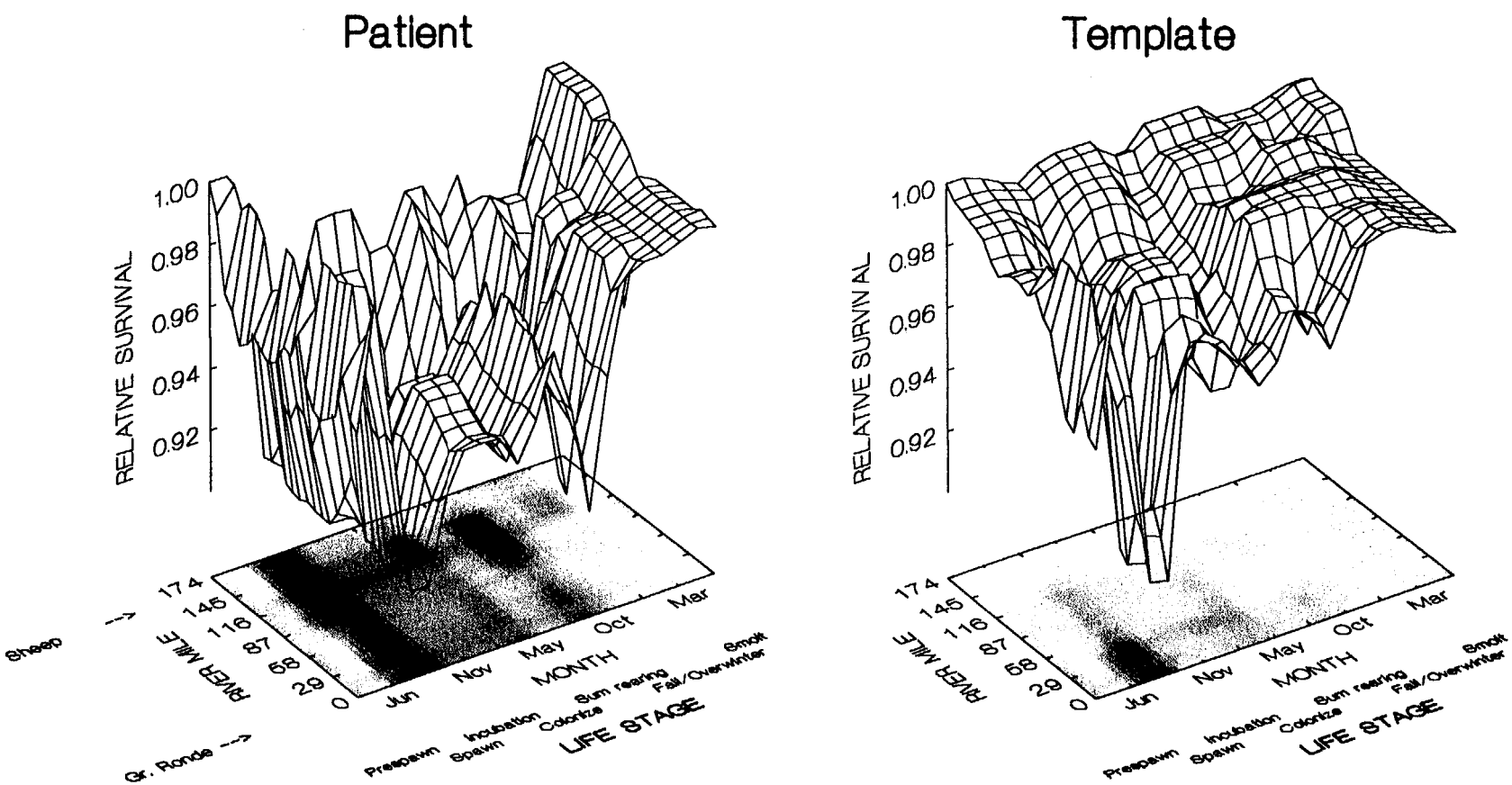
Sheep Cr/Grande Ronde Environmental Attributes



Level of Effect

- ❑ No effect
- ❑ Low
- ❑ Moderate
- ❑ High
- ■ Lethal

Sheep Cr/Grande Ronde ϑ Relative Survival



Stream Reach Range

Imnaha R

Patient-Template Analysis Summary

Stream Reach Range: Imnaha R.

Key Habitat Quantity

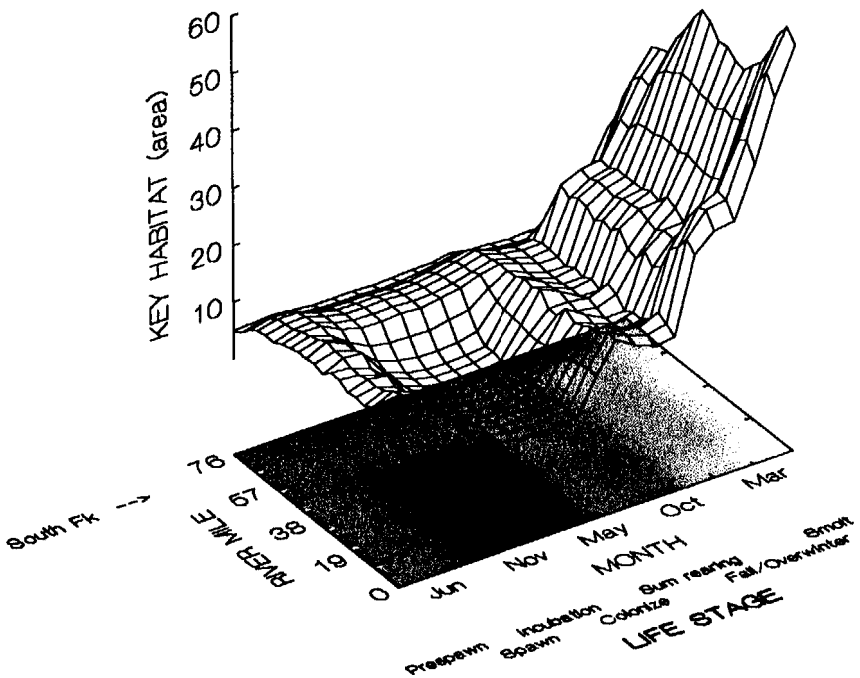
The extent of changes from historic levels in the quantity of key habitat for spring chinook in the Imnaha River differs by life stage and stream reach. The greatest reductions in key habitat have occurred through much of the mid portions and upper reaches of river (to about river mile 67) in the spawning and egg incubation stage. These losses are mainly associated with losses in gravels of a size suitable for spring chinook spawning. Causes of the loss are mainly due to removal of in-channel structure and some bank hardening.

Relative Productivity (Survival)

The capability of the mainstem Imnaha River and its South Fork of supporting spring chinook productivity (survival) is reduced for several life stages compared to historic conditions. This reduction has occurred mainly in the mid to lower reaches of the river in the prespawning, spawning, fry colonization, and summer rearing life stages. In these reaches, survival conditions have worsened due to slightly increased water temperatures, small loss in habitat diversity, and increased channel (streambed) instability.

Imnaha R Key Habitat Quantity

Patient



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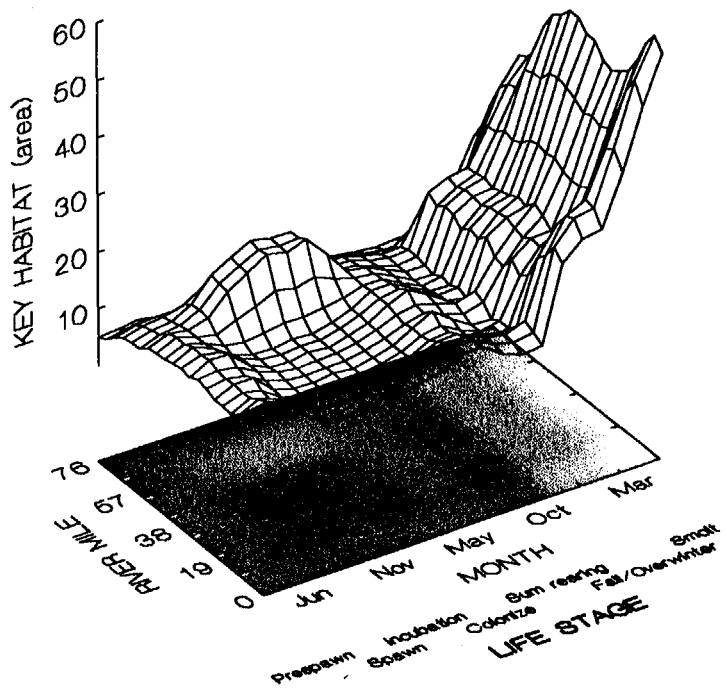
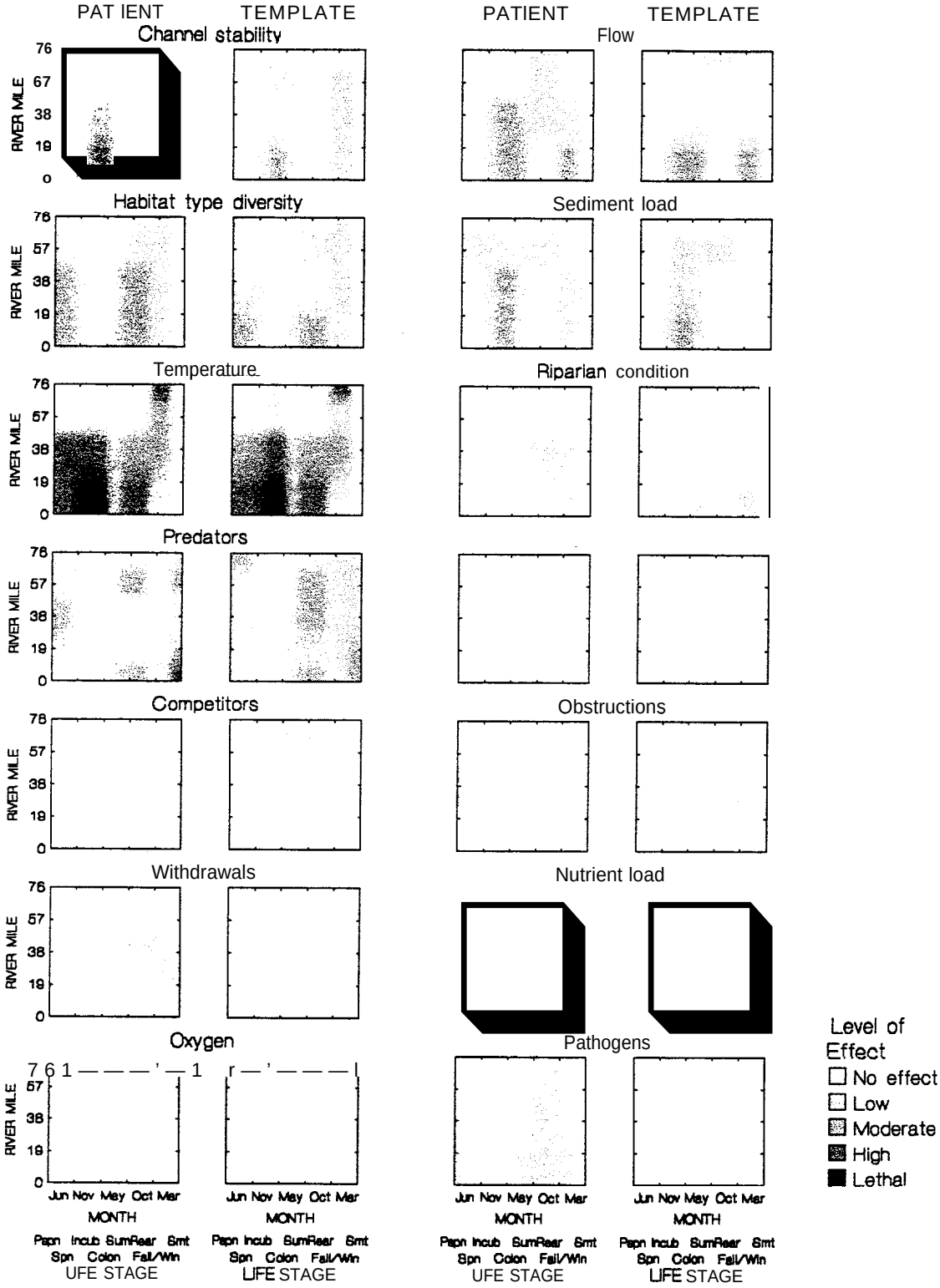
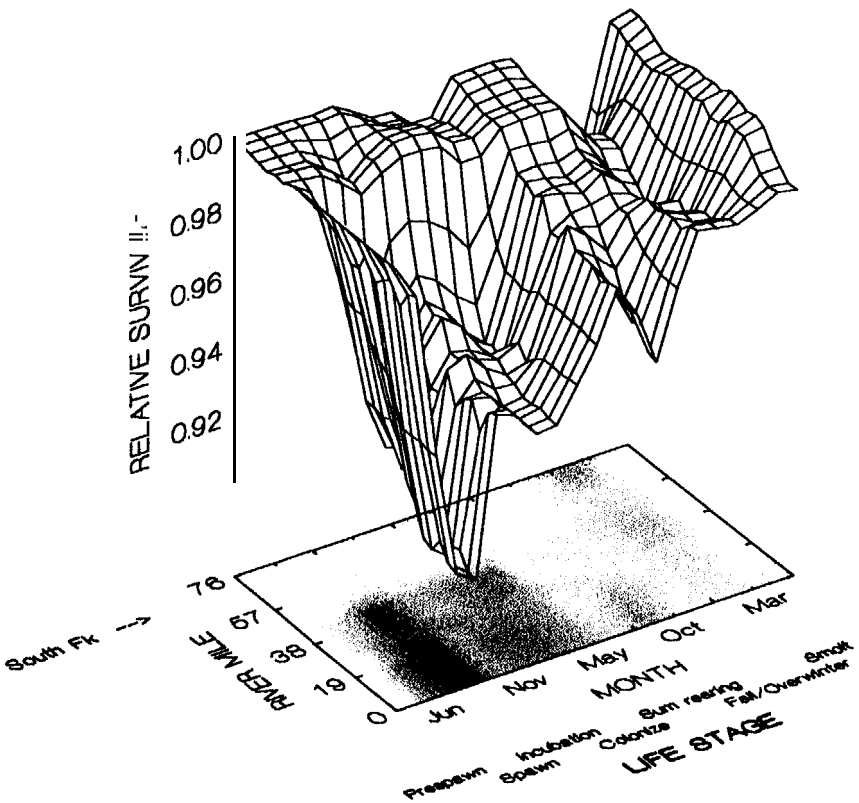


Imnaha R Environmental Attributes



mnaha R Relative Survival

Patient



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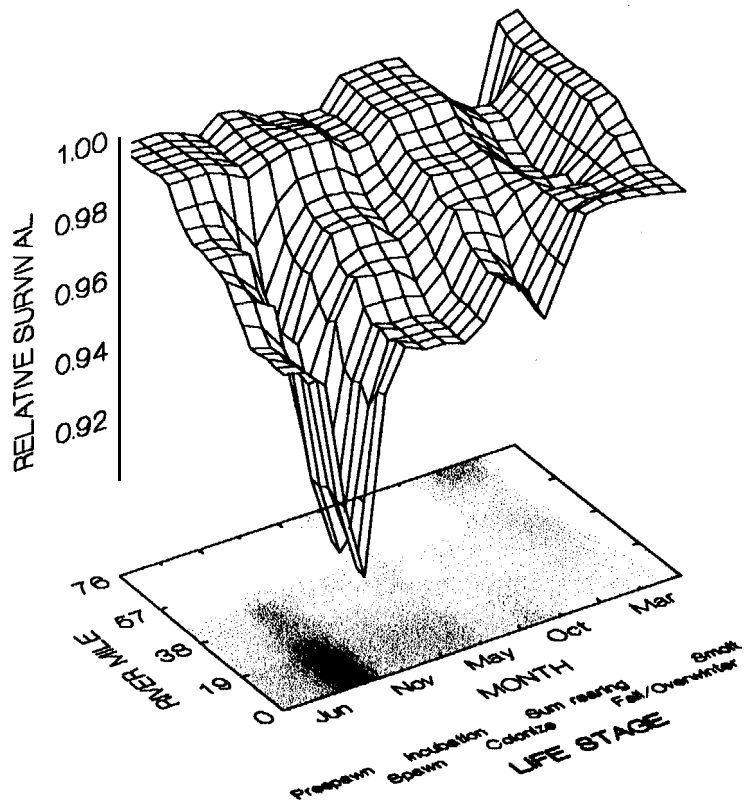


Stream Reach Range

Big Sheep Cr / Imnaha R

Patient-Template Analysis Summary

Stream Reach Range: Big Sheep Cr./Imnaha R.

Key Habitat Quantity

The extent of changes from historic levels in the quantity of key habitat for spring chinook in Big Sheep Creek differs by life stage and stream reach. Losses have been greatest in the upper half of Big Sheep Creek in the spawning, incubation, colonization, and summer rearing stages.

The quantity of key habitat in the Imnaha River downstream of Big Sheep Creek is comparatively small, although egg incubation habitat shows relatively substantial loss compared to historic levels.

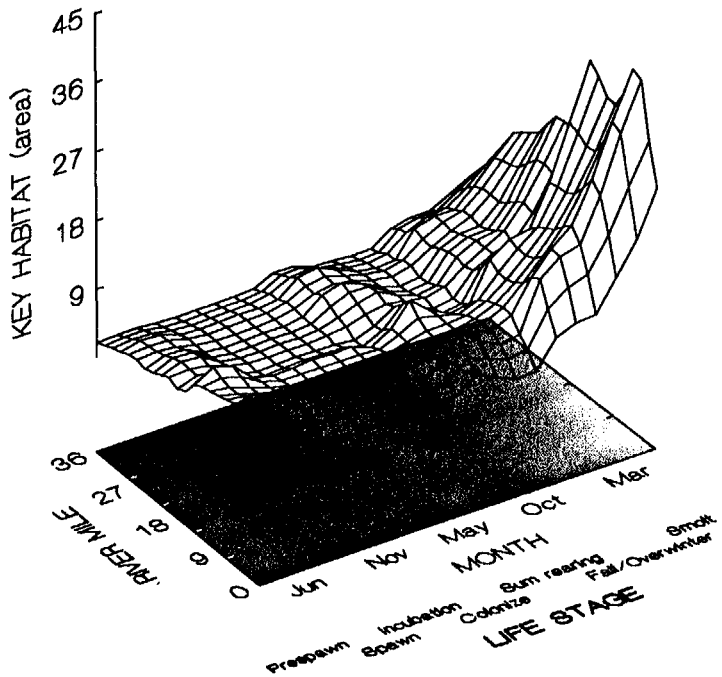
Relative Productivity (Survival)

The capability of the lower 23 miles of Big Sheep Creek of supporting spring chinook productivity (survival) is greatly reduced compared to historic conditions for most life stages. Survival conditions in this section have declined due primarily to changes in water temperature regimes, channel stability, habitat diversity, and, to a lesser extent, flow regimes and sediment load. Historically, survival conditions in the lower portion of this section were relatively poor in the prespawner, spawner, and egg incubation stages. Survival conditions in the upper ten miles of the stream, though slightly depressed compared to historic conditions, remain relatively good.

Survival conditions in the Imnaha River downstream of Big Sheep Creek have worsened compared to those that existed historically, although the lower portions of the river have always been unfavorable for survival during some life stages. Conditions are less favorable due to slightly increased water temperatures, small loss in habitat diversity, and increased channel (streambed) instability.

Big Sheep Cr Key Habitat Quantity

Patient



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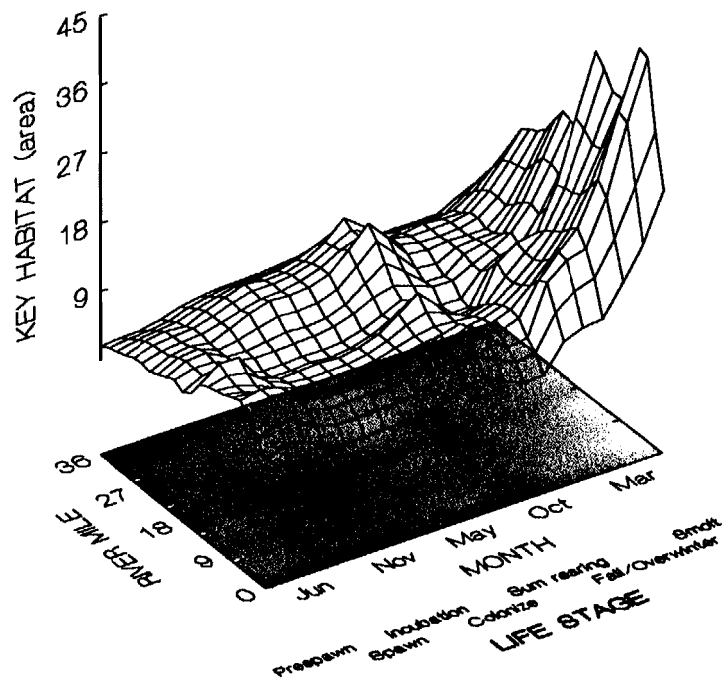
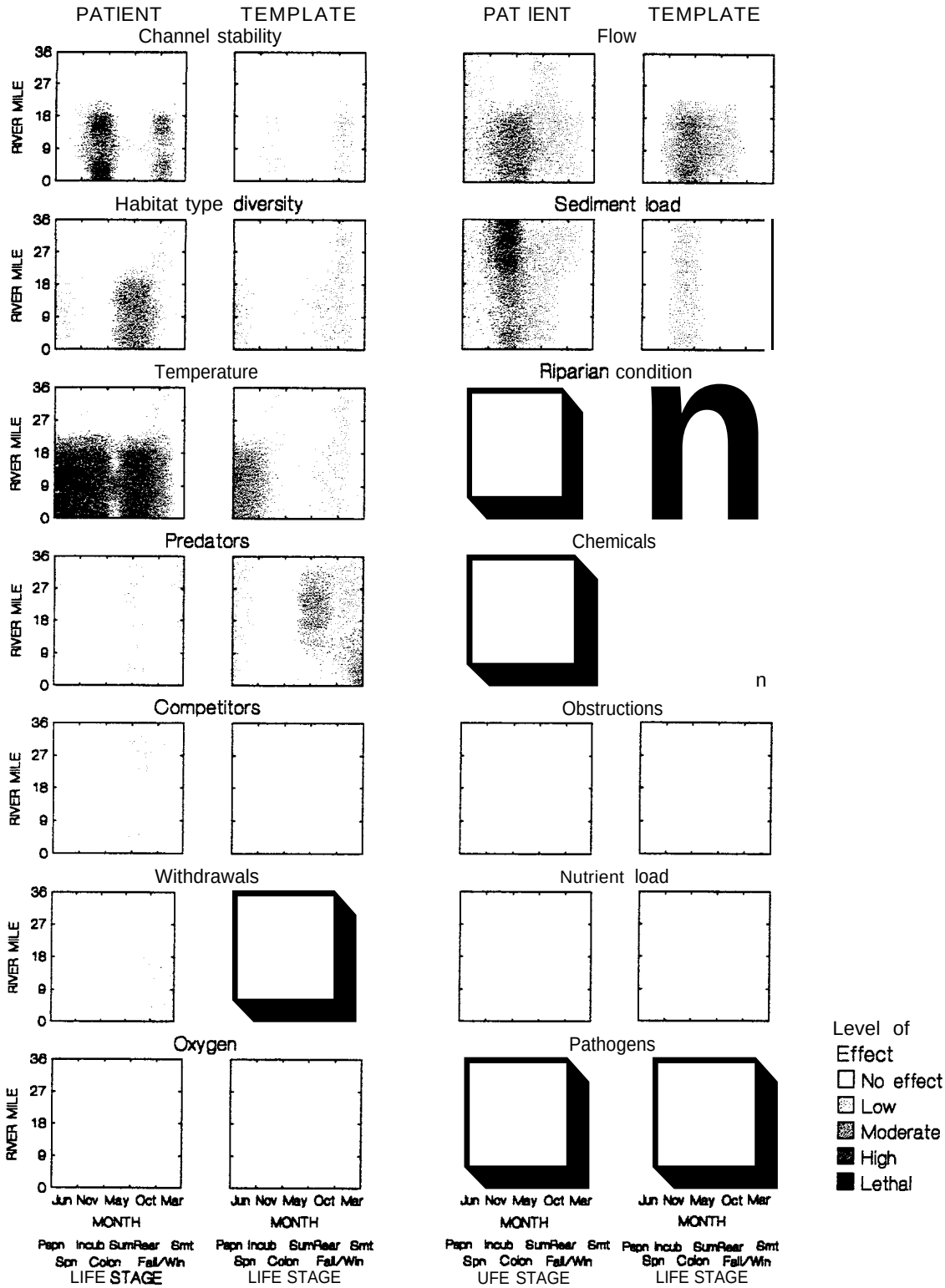
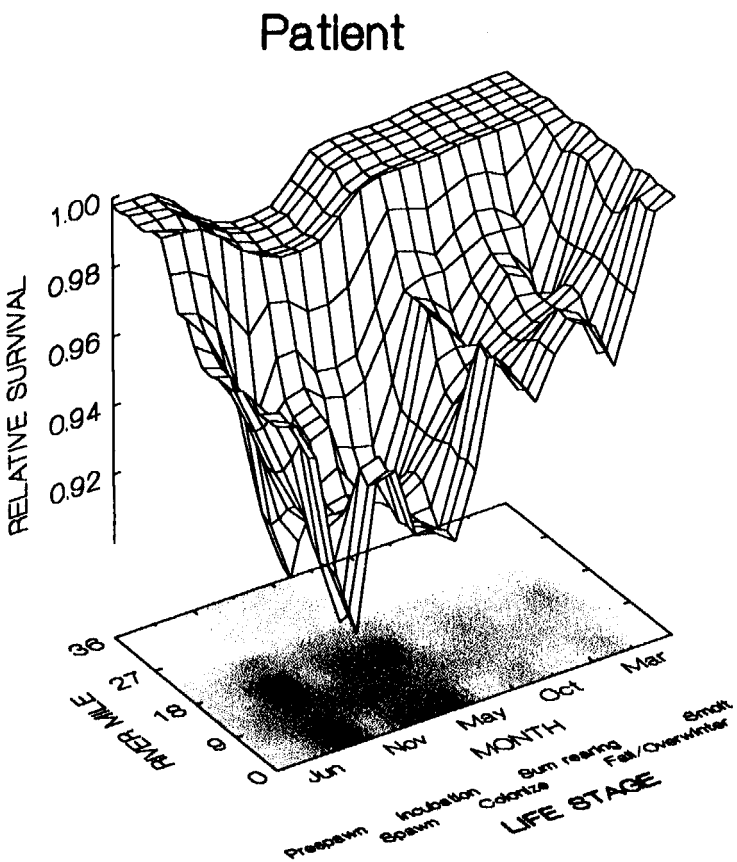
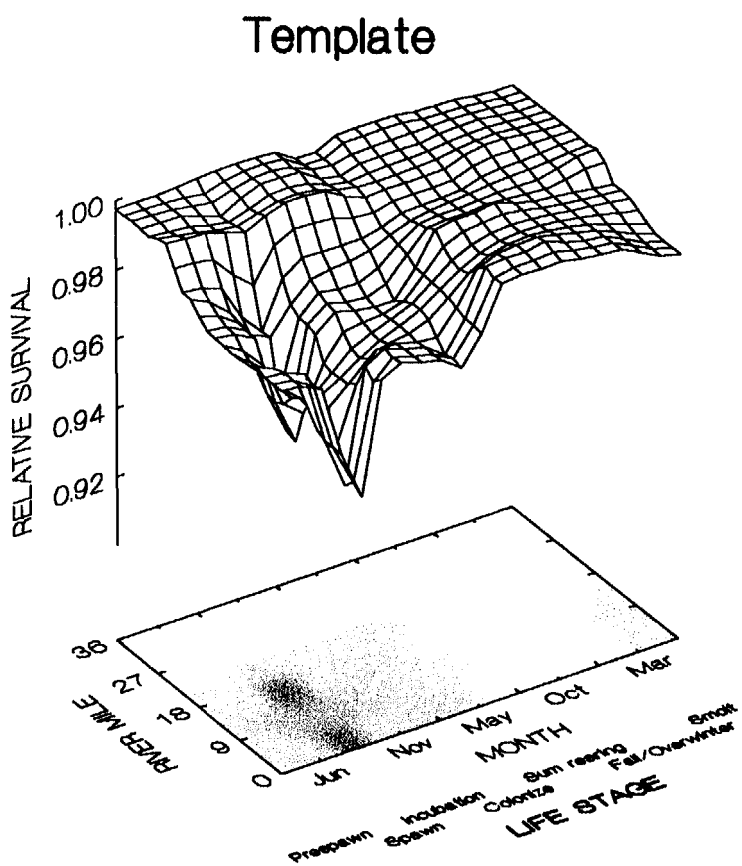


Big Sheep Cr Environmental Attributes



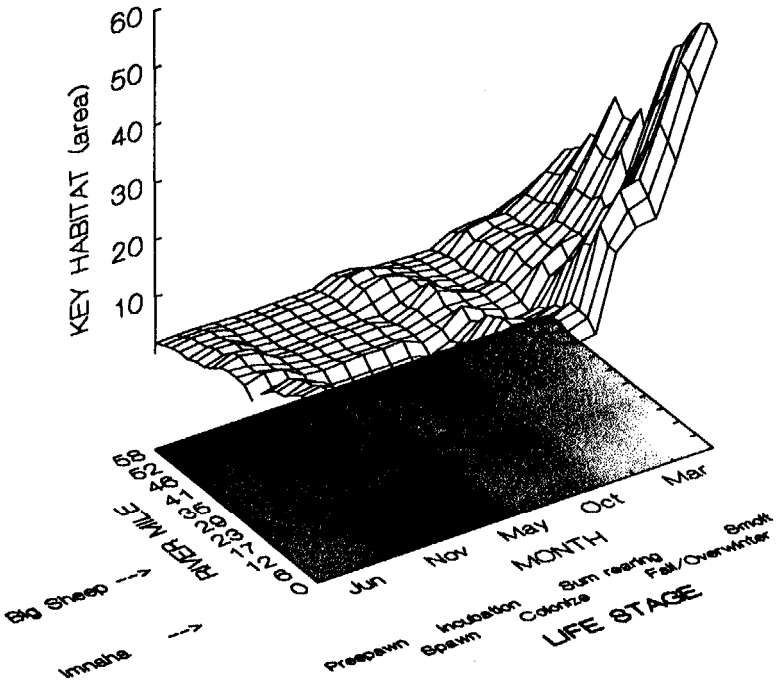
Big Sheep Cr Relative Survival





Big Sheep Cr/Imnaha R Key Habitat Quantity

Patient



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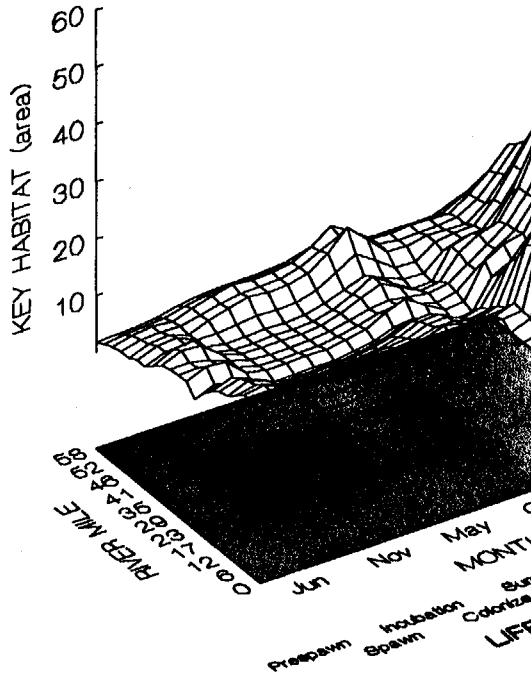
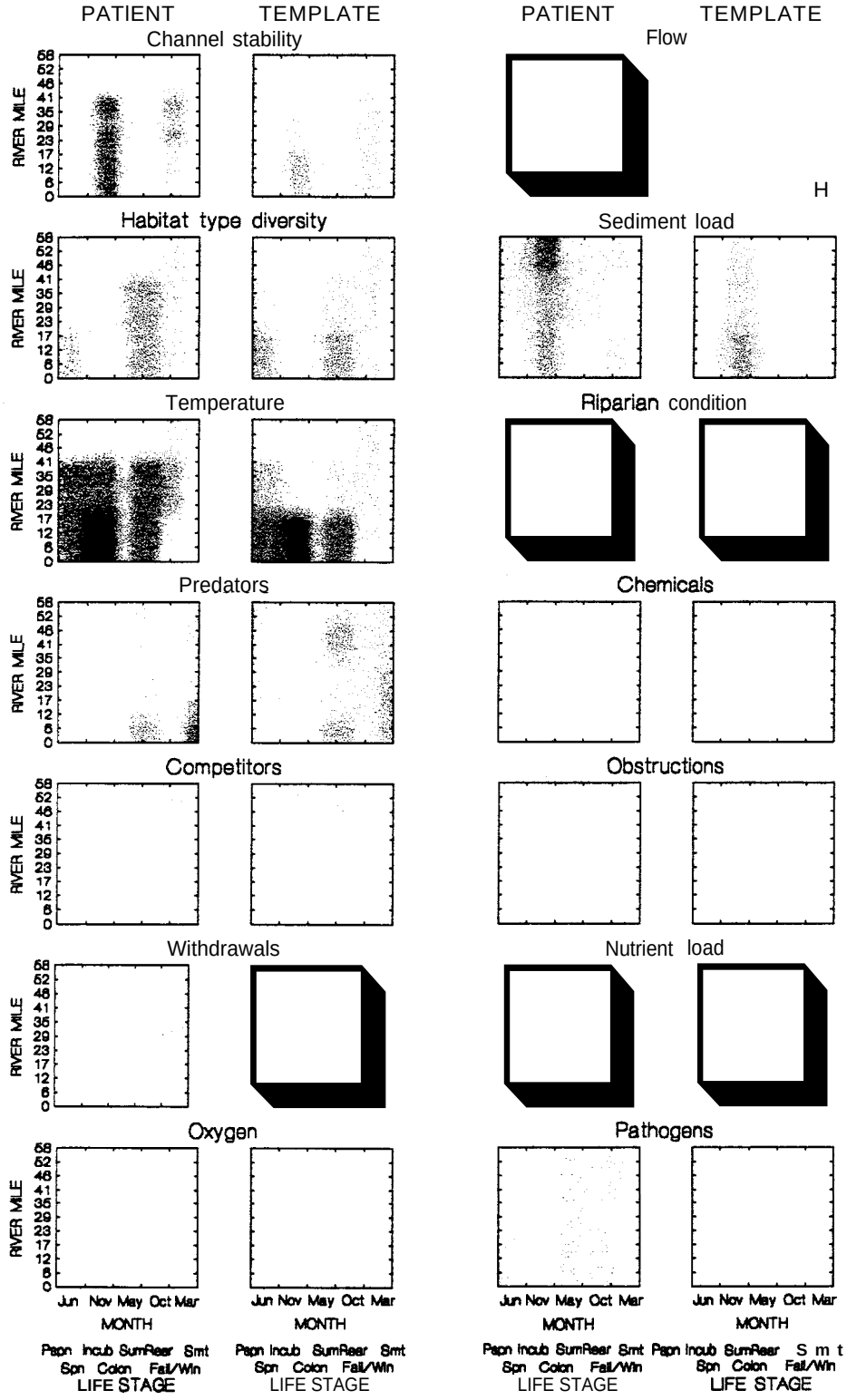


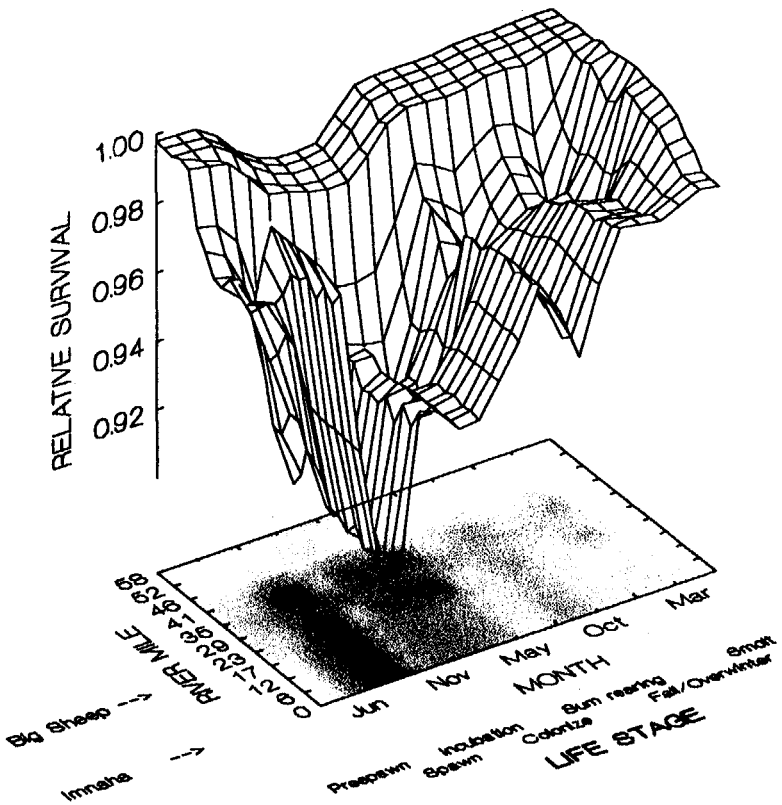
Big Sheep Cr/Imnaha R Environmental Attributes



Level of Effect
- ❑ No effect
- ❑ Low
- ❑ Moderate
- ❑ High
- ■ Lethal

Big Sheep Cr/Imnaha Relative Survival

Patient



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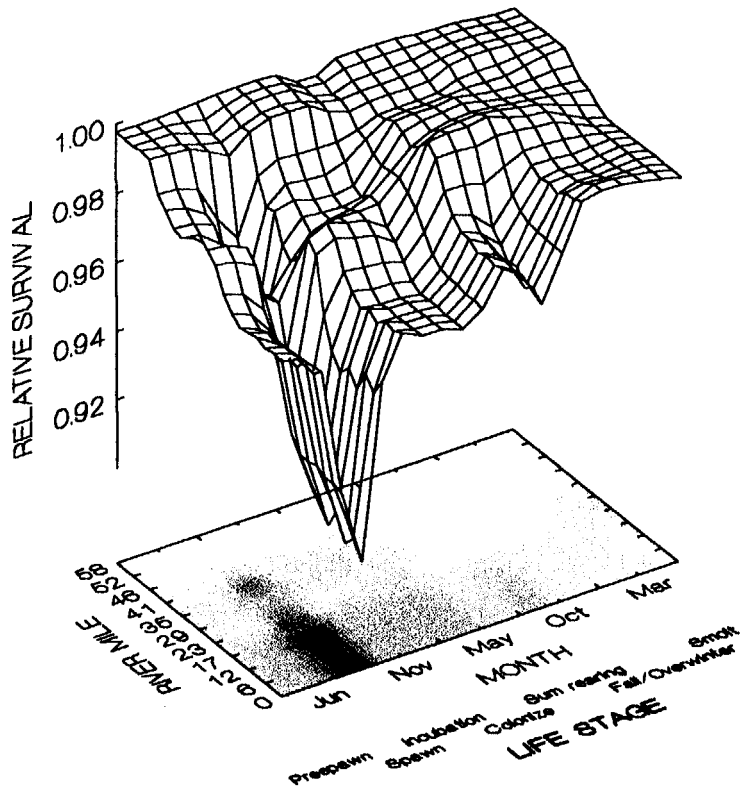


Stream Reach Range

Little Sheep Cr / Big Sheep Cr / Imnaha R

Patient-Template Analysis Summary

Stream Reach Range: Little Sheep Cr./Big Sheep Cr./Imnaha R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Little Sheep Creek is largely unchanged compared to historic levels, except in the prespawning stage which declined. The Little Sheep Creek system has always contained relatively little spring chinook key habitat.

The quantity of key habitat in the Imnaha River downstream of Big Sheep Creek is comparatively small, although egg incubation habitat shows relatively substantial 1oss compared to historic levels.

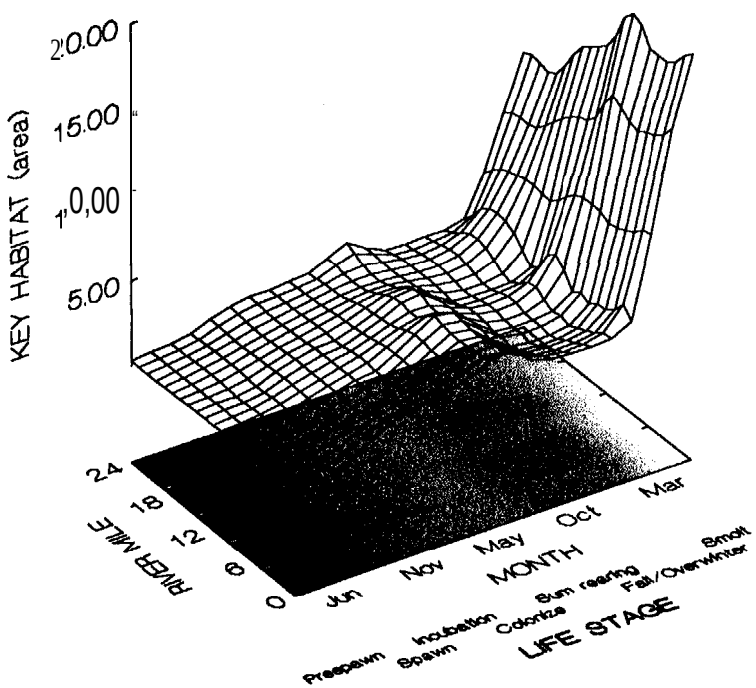
Relative Productivity (Survival)

The capability of Little Sheep Creek of supporting spring chinook productivity (survival) is greatly reduced compared to historic conditions for all life stages except smelt. Current survival conditions are generally poor due primarily to changes in flow regimes, channel (streambed) stability, sediment load, and habitat diversity. Historically, survival conditions in this stream were excellent for all life stages.

Survival conditions in the Imnaha River downstream of Little Sheep Creek have worsened compared to those that existed historically, although the lower portions of the river have always been unfavorable for survival during some life stages. Conditions are less favorable due to slightly increased water temperatures, small loss in habitat diversity, and increased channel (streambed) instability.

Little Sheep Cr Key Habitat Quantity

Patient



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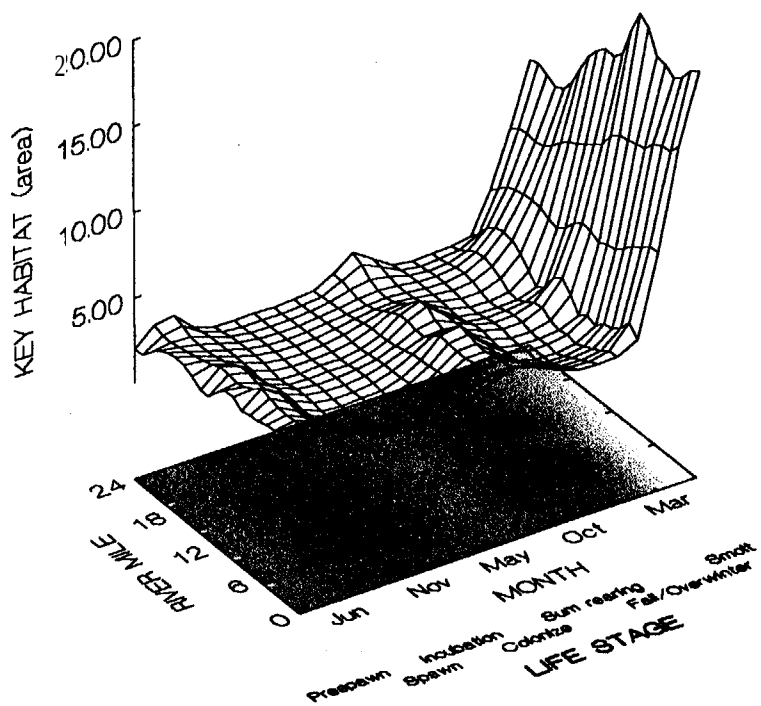
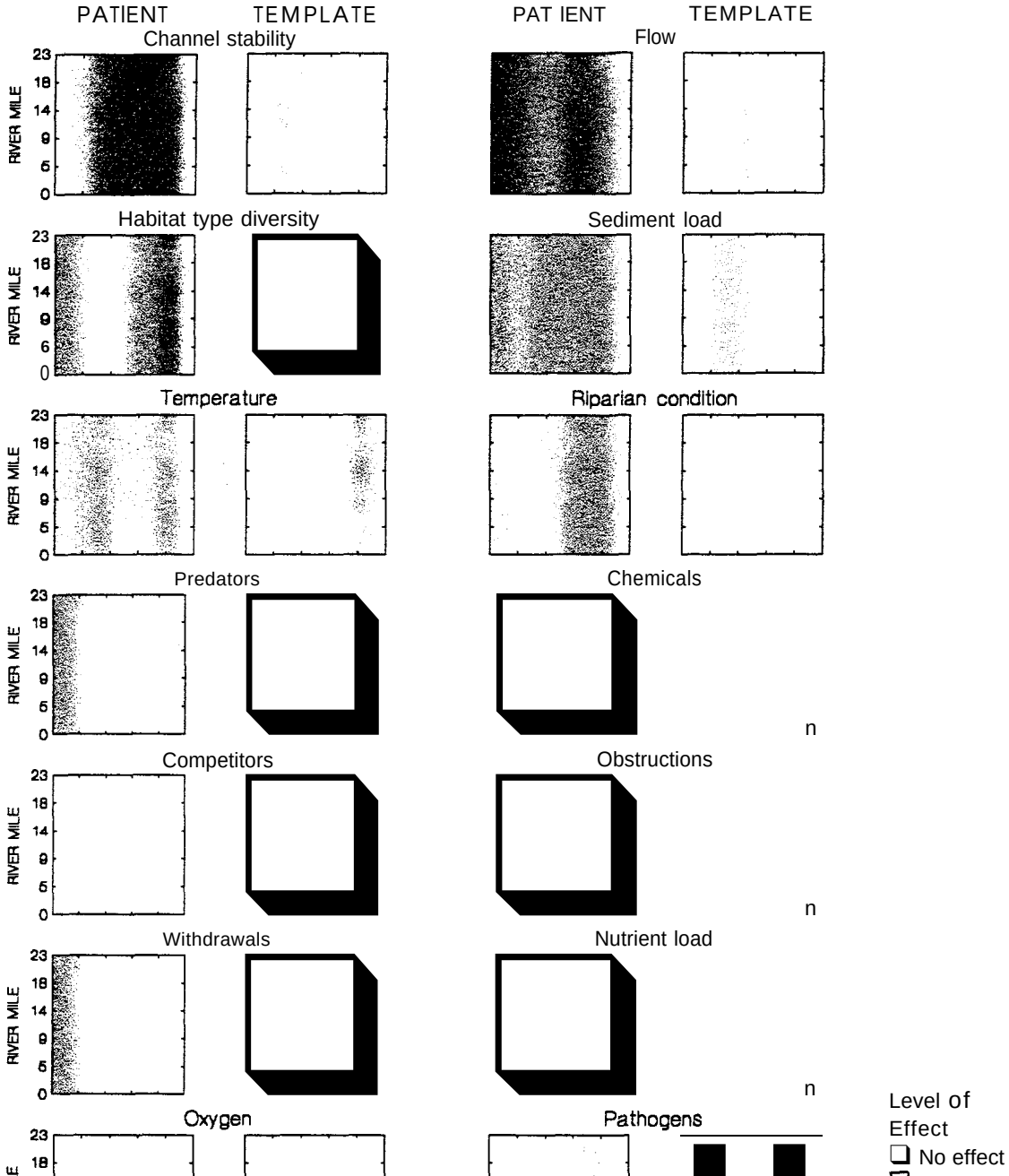
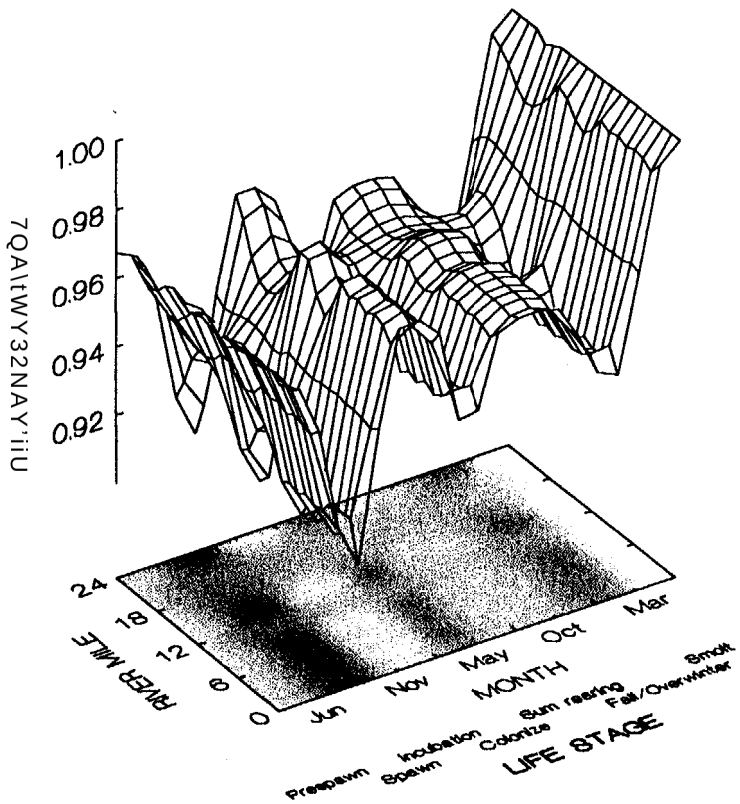


Little Sheep Cr Environmental Attributes



Little Sheep Cr Relat Surviva

Patient



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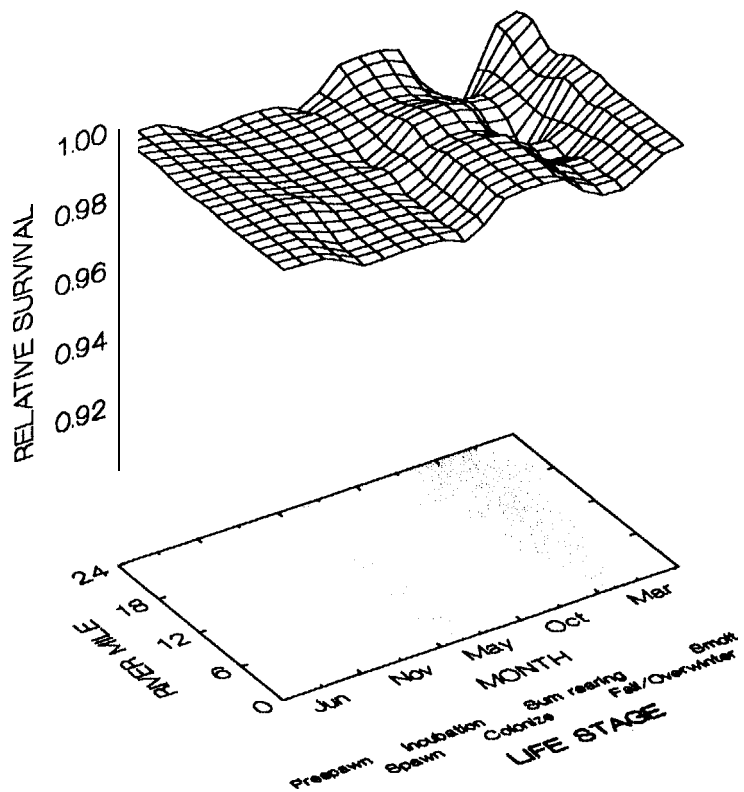
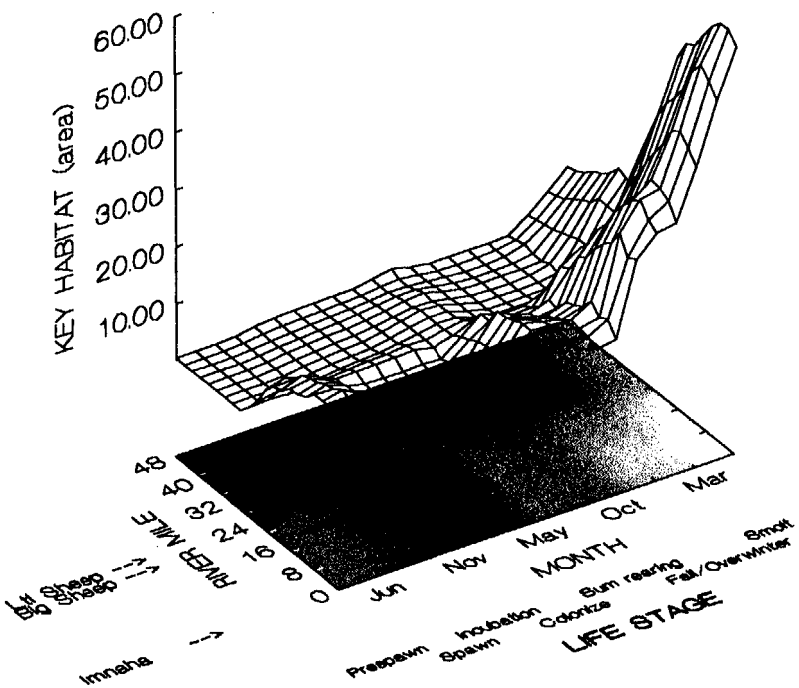


Little Sheep Cr/Big Sheep Cr/Imnaha Key Habitat Quantity

Patient



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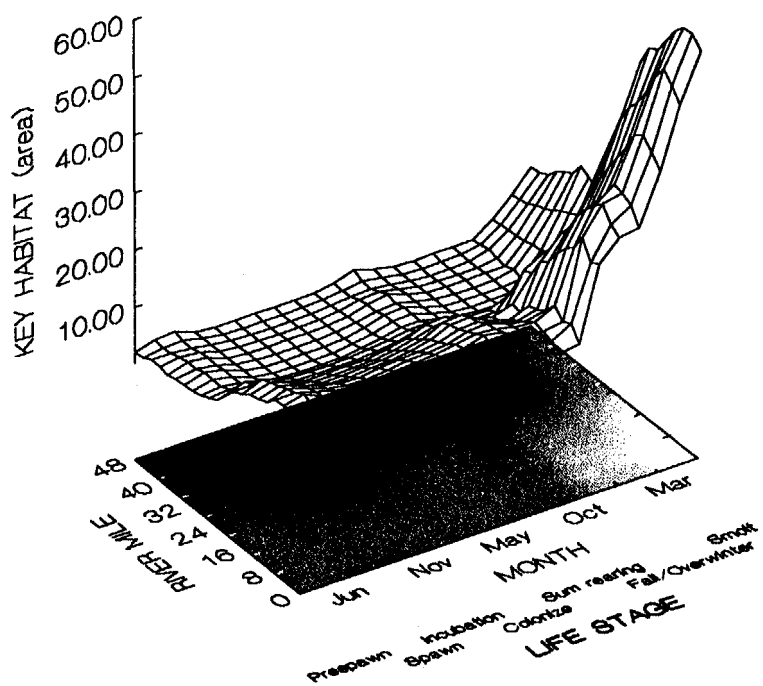
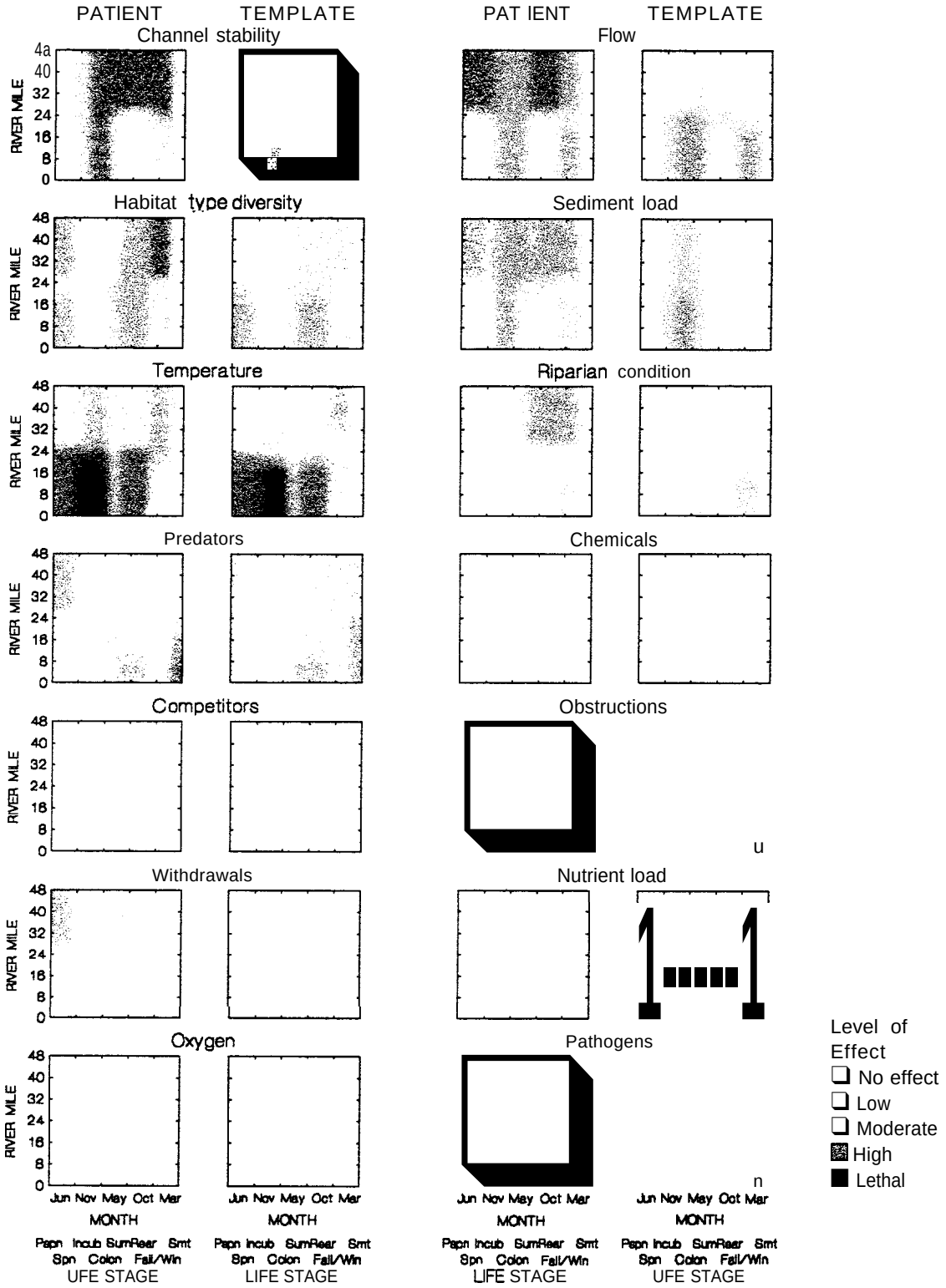
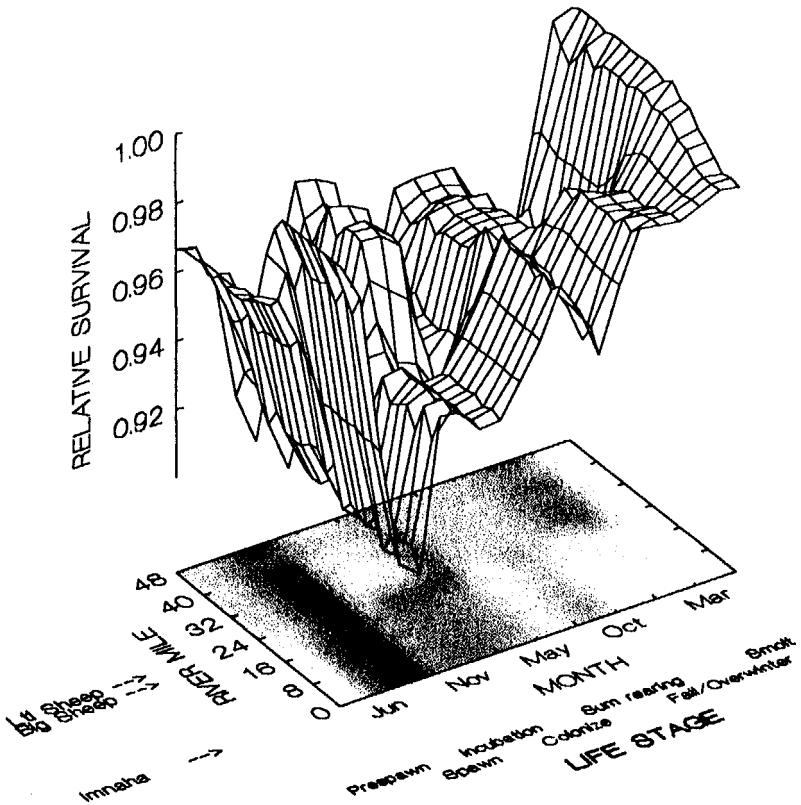


Little Sheep Cr/Big Sheep Cr/Imnaha R
Environmental Attributes



Little Sheep Cr/Big Sheep Cr/Imnaha R Relative Survival

Patient



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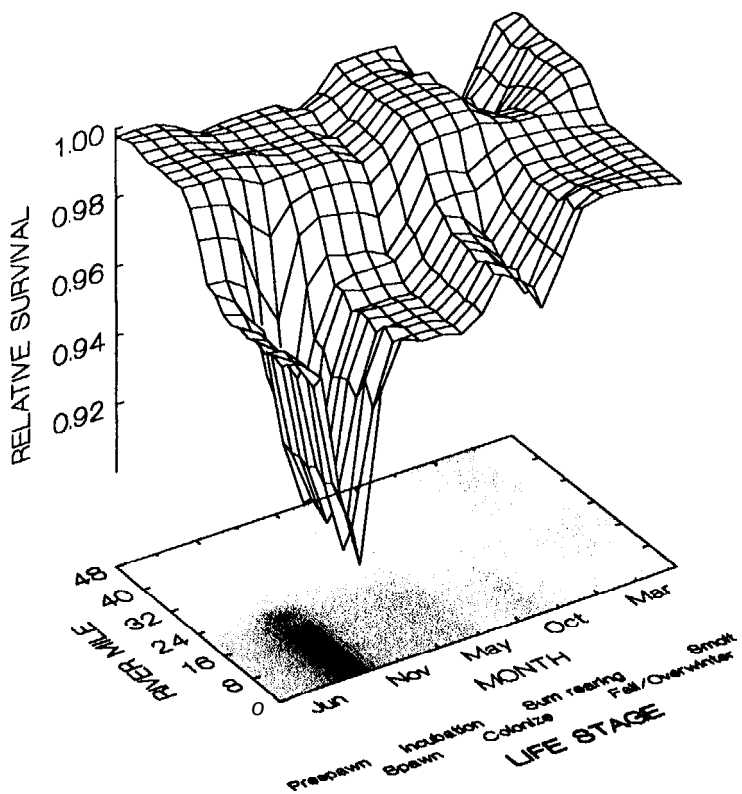


Stream Reach Range

Lightning Cr / Imnaha R

Patient-Template Analysis Summary

Stream Reach Range: Lightning Cr./Imnaha R.

Key Habitat Quantity

The quantity of key habitat for spring chinook in Lightning Creek is unchanged compared to historic levels. This stream has always contained little spring chinook key habitat.

The quantity of key habitat in the Imnaha River downstream of Lightning Creek is comparatively small, although egg incubation habitat shows relatively substantial loss compared to historic levels.

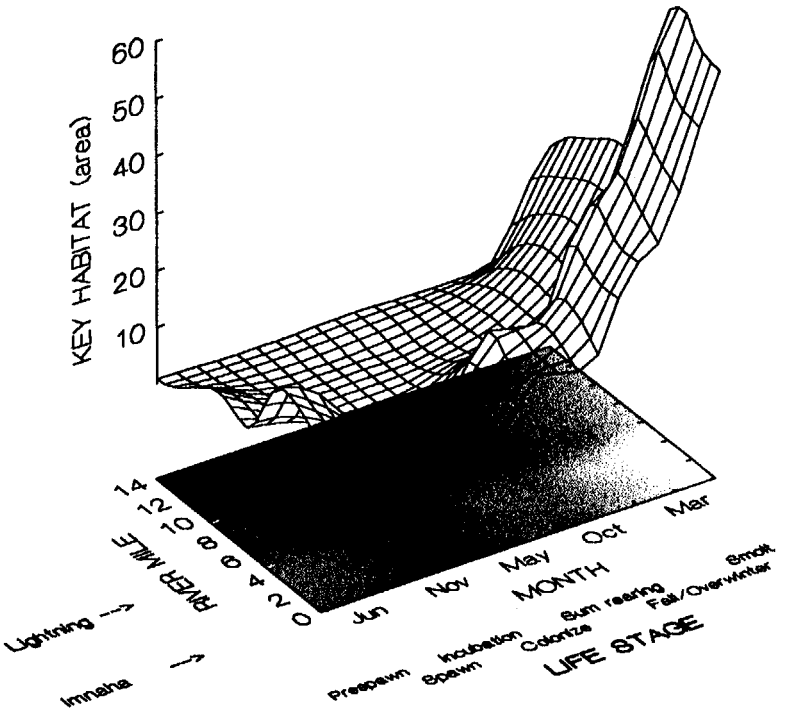
Relative Productivity (Survival)

The capability of Lightning Creek of supporting spring chinook productivity (survival) is essentially unchanged compared to historic conditions. In general, survival conditions are relatively poor for prespawners, spawners, and egg incubation but are good for summer rearing and overwintering.

Survival conditions in the Imnaha River downstream of Lightning have worsened slightly compared to those that existed historical y, although the lower portions of the river have always been unfavorable for survival during some life stages. Conditions are less favorable due to slightly increased water temperatures, small loss in habitat diversity, and increased channel (streambed) instability.

Lightning Cr/Imnaha & Key Habitat Quantity

Patient



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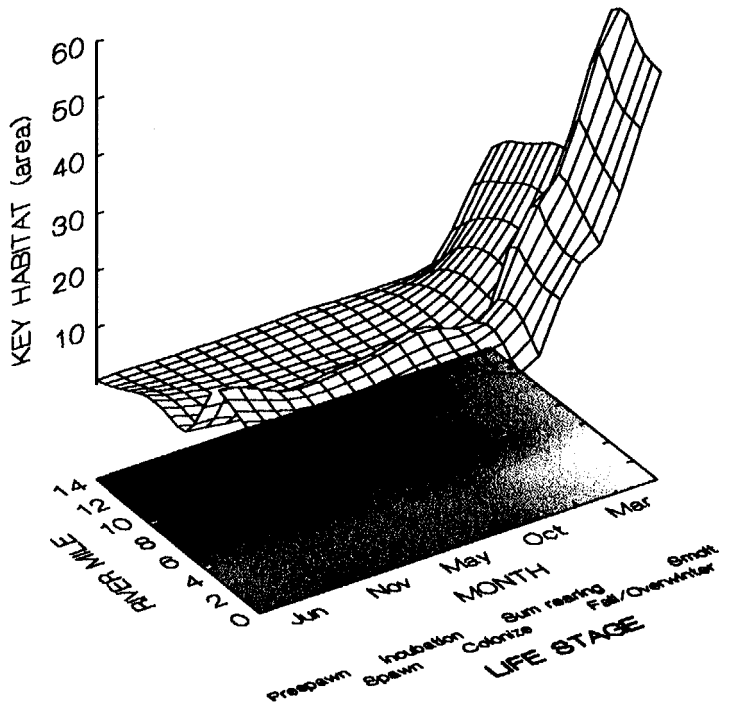
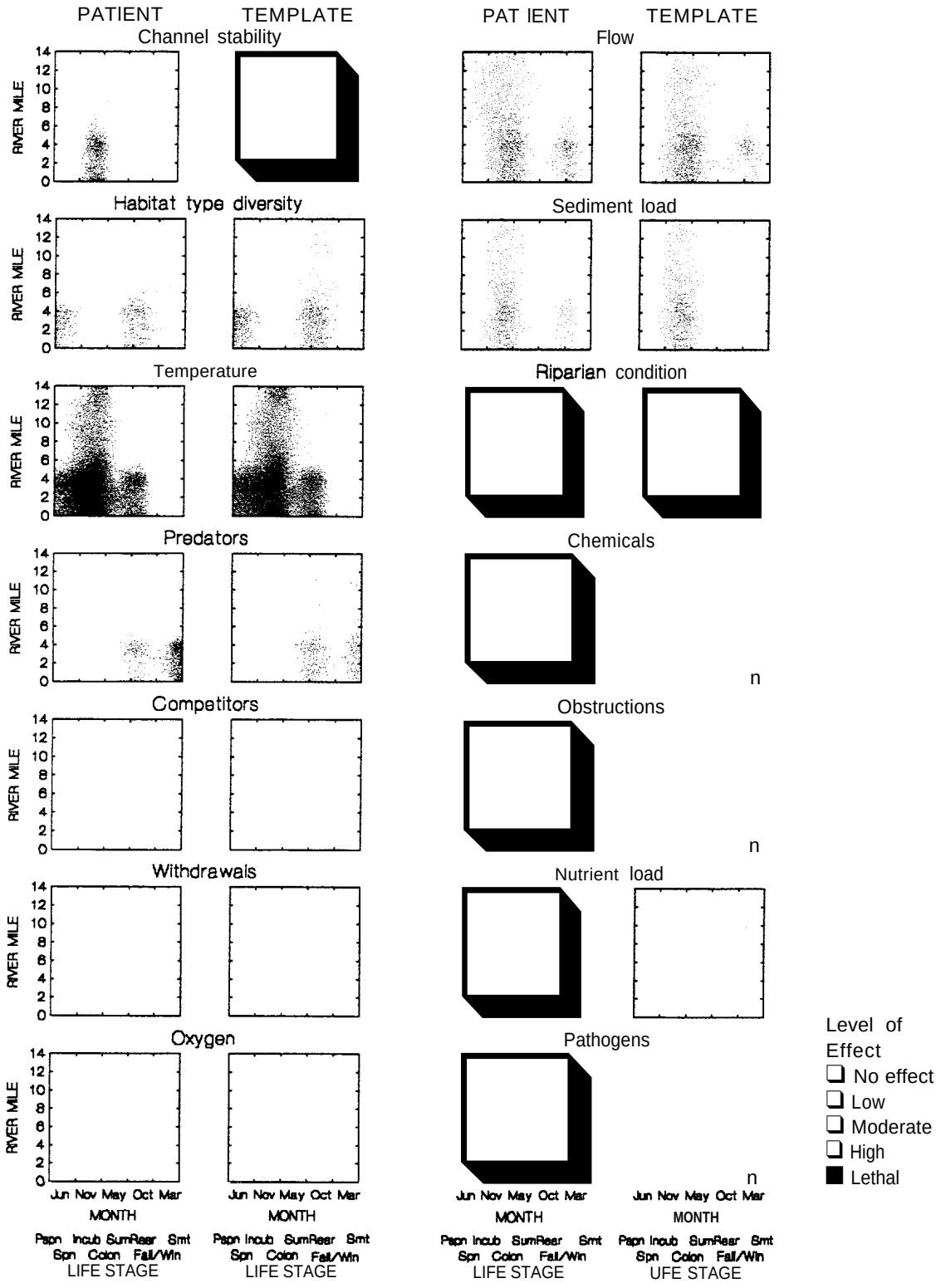
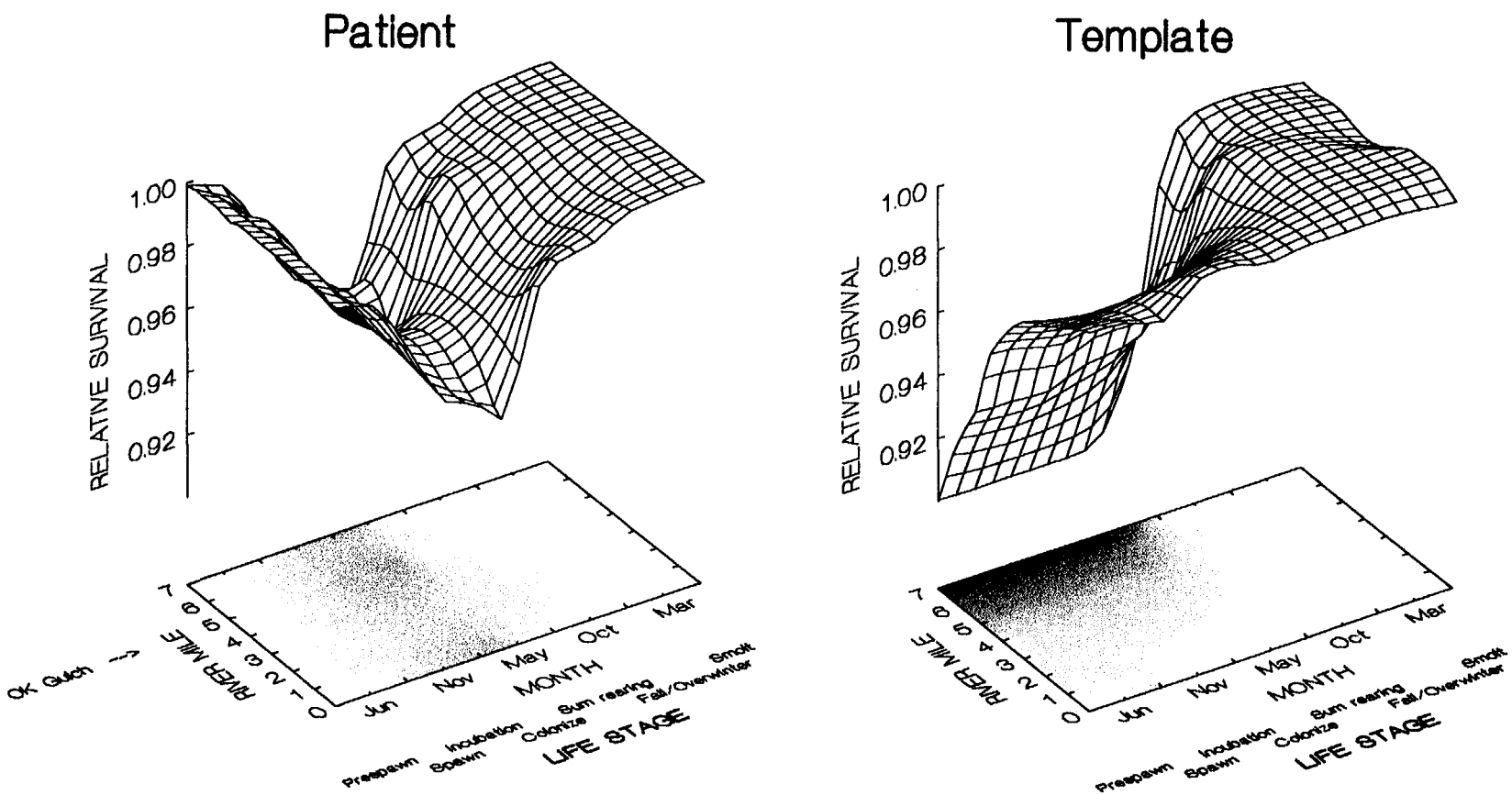


Lightning Cr/Imnaha R Environmental Attributes



OK Gulch/Prairie Cr Relative Survival



APPENDIX D

Grande Ronde Stream **Reach** Summaries
for **Primary and Secondary** Life History Pathways

Reaches analyzed in the Grande Ronde, listed in the order they appear in Appendix 1T.

Stream	Reach	Benefit Category for Primary & Secondary Life Histones
Bear Cr.	Mouth - Chamberlain Ditch (RM 101.8 -104.7 from Snake R)	F
Bear Cr.	Chamberlain Ditch - Little Bear Cr (RM 104.7 -109.3 from Snake R)	E
Bear Cr.	Little Bear Cr - headwaters (RM 109.3 -118.3 from Snake R)	E
Catherine Cr.	Mouth - 10th Street Bridge in Union (RM 114.5 -146.0 from Snake R)	F
Catherine Cr.	10th Street Bridge in Union - Little Catherine Cr (RM 146.0 -157.5 from Snake R)	A
Catherine Cr.	Little Catherine Cr - forks (RM 157.5 -164.4 from Snake R)	D
Catherine Cr.	South Fork Catherine Cr (RM 164.4 -166.8 from Snake R)	B
Grande Ronde R.	Mouth - Joseph Cr (RM 0.0- 3.7 from Snake R)	B
Grande Ronde R.	Joseph Cr - Buford Cr (RM 3.7- 26.2 from Snake R)	F
Grande Ronde R.	Buford Cr - Bear Cr (RM 26.2 -28.2 from Snake R)	E
Grande Ronde R.	Bear Cr - Menatchee Cr (RM 28.2 -34.8 from Snake R)	F
Grande Ronde R.	Menatchee Cr - Wenaha R (RM 34.8 -45.1 from Snake R)	F
Grande Ronde R.	Wenaha R - Courtney Cr (RM 45.1 -46.2 from Snake R)	F
Grande Ronde R.	Courtney Cr - Mud Cr(RM 46.2-51.4 from Snake R)	F
Grande Ronde R.	Mud Cr - Wallupa/Wildcat Cr (RM 51.4 -52.8 from Snake R)	F
Grande Ronde R.	Wallupa/Wildcat Cr - Grossman Cr (RM 52.8-6 [. 1 from Snake R)	F
Grande Ronde R.	Grossman Cr -WaIlowaR(RM61. 1 -80.0 from Snake R)	B
Grande Ronde R.	Wallowa R - Lookingglass Cr (RM 80.0 -83.4 from Snake R)	A
Grande Ronde R.	Lookingglass Cr - Gordon Cr (RM 83.4 -94.2 from Snake R)	F
Grande Ronde R.	Gordon Cr - Phillips Cr (RM 94.2 -96.9 from Snake R)	F
Grande Ronde R.	Phillips Cr - Clark Cr (RM 96.9 -97.3 from Snake R)	F
Grande Ronde R.	Clark Cr - Indian Cr (RM 97.3 -99.3 from Snake R)	F
Grande Ronde R.	Indian Cr - Willow Cr (RM 99.3 -103.5 from Snake R)	F
Grande Ronde R.	Willow Cr - downstream end of State Ditch (RM 103.5 -114.5 from Snake R)	F
Grande Ronde R.	Downs[ream end of State Ditch - Upstream end of State Ditch (RM 114.5 -118.9 from Snake	F
Grande Ronde R.	Upstream end of State Ditch - I-84 crossing below Devil's Slide (RM 118.9 -128.4 from Snak	D
Grande Ronde R.	I-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 -133.4 from Snake R)	D
Grande Ronde R.	Five Points Cr - Rock Cr (RM 133.4 -133.8 from Snake R)	F
Grande Ronde R.	Rock Cr - Whiskey Cr (RM 133.8 -136.6 from Snake R)	F
Grande Ronde R.	Whiskey Cr - Jordan Cr (RM 136.6-139. I from Snake R)	F
Grande Ronde R.	Jordan Cr - Beaver Cr (RM 139.1 -145.8 from Snake R)	F
Grande Ronde R.	Beaver Cr - Meadow Cr (RM 145.8 -147.0 from Snake R)	A
Grande Ronde R.	Meadow Cr - Fly Cr (RM 147.0-15 [.3 from Snake R)	A
Grande Ronde R.	Fly Cr - head of canyon 1.3 miles downstream of Sheep Cr (RM 151.3 -159.4 from Snake R)	A
Grande Ronde R.	Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 -164.2 from S	A
Grande Ronde R.	LimberJim Cr - Clear Cr (RM 164.2 -166.9 from Snake R)	A
Grande Ronde R.	Clear Cr - headwaters (RM 166.9- [70.1 from Snake R)	B
Hurricane Cr.	Mouth - Lower AlderSlope Ditch (RM 121.9 -124.9 from Snake R)	B
Hurricane Cr.	Lower Alderslope Ditch - Upper Alderslope Ditch Diversion (RM 124.9 -128.2 from Snake F	A
Joseph Cr.	Mouth - Cottonwood Cr (RM 3.7- 8.2 from Snake R)	E
Joseph Cr.	Cottonwood Cr - Swamp Cr (RM 8.2- 37.7 from Snake R)	F
Joseph Cr.	Swamp Cr - Chesnimnus Cr (RM 37.7 -52.7 from Snake R)	F
Chesnimnus Cr.	Confluence with Crow Cr - South Fork (RM 52.7 -77.7 from Snake R)	F
Lookingglass Cr.	Mouth - Little Lookingglass Cr (RM 83.4 -87.6 from Snake R)	B
Lookingglass Cr.	Little Lookingglass Cr - headwaters (RM 87.6 -93.8 from Snake R)	E

Reaches analyzed in the Grande Ronde, listed in the order they appear in Appendix D.

Stream	Reach	Benefit Category for Primary & Secondary Life Histories
Lostine R.	Mouth - ClearWater Ditch (RM 105.8 -108.3 from Snake R)	**F**
Lostine R.	ClearWater Ditch - Cross Country Ditch (RN1 108.3 -110.8 from Snake R)	**A**
Lostine R.	Cross Country Ditch - Sheep Ridge Dam (RM 110.8 -115.0 from Snake R)	D
Lostine R.	Sheep Ridge Dam - Silver Cr (RM 115.0 -120.0 from Snake R)	E
Lostine R.	Silver *Cr* - Lake Cr (RM 120.0 -124.6 from Snake R)	E
Lostine R.	Lake Cr - East Lostine R (RM 124.6 -131.7 from Snake R)	E
Miriam R.	Mouth - Cougar Cr (RM 89.8 -99.4 from Snake R)	F
Miriam R.	Cougar Cr - Little Miriam R(RA499.4 -108.4 from Snake R)	B
Miriam R.	Little Miriam R - splash dam site (1 m above Garwood Cr; RM 108.4 -119.7 from Snake R)	E
Minam R.	Splash dam site - falls (RM 119.7 -138.0 from Snake R)	E
Prairie Cr.	Mouth - OK Gulch confluence (RM 126.8 -131.8 from Snake R)	A
Prairie Cr.	OK Gulch fork (RM 131.8 -133.8 from Snake R)	E
Sheep Cr.	Mouth - Chicken Cr (RM 164.2 -165.7 from Snake R)	F
Sheep Cr.	Chicken Cr - headwaters (RM 165.7 -173.7 from Snake R)	F
Wallowa R.	Mouth - Miriam R (RM 80.0 -89.8 from Snake R)	F
Wallowa R.	Miriam R - Deer Cr (RM 89.8 -90.8 from Snake R)	F
Wallowa R.	Deer Cr - Dry Cr (RM 90.8 -98.3 from Snake R)	D
Wallowa R.	Dry Cr - Bear Cr (RM 98.3 -101.8 from Snake R)	D
Wallowa R.	Bear Cr - Whiskey Cr (RM 101.8 -103.9 from Snake R)	F
Wallowa R.	Whiskey Cr - Lostine R (RM 103.9 -105.8 from Snake R)	F
Wallowa R.	Lostine R - Parsnip Cr (RM 105.8 -109.0 from Snake R)	D
Wallowa R.	Parsnip Cr - Hurricane Cr (RM 109.0 -121.9 from Snake R)	A
Wallowa R.	Hurricane Cr - Lower Alderslope Ditch (RM 121.9 -126.8 from Snake R)	A
Wallowa R.	Lower Alderslope Ditch - Wallowa Lake (RM 126.8 -130.8 from Snake R)	F
Wenaha R.	Mouth - Crooked Cr (RM 45.1 -51.8 from Snake R)	F
Wenaha R.	Crooked Cr -Fairview Cr(RM 51.8 -55.3 from Snake R)	E
Wenaha R.	Fairview Cr - forks (RM 55.3 -65.9 from Snake R)	E
Wenaha R.	South Fork Wenaha R (RM 65.9 -72.4 from Snake R)	E

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Bear Cr.

Reach: Mouth - Chamberlain Ditch (RM 101.8 -104,7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	16.3	Habitat productivity loss score:	-8.7

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	2	2	0	0	0	14	14	0	0	0	1.3	-23.9	1.1
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	0	0	0	0	0	8	8	0	0	0	2.0	-83.8	-4.0
5	May-Oct	0	0	0	0	0	6	6	0	0	0	0.0	-19.4	-6.2
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	2	2	0	0	0	0	0	0	0	0	13.8	-2.4	0.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	28.7	HABD	21.5	TEMP	14.3	WITH	14.3				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	FLOW	62,5	TEMP	25.0	WITH	25.0	CSTAB	12.5	HABD	12.5	PATHO	12.5
5	May-Ott	FLOW	19.4	HABD	9.7	PRED	9.7	WITH	9.7	PATHO	4.9		
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun												

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Bear Cr.
Reach: Chamberlain Ditch - Little Bear Cr (RM 104.7 -109.3 from Snake R)

Restoration benefit category:	E	Chinook usage score:	586,4	Habitat productivity loss score:	-67,2

Life stage	Montha	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	7	7	0	0	0	49	49	0	0	o	5.4	7.8	0.0
1 2,3	Aug-Ott	10	10	0	0	0	70	70	0	0	0	2.7	-27.0	40.9
3	Ott-Mar	20	20	0	0	0	140	140	0	0	0	0.7	-63.2	0.0
3,4	Mar-May	8	8	0	0	0	36	36	0	0	0	3.8	-23.8	-7.0
5	May-Ott	25	25	o	0	0	72	72	0	0	0	5.1	8.6	-75.6
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	4.1	0.9	-257
7	Mar-Jun	2	2	0	0	0	0	0	0	0	0	17.9	5.1	0.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Aft 5	% change	Att 6	% change
1	Apr-Aug	HABD	17.8										
1 2,3	Aug-Oct	HABD	18.1										
3	Ott-Mar	CSTAB	25.0	HABD	25.0	PATHO	25.0	RIPCN	25.0				
3,4	Mar-May	CSTAB	25.0	FLOW	25.0	HABD		PATHO	25.0	RIPCN	25.0		
5	May-Ott	CSTAB	25.0	FLOW	25.0	HABD		PATHO	25.0	RIPCN	25.0	TEMP	16.6
6	Ott-Mar	HABD	25.0	PATHO	25.0	TEMP							
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawnera

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathway was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Bear Cr.
Reach: Little Bear Cr - headwaters (RM 109.3 -118.3 from Snake R)

[Restoration benefit category:	E	[Chinook usage score:	575.2	Habitat productivity loss score:	79.4]

Life stage	Months	No. life history pathways by current usage abundance level: Primary Total no.	1	2	3	4	Secondary Total no.	1	2	3	4	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	0	42	42	0	0	0	3.8	0.0	9.4
1,2,3	Aug-Ott	10	10	0	0	0	70	70	0	0	0	3.4	0.0	52.5
3	Oct-Mar	20	20	0	0	0	140	140	0	0	0	3.5	0.0	0.0
3,4	Mar-May	8	8	0	0	0	32	32	0	0	0	4.3	0.0	23.6
5	May-Oct	25	25	0	0	0	69	69	0	0	0	4.0	0.0	-3.5
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	3.5	0.0	-2.9
7	Mar-Jun	1	1	0	0	0	0	0	0	0	0	14.3	0.0	0.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	An 5	% change	Aft 6	% change
1	Apr-Aug	HABD	22.2										
1,2,3	Aug-Ott	HABD	8.3										
3	Ott-Mar	PATHO	12.5										
3,4	Mar-May	PATHO	25.0	RIPCN	25.0								
5	May-Ott	PATHO	25.0	RIPCN	25.0								
6	Ott-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathwaya using the reach in this table

Level 1: 0-10 spawnera
Level 2 10-30 spawners
Level 3: 30-60 spawnera
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Chesnimnus Cr.
Reach: Confluence with Crow Cr - South Fork (RM 52.7 -77.7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	$		NA	NA	NA
3,4	Mar-May	NA	NA	N A	NA	NA	NA	NA	NA			NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 apawners
Level 3: 30-60 spawners
Level 4: > 60 spawnera

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Catherine Cr.

Reach: Mouth - 10th Street Bridge in Union (RM 114.5 -146.0 from Snake R)

Restoration benefit category:	A	Chinook usage score:	495.2	Habitat productivity loss score:	-985.3

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	14	0	4	0	10	10	0	4	0	6	11.6	-70.3	-37.5
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	8	0	0	0	8	8	0	0	0	8	8.0	-78.5	-122.6
5	May-Ott	56	0	5	0	51	52	0	2	0	50	1.0	-93.7	-513.6
6	Oct-Mar	95	0	57	0	38	19	0	0	0	19	4.3	-61.5	-323.3
7	Mar-Jun	6	0	3	0	3	4	0	2	0	2	26.2	-2.6	11.7

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Aft 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	45.0	HABD	45.0	RiPCN	45.0	OBST	22.5	TEMP	22.5		
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	FLOW	750	HABD	75.0	RIPCN	50.0	NUTLD	25.0	PATHO	25.0	TEMP	25.0
5	May-Ott	FLOW	75.0	HABD	75.0	SEDLD	64.4	RIPCN	50.0	NUTLD	25.0	PATHO	25.0
6	Ott-Mar	HABD	64.0	SEDLD	64.0	FLOW	42.7	RIPCN	42.7	COMP	21.3	OBST	21.3
7	Mar-Jun	OBST	20.1	WITH	20.1								

Abundance /eve/ refers to the average abundance of spawnera that apawn in the natal stream reaches that populate the life history pathways using the reach in this table

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Levei 3: 30-80 spawners
- Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - fiow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WiTH - water withdrawals

"NA" Indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: 10th Street Bridge in Union - Little Catherine Cr (RM 146.0 -157.5 from Snake R)

Restoration benefit category:	D	Chinook usage score:	255.7	Habitat productivity loss score:	-438.6

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	9	0	4	0	5	7	0	4	0	3	7.7	-28.9	-23.5
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	14	0	10	0	4	14	0	10	0	4	6.5	-53.5	-151.3
5	May-Ott	50	0	46	o	2	50	o	49	0	1	4.9	-58.2	-206.6
6	Ott-Mar	o	0	0	0	0	19	0	19	0	o	3.4	-557	-561
7	Mar-Jun	1	0	0	0	1	2	0	2	0	0	16.9	11.3	0 . 9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Aft 2	% change	Att 3	% change	Att 4	% change	Aft 5	% change	Att 6	% change
1	Apr-Aug	TEMP	36.1	FLOW	24.1	HABD	24.1	OBST	24.1	RIPCN	24.1		
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	N	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	TEMP	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	WITH	50.0	CSTAB	37.5
5	May-Ott	TEMP	73.5	FLOW	49.0	HABD	49,0	RIPCN	49.0	WITH	49.0	PATHO	245
6	Ott-Mar	HABD	50.0	RIPCN	500	SEDLD	50.0	CSTAB	250	PATHO	250	WiTH	250
7	Mar-Jun	WITH	16.0										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the fife history pathways using the reach In thitable:

- Level 1: 0-10 spawners
- Levei 2: 10-30 spawners
- Level 3: 30-80 spawners
- Levei 4 > 60 spawners

Life ***stages:*** 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient ioad
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no fife history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: Little Catherine Cr - forks (RM 157.5 -164.4 from Snake R)

Restoration benefit category:	B	Chinook usage score:	932.6	Habitat productivity loss score:	-477.4

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	34	0	4	0	30	22	0	4	0	18	4.9	-54.3	-89.8
1,2,3	Aug-Oct	50	0	0	0	50	30	0	0	0	30	6.3	-18.0	-141.5
3	Oct-Mar	100	0	0	0	100	60	0	0	0	60	8.3	-3.6	-144.9
3,4	Mar-May	30	0	2	0	28	14	0	2	0	12	7.6	-38.2	-47.2
5	May-Oct	73	0	2	0	71	24	0	1	0	23	4.5	-59.1	-46.0
6	Oct-Mar	19	0	0	0	19	0	0	0	0	0	3.3	-61.5	-28.5
7	Mar-Jun	1	0	0	0	1	1	0	1	0	0	16.5	0.0	0.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	25.0	TEMP	25.0	HABD	20.8	CSTAB	12.5				
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	HABD	25.0	TEMP	25.0				
3	Oct-Mar	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25.0		
3,4	Mar-May	SEDLD	50.0	TEMP	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0
5	May-Oct	TEMP	50.0	HABD	36.0	SEDLD	36.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0
6	Oct-Mar	HABD	50.0	SEDLD	50.0	CSTAB	25.0	PATHO	25.0	TEMP	25.0		
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawnera
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: South Fork Catherine Cr (RM 164.4 -166.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	740.4	Habitat productivity loss score:	-427.9

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	24	o	24	0	0	24	0	24	0	0	3.0	0.0	-43.0
1,2,3	Aug-Oct	40	o	40	0	0	40	0	40	0	0	2.0	0.0	-99.4
3	Ott-Mar	80	0	80	0	0	80	0	80	0	0	2.0	0.0	-166.8
3 4	Mar-May	20	0	20	0	0	20	0	20	0	0	3.5	0.0	-80.5
5	May-Ott	46	0	46	0	0	48	0	48	o	0	3.1	0.0	1.4
6	Oct-Mar	0	o	0	0	0	19	0	19	0	0	2.0	0.0	-40.0
7	Mar-Jun	o	0	0	0	0	1	0	1	0	0	11.0	0.0	

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	167	TEMP	8.3						
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0	TEMP	25.0						
3	Ott-Mar	SEDLD	50.0	FLOW	25.0	TEMP	25.0	CSTAB	12.5	PATHO	12.5		
3,4	Mar-May	FLOW	,25.0	'PATHO'	25.0	SEDLD	25.0,	CSTAB	12.5	TEMP	12.5		
5	May-Ott	FLOW	25.0	PATHO	25.0								
6	Ott-Mar	SEDLD	50.0	CSTAB	250	FLOW	25.0	HABD	25.0	PATHO	25.0		
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Levet 3: 30-60 spawners
Level 4 > 60 spawners

Life ***stages:*** 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling preamolt/smelt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Mouth - Joseph Cr (RM 0,0- 3.7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	348.7	Habitat productivity loss score:	-1.9

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	96	32	36	16	12	222	116	68	24	12	33.8	0.0	0.
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	N A	N A	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	0	0	o	3	0	2	1	0	20.6	0.0	-5.4
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	65	20	s	12	8	203	110	60	22	11	109.8	0.0	3.6

Life stage	Months	Highest productivity impact attribute (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	12.5	NUTLD	12.5	OXYG	12.5						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	COMP	50.0	HABD	25.0	NUTLD	25.0	PATHO	25.0				
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	PATHO	6.5	TEMP	6.5								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathway was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Joseph Cr - Buford Cr (RM 3.7- 26.2 from Snake R)

Restoration benefit category:	E	Chinook usage score:	422.2	Habitat productivity loss score:	-45.6

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	74	26	25	17	6	168	90	46	26	6	33.8	9.8	0.0
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	0	0	0	3	0	2	1	0	20.6	0.0	-3.6
6	Ott-Mar	36	0	18	18	o	185	93	37	55	0	23.5	0.2	-44.7
7	Mar-Jun	59	16	24	13	6	176	104	40	26	6	119.3	2.6	2.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	19.6	NUTLD	19.6	OXYG	19.6						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	COMP	17.3	CHEM	8.7	HABD	8.7	NUTLD	8.7	PATHO	8.7		
6	Oct-Mar	SEDLD	9.9	PATHO	5.3	TEMP	5.3						
7	Mar-Jun	PATHO	5.6	TEMP	5.6								

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predatora (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Buford Cr - Bear Cr (RM 26.2 -28.2 from Snake R)

Restoration benefit category:	F	Chinook usage score:	141.0	Habitat productivity loss score:	-10.2

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	
1	Apr-Aug	48	16	16	6	6	111	59	34	12	6	33.6	0.0	0.0
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	"N A"	NA	"NA	NA	NA	NA	NA	NA	NA
5	May-Ott	0	0	0	0	0	6	1	3	2	0	20.6	0.0	-7.1
6	Ott-Mar	2	0	1	1	0	7	4	1	2	0	20.6	0.0	-5.4
7	Mar-Jun	46	16	17	7	6	98	54	30	8	6	108.3	0.0	2.3

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	An 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	6.1	NUTLD	6.1	OXYG	6.1						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	COMP	26.6	CHEM	13.3	HABD	13.3	NUTLD	13.3	PATHO	13.3		
6	Ott-Mar	SEDLD	29.7	PATHO	14.9								
7	Mar-Jun	PATHO	8.0	TEMP	8.0								

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Bear Cr - Menatchee Cr (RM 28.2 -34.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	245.4	Habitat productivity loss score:	-53.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	46	16	16	8	6	111	59	34	12	6	33.7	0.0	0 0
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	N A	NA	N	2	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA
5	May-Ott	o	0	0	0	0	7	1	3	3	0	20.6	0.0	-2.8
6	Ott-Mar	2	0	1	1	0	134	113	20	1	0	23.1	0.7	-51.7
7	Mar-Jun	46	16	17	7	6	98	54	30	8	6	106.9	0.0	1 . 5

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	15.3	NUTLD	15.3	OXYG	15.3						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	SEDLD	12.2	PATHO	6.1	COMP	5.7	CHEM	2.8	HABD	2.8	NUTLD	2.8
6	Oct-Mar	SEDLD	18.1	PATHO	14.0	TEMP	14.0						
7	Mar-Jun	PATHO	5.1	TEMP	5.1								

Abundance *level* refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawnera

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predatora (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria usad in defining these pathwavs was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Menatchee Cr - Wenaha R (RM 34.8 -45.1 from Snake R)

Restoration benefit category:	F	Chinook usage score:	216.1	Habitat productivity loss score:	-35.2

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	49	17	1	8	6	113	61	34	12	6	34.2	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	2	0	1	1	0	13	4	5	4	0	20.0	0.0	-9.2
6	Ott-Mar	36	0	18	18	o	172	99	18	55	0	24.2	0.0	-27.8
7	Mar-Jun	48	16	17	7	6	93	49	30	8	6	120.1	0.0	1.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	12.3	NUTLD	12.3	OXYG	12.3						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	COMP	22	CHEM	11.3	HABD	11.2	NUTLD	11.3	PATHO	11.2		
6	Ott-Mar	SEDLD	6.	PATHO	3.3	TEMP	3.1						
7	Mar-Jun	PATHO	6.1	TEMP	61								

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-80 spawners
Level 4: > 60 spawners

Life *stages:* 1 - prespawner; 2- apawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB . channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributea with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Wenaha R - Courtney Cr (RM 45.1 -46.2 from Snake R)

Restoration benefit category: F | **Chinook** usage score: 96.0 | **Habitat** productivity loss score: -6.9

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	44	15	16	7	6	102	57	29	10	6	39.9	0.0	0.0
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	2	0	1	1	0	6	2	1	3	0	71.3	0.0	-4.4
6	Ott-Mar	2	0	1	1	0	14	12	0	2	0	28.5	0.0	-3.7
7	Mar-Jun	40	15	14	5	6	82	43	28	5	6	140.3	0.0	1 . 2

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	6.1	NUTLD	6.1	OXYG	6,1	TEMP	6,1				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N A
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	SEDLD	11.6	COMP	6.5	HABD	5.6	PATHO	5.8	CHEM	3.3	NUTLD	3.3
6	Ott-Mar	SEDLD	14.8	HABD	7.4	PATHO	7.4						
7	Mar-Jun	TEMP	4.7										

Abundance /eve/ refers to the average abundance of spawnera that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

fife ***stages:*** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstruct ions
OXYG - dissolved oxygen
PATHO - pathogena
PRED - predatora (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Courtney Cr - Mud Cr (RM 46,2 -51.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	100.9	Habitat productivity loss score:	-15.8

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	44	15	16	7	6	102	57	29	10	6	33.4	0.0	0.0
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	2	0	1	1	0	8	4	1	3	0	60.0	0.0	-4.3
6	Ott-Mar	2	0	1	1	0	121	101	0	20	0	25.4	0.0	-12.5
7	Mar-Jun	40	15	14	5	0	82	43	28	5	6	116.4	0.0	1.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	5.8	NUTLD	5.8	OXYG	5.8	TEMP	5.8				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	COMP	8.9	CHEM	4.5	NUTLD	4.5	PAT HO	" "4.5"	TEMP	4.5		
6	Ott-Mar	SEDLD	6.5	HABD	3.3	PATHO	3.3	TEMP	3.1				
7	Mar-Jun	PATHO	4.0	TEMP	4.0								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Mud Cr - Wallupa/Wildcat Cr (RM 51.4 -52.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	114.7	Habitat productivity loss score:	-9.8

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	
1	Apr-Aug	44	15	16	7	6	102	57	29	10	6	24.2	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	3	0	2	1	0	8	4	1	3	0	46.9	0.0	-6.9
6	Oct-Mar	1	0	0	1	0	18	15	0	3	0	18.8	0.0	-3.9
7	Mar-Jun	40	15	14	5	6	76	38	28	4	6	89.4	0.0	1 . 0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Atf 1	% change	Att 2	% change	Aft 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	8.5	NUTLD	8.5	OXYG	8.5	TEMP	8.5				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar		? !	NA	NA	NA	NA	N?	NA	NA	NA	NA	NA
3,4	Mar-May		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	COMP	14.6	TEMP	14.6	SEDLD	10.7	C H E M	7.3	NUTLD	7.3	PATHO	7.3
6	Ott-Mar	SEDLD	13.2	HABD	6.6	PATHO	6.6						
7	Mar-Jun	PATHO	4.4	TEMP	4.4								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: **CHEM - chemicals**
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity

NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)

RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Wallupa/Wildcat Cr - Grossman Cr (RM 52.8 -61.1 from Snake R)

Restoration benefit category:	B	Chinook usage score:	453.3	Habitat productivity loss score:	-145.1

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	44	15	16	7	6	102	57	29	10	6	22.8	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	4	0	2	2	0	15	10	1	4	0	47.5	0.0	-21.9
6	Oct-Mar	19	0	19	0	0	181	160	19	2	0	20.7	0.0	-125.2
7	Mar-Jun	40	15	14	5	6	76	38	28	4	6	90.5	0.0	2.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	An 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	22,8	NUTLD	22.8	OXYG	22.8	TEMP	22.8				
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	COMP	22.2	TEMP	22.2	CHEM	11.1	NUTLD	11.1	PATHO	11.1		
6	Ott-Mar	SEDLD	39.7	PATHO	25.0	TEMP	25.0	HABD	19.9				
7	Mar-Jun	PATHO	9.0	TEMP	9.0								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life ***stages:*** 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Grossman Cr - Wallowa R (RM 61.1 -60.0 from Snake R)

Restoration benefit category:	A	Chinook usage score:	848.6	Habitat productivity loss score:	-914.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	54	17	20	11	6	121	67	34	14	6	31.5	0 0	0 0
1,2,3	Aug-Oct	NA	NA	NA	NA	$	N		NA		N	NA	NJ	NA
3	Oct-Mar	NA	NA	NA	NA		N		NA		NA	NA		NA
34	Mar-May	o	0	0	0	0	25	0	5	20	0	342	00	-725
5	May-Ott	6	0	3	3	0	166	28	21	117	0	58.1	0.0	-5294
6	Ott-Mar	36	19	0	19	0	408	225	108	57	16	22.1	00	-3143
7	Mar-Jun	40	16	13	5	6	71	32	29	4	6	107.7	0.0	2 . 2

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	22,3	NUTLD	22,3	OXYG	22.3	TEMP	223				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	COMP	50.0	TEMP	50.0	CHEM	25,0	FLOW	25.0	NUTLD	25.0	PATHO	25.0
5	May-Ott	COMP	500	TEMP	50.0	SEDLD	26.9	CHEM	250	NUTLD	25.0	PATHO	250
6	Ott-Mar	SEDLD	26.4	PATHO	16.6	TEMP	16.6	HABD	13.2				
7	Mar-Jun	PATHO	9.9	TEMP	9.9								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life ***stages:*** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Wallowa R - Lookingglass Cr (RM 80.0 -83,4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	78.4	Habitat productivity ioss score:	-32.6

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantity	% change	Habitat productivity ioss score
1	Apr-Aug	23	0	14		6	39	0	27	6	6	32,3	0.0	-123
1,2,3	Aug-Oct	NA	N'A	NA	N'A	NA	NA	NA	NA	NA	NA	N	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	NA
3 4	Mar-May	o	'o	0	0	0	6	0	1	5	o	341	0.0	-13.7
5	May-Ott	6	o	3	3	0	0	0	0	0	0	7.9	-14.0	-11.6
6	Ott-Mar	o	0	0	0	0	24	0	23	0	1	11 9	-3 8	-10 4
7	Mar-Jun	17	o	11	o	6	27	o	21	1	5	96.7	0.0	15.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	?6 change	Att 4	% change	Att 5	'% change	Att 6	% change
1	Apr-Aug	TEMP	18.8	CHEM	9.4	FLOW	9.4	HABD	9.4	NUTLD	9.4	OXYG	9.4
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
,384	Mar-May	FLOW	25.0	NUTLD	25.0	SEDLD	25.0	TEMP	25.0	CHEM	12.5	CSTAB	12.5
5	May-Oct	TEMP	'28.0"	COMP	14.0	FLOW	14.0	HABD	14.0	PATHO	14,0		
6	Ott-Mar	SEDLD	12.2	CSTAB	6.1	HABD	6.1	PATHO	6.1	RIPCN	6.1	TEMP	6.1
7	Mar-Jun	TEMP	6.0										

Abundance level refers to the average abundance of spawners that spawn in the natai stream reaches that populate the life history pathways using the reach in thi**table:**

- **Level** 1: 0-10 spawnera
- Levei 2: 10-30 spawners
- Levei 3: 30-60 spawners
- Levei 4 **> 60** spawners

Life stages: **1 - prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - ffOW
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved **oxygen**
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- **RIPCN** - **riparian** condition
- **SEDLD** - sediment ioad
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in t**template.**

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Lookingglass Cr - Gordon Cr (RM 83.4 -94.2 from Snake R)

Restoration benefit category:	F	Chinook usage score:	57.7	Habitat productivity loss score:	-64.2

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	17	0	11	0	6	31	0	25	0	6	12.7	1.8	-45.1
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	o	0	o	1	0	1	0	0	6.3	0.0	-0.8
6	Ott-Mar	o	o	0	0	0	115	0	78	0	37	8.0	.0.0	-28.4
7	Mar-Jun	17	n	11	n	6	24	0	19	0	5	46.1	0.2	10 [illegible]

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	16.8	HABD	16.8	NUTLD	16.8	RIPCN	16.8	CHEM	8.4	OXYG	8.4
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	SEDLD	13.0	FLOW	6.5	HABD	6.5	PATHO	6.5	TEMP	6.5		
6	Oct-Mar	SEDLD	6.7	FLOW	3.4	HABD	3.4	PATHO	3.4	TEMP	3.4		
7	Mar-Jun	TEMP	4.3										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Gordon Cr - Phillips Cr (RM 94.2 -96.9 from Snake R)

Restoration benefit category:	F	Chinook usage score:	31,0	Habitat productivity loss score:	-14.4

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no,	1	2	3	4			
1	Apr-Aug	17	0	11	0	6	?l	0	25	0	?	18.4	-4	-14.8
1,2,3	Aug-Oct	NA	NA	NA	A	NA	NA	NA	NA	NA	NA	NA	N	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA ,	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	O	0	0	0	0	3	0	26	o	1	13.1	??	-2.6
6	Oct-Mar	18	0	0	0	18	28	0	5			10.3	-10.7	-6.2
	Mar-Jun			11			18					53.1	-1.1	9.2

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Aft 2	% change	An 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	6.1	FLOW	4.1	HABD	4.1	NUTLD	4.1	RIPCN	4.1	CHEM	2.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	%	N	NA	NA	
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA		N	NA	NA	
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	A
5	May-Ott	FLOW	20.6	TEMP	20.6	HABD	"1 3.7	NUTLD	13.7	RIPCN	13.7	CHEM	6.9
6	Ott-Mar	HABD	4.4	PATHO	4.4	SEDLD	4.4	TEMP	4.4				
7	Mar-Jun	TEMP	4.5										

Abundance *level* refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

- Level 1: 0-10 spawners
- Level 2: 10-30 spawners
- Level 3: 30-60 spawners
- Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Phillips Cr - Clark Cr (RM 96.9 -97.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	11.5	Habitat productivity loss score:	-9.2

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	17	0	11	0	6	31	0	25	0	6	13.7	-4.0	-11.4
1 2 3	Aug-Ott	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	N A	NA	NA	NA	N A	N A	NA	NA
5	May-Ott	o	o	0	0	o	3	0	2	0	1	131	-0.6	-06
6	Ott-Mar	1	o	0	0	1	11	0	9	0	2	5 3	-75	-11
7	Mar-Jun	16	0	11	0	5	17	0	14	0	3	36.8	3.0	3 . 9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Art 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	4.7	FLOW	3.2	HABD	3.2	NUTLD	3.2	RIPCN	3.2	CHEM	1.6
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	HABD	1 . 6	PATHO	1.6	RIPCN	1.6	SEDLD	1 . 6	TEMP	1.6		
6	Ott-Mar	HABD	3.0	PATHO	3.0	RIPCN	3.0	SEDLD	3.0	TEMP	3.0		
7	Mar-Jun	TEMP	2.0										

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reachea that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Clark Cr - Indian Cr (RM 97,3 -99.3 from Snake R)

Restoration benefit category: F	**Chinook** usage score: 21,5	**Habitat** productivity loss score: -32.0

Life stage	Months	No. iife history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no	1	2	3	4			
1	Apr-Aug	17	0	11	0	6	31	0	25	0	6	12.6	-10.3	-31.1
[illegible]	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	0	0	0	4	0	3	0	1	13.1	0.0	-0.7
6	Oct-Mar	1	o	0	0	1	26	0	26	0	2	6.8	-6.6	-3.8
7	Mar-Jun	16	o	11	o	5	17	0	14	0	3	47.3	0.6	3.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Atf 2	% change	Atf 3	?6 change	Att 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	TEMP	12.9	FLOW	6.6	HABD	6.6	NUTLD	8.6	RIPCN	8.6	CHEM	4.3
1 2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	?W	NA
5	May-Ott	FLOW	3.9	TEMP	3.9	HABD	2.6	RIPCN	2 . 6	CHEM	1.3	COMP	1.3
6	Ott-Mar	TEMP	3.1	CSTAB	2.6	HABD	2.8	PATHO	2.8	RIPCN	2.8	SEDLD	2.8
7	Mar-Jun	TEMP	1.8										

Abundance *level* refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

- Level 1: 0-10 spawners
- Level 2: 10-30 spawners
- Level 3: 30-60 spawners
- Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - fiOW
- HABD - habitat diversity
- NUTLD - nutrient ioad
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment ioad
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in t template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Indian Cr - Willow Cr (RM 99.3 -103.5 from Snake R)

Restoration benefit category:	F	Chinook usage score:	50.0	Habitat productivity loss score:	-79.6

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life atage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	17	0	11	0	6	31	0	25	0	6	12.6	-26.5	-77.9
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	0	0	0	5	0	4	0	1	13.1	-1.5	-2.6
6	Ott-Mar	19	0	18	0	1	10	0	8	0	2	6.5	-11.0	-5.2
7	Mar-Jun	16	0	11	o	5	16	00	13	0 0	3	46.2	-0.5	6.1

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	322	FLOW	21.5	HABD	21.5	NUTLD	21.5	RIPCN	21.5	CHEM	107
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N A
3,4	Mar-,May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5'	May-Ott	HABD	41	PATHO	4 , 1	RIPCN	4.1	SEDLD	4.1	TEMP	4.1		
6	Ott-Mar	HABD	4.4	PATHO	4 4	RIPCN	4.4	SEDLD	4.4	TEMP	4.4		
7	Mar-Jun	TEMP	3.3										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 apawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: **Grande Ronde R.**

Reach: Willow Cr - downstream end of State Ditch (RM 103.5 -114,5 from Snake R)

Restoration benefit category:	**F**	**Chinook usage score:**	**92,3**	**Habitat productivity loss score:**	**29.7**

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	17	0	11	0	6	31	0	25	0	6	43.1	3.6	51.4
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	N A	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA
5	May-Ott	1	0	0	0	1	11	0	9	0	2	6.2	-22.7	-18.8
6	Ott-Mar	20	0	1	0	19	58	0	57	0	1	8.5	-7.6	-15.3
7	Mar-Jun	15	0	10	0	5	16	0	13	0	3	49.6	-4.0	12.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	46.8	CHEM	31.2	HABD	31.2	NUTLD	31.2	OXYG	31.2	RIPCN	31.2
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	F L O W	24.0	HABD	24.0	RIPCN	24.0"'	TEMP	24.0	CHEM	12.0	NUTLD	12.0
6	Ott-Mar	CHEM	3.8	HABD	3.8	NUTLD	3.8	PATHO	3.8	RIPCN	3.8	SEDLD	3.8
7	Mar-Jun	TEMP	8.9	WITH	6.9								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ffow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathway was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Downstream end of State Ditch - Upstream end of State Ditch (RM 114.5 -118.9 from Snake R)

Restoration benefit category:	D	Chinook usage score:	62.5	Habitat productivity loss score:	-202.9

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	8	0	7	0	1	24	0	21	0	3	11.6	-318	-29.1
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	"NA"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	0	0	0	0	0	11	0	10	0	1	8.3	-17.1	-24.8
6	Ott-Mar	0	0	0	0	0	58	0	40	0	18	1.5	-418	-153.6
7	Mar-Jun	8	0	7	0	1	10	0	8	0	2	30.3	-3.4	4.6

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Aft 1	% change	Att 2	% change	Aft 3	% change	Aft 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	HABD	29.6	FLOW	19.9	RIPCN	19.9	TEMP	19.9				
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	FLOW	25.7	HABD	25.7	RIPCN	25.7	SEDLD	25.7	CHEM	8.6	PATHO	8.6
6	Ott-Mar	FLOW	33.6	HABD	336	RIPCN	33.6	SEDLD	336	CHEM	11.2	PATHO	11.2
7	Mar-Jun	HABD	6.5										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the fife history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life ***stages:*** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Upstream end of State Ditch -1-84 crossing below Devil's Slide (RM 118.9 -128.4 from Snake R)

Restoration benefit category:	D	Chinook usage score:	78.9	Habitat productivity loss score:	-209.8

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
	Apr-Aug	8	0	7	0	1	24	0	21	0	3	2.6	-37.2	-40.4
	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	14	0	13	0	1	15.4	-2.8	-15.1
6	Oct-Mar	0	0	0	0	0	41	0	40	0	1	10.4	-53.9	-154.2
				7	0	1	7	0	6	0	1	63.1	0.0	-0.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Aft 5	% change	Att 6	% change
1	Apr-Aug	FLOW	29,2	HABD	29.2	TEMP	29.2	RIPCN	19.5				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	FLOW	23.2	TEMP	'23.2	HABD	15.5"	OXYG	15.5	RIPCN	15.5	CHEM	7.7
6	Ott-Mar	FLOW	72.7	HABD	48.5	OBST	46,5	RIPCN	48.5	SEDLD	48.5	WITH	25.0
7	Mar-Jun	WITH	7.5										

Abundance level refers to the average abundance of spawnera that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages.' 1-* prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: 1-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 -133.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	25.6	Habitat productivity loss score:	-62.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	8	0	7	0	1	24	0	21	0	3	3.4	-14.5	-18.6
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	0	0	0	0	0	18	0	16	0	2	6.8	-21.0	-27.1
6	Ott-Mar	0	0	0	0	0	37	0	37	0	0	2.0	-12.3	-17.5
7	Mar-Jun	6	0	7	0	1	5	0	4	0	1	69.3	0.0	1.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	An 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	11.7	RIPCN	11.7	TEMP	11.7						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	CSTAB	17,5	HABD	17,5	RIPCN	17.5	SEDLD	17.5	PATHO	8.7	TEMP	8.7
6	Ott-Mar	CSTAB	6.6	HABD	6.6	RIPCN	6.6	SEDLD	6.6	PATHO	3.3	TEMP	3.3
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes Indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Five Points Cr - Rock Cr (RM 133.4 -133.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	10.7	Habitat productivity loss score:	-12.7

Life stage	Months	No. life history pathways by current usage abundance level: Primary					Secondary					Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	4	Total no.	1	2	3	4	Patient quantity	% change	
1	Apr-Aug	8	0	7	0	1	24	0	21	0	3	2.3	-8.6	2.1
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	18	0	16	0	2	6.8	-7.8	-10.1
6	Oct-Mar	0	0	0	0	0	3	0	3	0	0	1.1	-44.0	-5.1
7	Mar-Jun	8	0	7	0	1	7	0	2	0	1	49.5	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	6.9	RIPCN	6.9	TEMP	6.9						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	RIPCN	9.8	TEMP	9.8	HABD	6.5	PATHO	3.3				
6	Oct-Mar	CSTAB	23.6	HABD	23.6	RIPCN	23.6	SEDLD	23.6	PATHO	11.8	TEMP	11.8
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmott/smelt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogena
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Rock Cr - Whiskey Cr (RM 133.8 -136.6 from Snake R)

Restoration benefit category:	F	Chinook usage score:	11.5	Habitat productivity ioss score:	-6.5

		NO. lifehistory pathways by current usage! abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life atage	Months	Total no.	1	2	3	A	Total no.	1	2	3	4			
1	Apr-Aug	8	0	7	0	1	24	n	21	n	3	1.9	-14.2	3.5
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	A"""" "'"	NA	NA	NA	NA	NA	NA	NA	NA IA
5	May-Oct	0	o	0	0	0	19	0	17	0	2	7.5	-5.6	-7.6'.6
6	Ott-Mar	o	0	0	0	0	2	0	2	o	0	1.3	-34.7	-2.7
7	Mar-Jun	R	n	7	n	1	3	n	2	0	1	41.3	0.0	0.3 3

		Highest productivity impact attributes (% change in impact from template)											
Life stagee	Months	Att 1	% change	Atf 2	96 change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	114.	RIPCN	11.4	TEMP	11.4						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	CSTAB	4.7	HABD	47	RIPCN	'4.7	SEDLD	4.7	PATHO	2.3	TEMP	2.3
6	Oct-Mar	CSTAB	18.6	HABD	18.6	RIPCN	18.6	SEDLD	18.6	PATHO	9.3	TEMP	9.3
7	Mar-Jun												

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this **table:**

Levei 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages.' 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling **presmolt/smolt**

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes **fishing-related** losses)
RIPCN - **riparian** condition
SEDLD - sediment ioad
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Whiskey Cr - Jordan Cr (RM 136.6 -139.1 from Snake R)

Restoration benefit category:	F	Chinook usage score:	43.3	Habitat productivity loss score:	-80.5

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no,	1	2	3	4			
1	Apr-Aug	8	0	7	0	1	24	0	21	0	3	2.1	-24.0	5.8
1,2,3	Aug-Oct	NA	NA	NA		NA	NA	NA	/	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA		NA	NA	NA		NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	21	0	19	0	2	8.3	-12.7	-19.2
6	Oct-Mar	0	0	0	0	0	19	0	19	0	0	1.4	-93.3	-68.1
7	Mar-Jun	8	0	7	0	1	3	0	2	0	1	30.3	0.0	0.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	19.3	RIPCN	19.3	TEMP	19.3						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N A	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
.3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	N?	NA		NA
5	May-Ott	RIPCN	15.9	"TEMP	15.9	HABD	10.8	PATHO	5.3				
6	Ott-Mar	CSTAB	50.0	HABD	50.0	RIPCN	50.0	SEDLD	50.0	PATHO	250	TEMP	25.0
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reachea that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawnera

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathway was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Jordan Cr - Beaver Cr (RM 139.1 -145.8 from Snake R)

Restoration benefit category:	A	Chinook usage score:	461.2	Habitat productivity ioss score:	-2077.9

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantii	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug		2		0		22		36	1		2.0	-53.8	218.5
1,2,2,3	Aug-Ott		o		0		30		30			6.2	-42.8	315.8
3	Ott-Mar	20	0	20	0	0	60	o	60	0	0	8.3	-2.2	-513.8
3 4	Mar-May	8	0	8	0	0	24	0	24	0	0	4.4	-78.3	-258.4
5	May-Ott	25	0	25	0	0	88	0	86	0	2	10.0	-500	-888.4
6	Ott-Mar	19	0	19	0	0	36	0	18	0	18	1.4	-39.9	-840
7	Mar-Jun	8	0	7	0	1	2	0	1	0	1	30.3	-4.8	1.0,

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	An 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	75,0	HABD	62.5						
1,2,3	Aug-Oct	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	HABD	62,5	CSTAB	50,0		
3	Ott-Mar	SEDLD	75.0	TEMP	75,0	CSTAB	50.0	FLOW	25,0	HABD	25.0	RIPCN	25.0
3,4	Mar-May	RIPCN	75.0	TEMP	75.0	HABD	50.0	CSTAB	37.5	SEDLD	37.5	FLOW	25.0
5	May-Ott	RIPCN	75.0	TEMP	75.0	HABD	50.0"	""PATHO	25.0	CSTAB	18.0	SEDLD	18.0
6	Ott-Mar	CSTAB	21.3	HABD	21.3	RIPCN	21.3	SEDLD	21.3	PATHO	10.7	TEMP	10.7
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the iife history pathways using the reach in this table

Levei 1: O-t O spawners
Levei 2: 10-30 spawners
Levei 3: 30-60 spawners
Levei 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Beaver Cr - Meadow Cr (RM 145.8 -147.0 from Snake R)

Restoration benefit category:	A	Chinook usage score:	450.8	Habitat productivity loss score:	-2081.1

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no,	1	2	3	4			
1	Apr-Aug	12	0	11	0	1	36	0	33	0	3	2.1	-53.7	-220.4
1.2 3	Aug-Ott	10	o	10	0	0	30	0	30	0	0	5.6	-46.7	-315.8
3	Ott-Mar	20	0	20	0	0	60	0	60	0	0	10.1	0.0	-513.8
3.4	Mar-May	8	0	8	0	0	2 4	0	24	0	0	5.6	-76.7	-258.4
5	May-Oct	25	o	25	0	0	85	0	83	0	2	10.2	-53.4	-699.8
6	Ott-Mar	19	o	19	o	0	2	0	1	0	1	1.7	-91.5	-73.8
7	Mar-Jun	7	0	6	0	1	0	0	0	0	0	41.3	0.0	0.8

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Art 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	75.0	HABD	40.2	RIPCN	40.2	SEDLD	37.5	CSTAB	25.0		
1.2 3	Aug-Ott	HABD	75.0	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0		
3	Ott-Mar	SEDLD	75.0	TEMP	750	CSTAB	50.0	FLOW	50,0	HABD	50.0	RIPCN	50.0
3,4	Msr-May	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0	FLOW	50.0	HABD	50.0
"s	May-Ott	RIPCN	66.7	TEMP	66.7	HABD	44.5	PATHO	22.2				
6	Ott-Mar	CSTAB	48.9	HABD	48.9	RIPCN	48.9	SEDLD	48.9	PATHO	24.5	TEMP	24.5
7	Mar-Jun												

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawnera
Level 3 30-80 spawners
Level 4: > 60 apawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Meadow Cr - Fly Cr (RM 147.0 -151.3 from Snake R)

Restoration benefit category:	A	Chinook usage score:	453.6	Habitat productivity loss score:	-1516,0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	11	o	10	0	1	33	0	30	0	3	6.4	-42.0	-225.9
1,2,3	Aug-Ott	10	0	10	0	0	30	0	30	0	0	4.9	-60.0	-360.6
3	Ott-Mar	20	0	20	0	0	60	0	60	0	0	6.2	-Bqo	-303.0
3 4	Mar-May	8	0	8	0	0	24	0	24	0	0	8.4	-60.0	-200.5
5	May-Ott	25	o	25	0	0	83	0	80	0	3	6.0	-54.4	-382.3
6	Ott-Mar	19	0	19	0	0	1	0	1	0	0	6.2	-58.2	-442
7	Mar-Jun	6	0	5	0	1	0	0	0	0	0	26.7	0.0	0.7,

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Atf 2	% change	Atf 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	52.5	RIPCN	35.0	HABD	20.9						
1,2,3	Aug-Oct	TEMP	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	HABD	37.5		
3	Ott-Mar	CSTAB	50,0	SEDLD	50.0	TEMP	50.0	RIPCN	25.0	FLOW	12.5	HABD	12.5
3,4	Mar-May	TEMP	75,0	RIPCN	50,0	CSTAB	2s.0	HABD	25.0	PATHO	25.0	SEDLD	25.0
5	May-Ott	TEMP	75.0	RIPCN	50.0	HABD	25.0	PATHO	25.o	CSTAB	16.6	SEDLD	16.6
6	Ott-Mar	CSTAB	48.5	RIPCN	46.5	SEDLD	48.5	PATHO	24.3	TEMP	24.3		
7	Mar-Jun												

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

- **Level 1:** 0-10 spawners
- **Level 2** 10-30 spawners
- **Level 3:** 30-60 spawners
- **Level 4:** > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

- CHEM - chemicals
- cSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.

Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Fly Cr - head of canyon 1.3 miles downstream of SheepCr (RM 151.3 -159.4 from Snake R)

Restoration benefit category:	A	Chinook usage score:	663.0	Habitat productivity loss score:	-1790,7

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	10	o	9	0	1	30	0	27	0	3	7.8	-44.4	-174.0
1,2,3	Aug-Oct	1	0	10	0			0	30	0	0	4.8	-60.0	-365.3
3	Ott-Mar	20	0	20	0			0	60	0	0	5,6	-61.8	-303.0
34	Mar-May	13	0	13	0	0	39	0	39	0	0	8.4	-60.0	-322.0
5	May-Ott	50	0	50	o	o	147	o	144	0	3	6.9	-71.0	-540.4
6	Ott-Mar	38	0	38	o	0	0	0	0	0	0	5.7	-61.9	-87.2
7	Mar-Jun	5	0	4	0	1	0	0	0	0	0	27.4	0.0	1.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Aft 3	% change	Aft 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	TEMP	62.5	RIPCN	35.5	CSTAB	25.0	HABD	25.0	SEDLD	25.0		
1,2,3	Aug-Oct	TEMP	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	HABD	25.0		
3	Ott-Mar	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	TEMP	50.0	FLOW	25.0	HABD	25.0
3,4	Mar-May	TEMP	75.0	CSTAB	50.0	RIPCN	500	SEDLD	50.0	FLOW	250	HABD	25.0
5	May-Oct	TEMP	73.3	RIPCN	48.8	HABD	24.4	PATHO	24.4				
6	Ott-Mar	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	PATHO	25.0	TEMP	25.0		
7	Mar-Jun												

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life ***stages:*** 1- prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearting presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment toad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 -164.2 from Snake R)

Restoration benefit category:	A	Chinook usage score:	448.5	Habitat productivity loss score:	-1337.3

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no,	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	9	0	8	0	1	27	0	24	0	3	4.9	-44.1	-158.6
1,2,3	Aug-Ott	10	0	10	0	0	30	o	30	0	0	6.3	-18.0	-367.8
3	Ott-Mar	20	0	20	0	0	60	0	60	0	0	9.1	-4.5	-2865
3 4	Mar-May	9	0	9	0	0	27	0	2 7	o	0	7.7	-51.3	-182.4
5	May-Ott	25	0	25	0	o	75	o	72	0	3	4.4	-70.2	-289.8
6	Oct-Mar	19	0	1a	0	0	0	0	0	o	0	3.6	-619	-529
7	Mar-Jun	3	0	2	0	1	0	0	0	0	0	17.6	0.0	0.6

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	An 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	75.0	HABD	62.5	FLOW	50.0	OXYG	250	NUTLD	151
1,2,3	Aug-Oct	CSTAB	75.0	RIPCN	75.0	TEMP	75.0	HABD	62.5	FLOW	50.0	SEDLD	500
3	Ott-Mar	CSTAB	75.0	SEDLD	50.0	TEMP		HABD	37	FLOW	25.0	RIPCN	25.0
3,4	Mar-,May	HABD	75.0	RIPCN	75.0	TEMP		CSTAB	35	NUTLD	25.0	PATHO	25.0
5	May-Ott	HABD	75.0	RIPCN	750"	TEMP	75.0	CSTAB	27.9	NUTLD	25.0	PATHO	25.0
6	Ott-Mar	CSTAB	50.0	HABD	50.0	RIPCN	50.0	PATHO	25.0	SEDLD	25.0	TEMP	25.0
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life ***stages:*** 1- prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: LimberJim Cr - Clear Cr (RM 164.2 -166.9 from Snake R)

Restoration benefit category	B	Chinook usage score:	500.0	Habitat productivity loss score:	-284.7

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantii	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	8	0	2	0	6	24	0	6	0	18	1.4	-65.7	-12.4
1,2,3	Aug-Oct	10	0	0	0	10	30	0	0	0	30	27	-25.0	-25.9
3	Ott-Mar	20	0	0	0	20	60	0	0	0	60	7.4	0.0	-117.8
34	Mar-May	9	0	1	0	8	27	0	3	0	24	14.4	-45.6	-63.9
5	May-Ott	25	0	0	0	25	72	0	3	0	69	8.0	-586.	-25.2
6	Ott-Mar	19	0	0	0	19	0	0	0	0	0	7.5	-60.0	-401
7	Mar-Jun	2	0	1	0	1	0	0	0	0	0	46.2	0.0	0.5

Life stage	Months	Highest productivity impact attributes ("A change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	CSTAB	25.0	RIPCN	18.9	HABD	12.5				
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0	HABD	12.5				
3	Ott-Mar	RIPCN	50.0	SEDLD	50.0	CSTAB	25.0	PATHO	25.0				
3,4	Mar-May	RIPCN	75.0	SEDLD	39.5	FLOW	25.0	HABD	25.0	PATHO	25.0	CSTAB	19.7
5	May-Ott	RIPCN	73.2	FLOW"	24.4	HABD	24.4	PATHO	24.4				
6	Oct-Mar	CSTAB	50.0	FLOW	50.0	HABD	50.0	SEDLD	50.0	PATHO	25.0	RIPCN	25.0
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life ***stages: 1-*** prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 8- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Clear Cr - headwaters (RM 166.9 -170.1 from Snake R)

Restoration benefit category:	B	Chinook usage score:	657.4	Habitat productivity loss score:	-437.8

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	12	0	12	0	0	36	0	36	0	0	4.3	0.0	-25.9
1,2,3	Aug-Ott	20	0	20	0	0	60	0	60	0	0	3.0	0 0	-51.8
3	Ott-Mar	40	0	40	0	0	120	0	120	0	0	4.8	0 0	-235.7
3,4	Mar-May	10	0	10			30	0	30		0	6.5		-49
5	May-Ott	25	0	25			69	0	69	0	0	4.5		-25
6	Oct-Mar	19	o	19	0	0	0	0	0	0	0	4.8	0.0	-50.2
7	Mar-Jun	1	0	1	0	0	0	0	0	0	0	18.9	0.0	0 . 5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	25.0	SEDLD	25.0	CSTAB	12.5						
1,2,3	Aug-Ott	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0						
3	Ott-Mar	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0	PATHO	12.5				
3 4	Mar-May	RIPCN	50.0	CSTAB	25.0	PATHO	25.0	SEDLD	25.0				
5	May-Ott	FLOW	50.0	HABD	50.0	RIPCN	50.0	SEDLD	50.0	CSTAB	25,0	PATHO	25.0
6	Ott-Mar	FLOW	50.0	HABD	50.0	SEDLD	50.0	CSTAB	25.0	PATHO	25.0	RIPCN	25.0
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in thi table:

Level 1: 0-10 apawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages.' 1- prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - *frow*
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Hurricane Cr.
Reach: Mouth - Lower Alderslope Ditch (RM 121.9 -124.9 from Snake R)

Restoration benefit category:	A	Chinook usage score:	524.2	Habitat productivity loss score:	-1973.7

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	6	6	0	0	0	42	42	0	0	0	0.6	-94.4	-165.5
1,2,3	Aug-Oct	10	10	0	0	0	70	70	0	0	0	2.3	-83.6	-660.4
3	Oct-Mar	20	20	0	0	0	140	140	0	0	0	3.2	-80.2	-512.3
3,4	Mar-May	2	2	0	0	0	38	38	0	0	0	3.8	-82.2	-336.2
5	May-Oct	0	0	0	0	0	94	94	0	0	0	3.6	-83.8	-198.9
6	Oct-Mar	0	0	0	0	0	19	19	0	0	0	3.3	-80.2	-101.3
7	Mar-Jun	0	0	0	0	0	1	1	0	0	0	13.2	-53.8	1.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	?4 change	Aft 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Att 6	% change
1	Apr-Aug	FLOW	50.0	HABD	50.0	RIPCN	50.0	TEMP	50,0	SEDLD	37.5	CSTAB	12.5
1,2,3	Aug-Oct	SEDLD	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	TEMP	50.0	CSTAB	25.0
3	Ott-Mar	HABD	75.0	SEDLD	75.0	RIPCN	50.0	TEMP	50.0	CSTAB	25.0	FLOW	25
3 4	Mar-May	HABD	75.0	SEDLD	75.0	FLOW	50.0	RIPCN	50.0	TEMP	50.0	CSTAB	25
5	May-Ott	HABD	75.0	FLOW	50.0	RIPCN	5 0 . 0	PATHO	2 5 . 0	PRED	25.0		
6	Oct-Mar	HABD	50.0	SEDLD	50.0	TEMP	50.0	CSTAB	25.0	PATHO	25.0		
7	Mar-Jun												

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that **populate** the iife history pathways using the reach in this **table:**

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level **3:** 30-60 spawners
Level 4 **> 60** spawners

Life stages: 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling **presmolt/smolt**

Attributes:
CHEM - chemicals
CSTAB - **channel stability**
COMP - competition (with other species)
FLOW - **flow**
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved **oxygen**
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Hurricane Cr.
Reach: Lower Alderslope Ditch - Upper Alderslope Ditch Diversion (RM 124.9 -128.2 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity ioss score:	0.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	NA
3	Ott-Mar	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA
3.4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3.4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	?!	NA	NA	%		NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA			NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

- **Level 1:** 0-10 spawners
- **Level 2** **10-30** spawners
- Level **3:** 30-60 spawners
- Level **4:** **> 60** spawners

Life ***stages:*** 1 - **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- **overwintering;** 7- yearling **presmolt/smolt**

Attributes:
- CHEM - chemicals
- **CSTAB** - channel stability
- COMP - competition (with other species)
- FLOW - **flow**
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- **RIPCN** - **riparian** condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Joseph Cr.

Reach: Mouth - Cottonwood Cr (RM 3.7- 8.2 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	10ss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Joseph Cr.
Reach: Cottonwood Cr - Swamp Cr (RM 8.2- 37.7 from Snake R)

Restoration benefft category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	N	NA	NA	NA	NA	N?	NA	NA	NA	NA	NA	
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	%	NA	NA	NA	NA	NA	N		$	NA
	Mar-May	NA	NA		NA	NA	NA	NA		N			NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA?	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathwaya using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftow
HABD - habitat diversity

NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-reiated losses)

RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways wspresent.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Joseph Cr.
Reach: Swamp Cr - Chesnimnus Cr (RM 37.7 -52.7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Att 2	% change	Att 3	% change	Att 4	?4 change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawnera that spawn in the natal stream reaches that populate the tife history pathwaya using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

***Life* stages.' 1-** prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
i-tABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lookingglass Cr.

Reach: Mouth - Little Lookingglass Cr (RM 83.4 -87.6 from Snake R)

Restoration benefit category:	B	Chinook usage score:	611.0	Habitat productivity loss score:	-300.5

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity
		Primary					Secondary					Patient		
Life stage	Montha	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	21	0	18	3	0	18	0	12	6	0	5.0	0.0	-52.4
1,2,3	Aug-Oct	30	0	30	0	0	20	0	20	0	0	2.6	-51.0	-191.0
3	Oct-Mar	60	0	60	0	0	40	0	40	0	0	2.7	-60.0	-13.1
3,4	Mar-May	24	0	24	0	0	15	0	10	5	0	6.3	-29.7	-16.6
5	May-Oct	72	0	69	3	0	25	0	25	0	0	4.9	0.0	-25.1
6	Oct-Mar	0	0	0	0	0	19	0	19	0	0	2.7	0.0	-2.3
7	Mar-Jun	O	o	o	o	o	2	o	1	1	0	16,5	0.0	0.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	42.1	PATHO	25.0								
1,2,3	Aug-Oct	TEMP	50.0	HABO	25.0	PATHO	25.0						
3	Oct-Mar	FLOW	25.0	PATHO	25.0								
3,4	Mar-May	FLOW	25.0	HABD	25.0			TEMP	25.0				
5	May-Oct	HABD	25.0	PATHO	25.0	TEMP	25.0	CSTAB	12.6				
6	Oct-Mar	CSTAB	25.0	HABD	25.0	OBST	25.0	PAT HO	25.0	TEMP	25.0	WITH	25.0
7	Mar-Jun	OBST	14.2	PATHO	14.2	WITH	14.2						

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawnera

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

CHEM - chemicals	NUTLD - nutrient load	RIPCN - riparian condition
CSTAB - channel stability	OBST - obstructions	SEDLD - sediment load
COMP - competition (with other species)	OXYG - dissolved oxygen	TEMP - water temperature
FLOW - flow	PATHO - pathogens	WITH - water withdrawals
HABD - habitat diversity	PRED - predators (includes fishing-related losses)	

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream: **Lookingglass** Cr.
Reach: **Little** Lookingglass **Cr** - headwaters (RM 87.6 -93.8 from Snake R)

Restoration benefit category:	E	**Chinook usage score:**	825.0	Habitat productivity loss score:	-65.5

		No. life history pathways by current usage abundance level										Key habitat char	
		Primary					Secondary					Patient	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	?	3	A	quantity	% cha
1	**Apr-Aug**	18	0	o	18	o	36"	o	0	36	0	2.2	0.0
1,2,3 -""	Aug-Ott	30	0	0	30	0	60	0	0	60	0	3.8	0.0
3	Ott-Mar	60	0	0	60	0	120	0	0	120	0	4.9	-1.
34-,	Mar-May	24	0	0	24	0	la	0	o	18	o	38	-3.
5	**May-Oct**	69	o	0	69	0	25	0	0	25	0	2.2	-1.
6	Ott-Mar	o	0	0	0	0	19	0	0	19	0	20	-1
7	**Mar-Jun**	o	0	0	0	0	1	0	0	1	0	8.5	0.0

		Highest productivity impact attributes (% change in **impact** from **template**)											
Life stage	Months	Att 1	% change	Att 2	% change	At! 3	% change	Att 4	% change	At! 5	% change	Att 6	% cha
1	**Apr-Aug**	PATHO	25.0										
1,2,3	**Aug-Oct**	PATHO	25.0										
3	Ott-Mar	PATHO	250	FLOW	12.5								
3,4	Mar-May	HABD	25.0	PATHO	25.0	FLOW	12.5						
5	May-Ott	HABD	25.0	PATHO	25.0								
6	Ott-Mar	""cSTAB"	25.0	PATHO	25.0	TEMP	25.0						
7	**Mar-Jun**	**PATHO**	25.0										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 **> 60** spawners

Life stages.' 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling **presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - **flow**
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved **oxygen**
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Mouth - Clear'water Ditch (RM 105.8 -108.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	15.6	Habitat productivity loss score:	-21.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no,	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	9	7	0	2	0	15	13	0	2	0	9.0	-10.1	1.1
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	???	NA	NA	NA	NA
34	Mar-May	2	2	0	0	0	6	6	o	0	0	18.0	4.1	-18.5
5	May-Oct	2	1	0	1	0	9	7	0	2	0	12.4	1.4	-3.5
6	Oct-Mar	1	1	0	0	0	0	0	0	0	0	12.4	3.3	-0.4
7	Mar-Jun	4	3	0	1	0	0	0	0	0	0	21.5	0,7	0 . 4

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	13.6	TEMP	136	OBST	9.1	HABD	4.5				
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-,May	TEMP	24.8	CSTAB	12.4	FLOW	12.4	WITH	12.4				
5	May-Ott	TEMP	1 0 . 5	'FLOW"	3.5	HABD	3 . 5	PATHO	3.5	WITH	3.5		
6	Ott-Mar	FLOW	16.4	CSTAB	8.2	HABD	6.2	PATHO	8.2	SEDLD	?? ?		
7	Mar-Jun	WiTH	2.1										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Levei 3: 30-60 spawners
- Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RiPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present In the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Clearwater Ditch - Cross Country Ditch (RM 108.3 -110.8 from Snake R)

Restoration benefit category:	A	Chinook usage score:	626.8	Habitat productivity loss score:	-704.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	19	17	0	2	0	45	43	0	2	0	6.4	-57.6	-540
1,2,3	Aug-Ott	20	20	0	0	0	60	60	0	0	0	9.5	-48.3	-2101
3	Ott-Mar	40	40	0	0	0	120	120	0	0	0	13.4	-32.3	-118.3
34	Mar-May	11	11	0	0	0	33	33	0	0	0	10.4	-40.4	-202.4
5	May-Ott	27	26	0	1	0	75	73	0	2	0	62	-62.7	-97.0
6	Ott-Mar	20	20	0	0	0	0	0	0	0	0	13.4	9.2	-24.2
7	Mar-Jun	4	3	0	1	0	0	0	0	0	0	23.1	5.5	1.7

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	TEMP	25.0	HABD	17.6	WITH	17.6				
1,2,3	Aug-Oct	CSTAB	25.0	FLOW	25.0	SEDLD	25.0	TEMP	25.0	WITH	25.0	HABD	12.5
3	Oct-Mar	CSTAB	25.0	FLOW	25.0	HABD	25.0	SEDLD	25.0	WITH	25.0	PATHO	12.5
3,4	Mar-May	HABD	50.0	FLOW	25.0	PATHO	25.0	TEMP	25.0	WITH	25.0	CSTAB	11.8
5	May-Oct	HABD	50.0	FLOW	25.0	PATHO	25.0	TEMP	25.0	WITH	25.0	CSTAB	8.9
6	Oct-Mar	HABD	48.4	CSTAB	24.2	PATHO	24.2	SEDLD	24.2				
7	Mar-Jun	WITH	8.2										

Aburrr/ante level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-80 spawners
Level 4: > 60 spawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Cross Country Ditch - Sheep Ridge Dam (RM 110,8 -115.0 from Snake R)

Restoration benefit category:	D	**Chinook** usage score:	218.5	**Habitat** productivity loss score:	-492.4

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	12	10	0	2	0	24	22	0	2	0	8.0	-16.8	-151.0
1 2 3	Aug-Ott	10	10	0	0	0	30	30	0	0	0	2.0	-664	-1587
3	Ott-Mar	20	20	0	0	0	60	60	0	0	0	0.9	-83.9	-117.2
34	Mar-May	2	2	0	0	0	6	6	0	0	0	0.9	-83.3	-54.5
5	May-Ott	3	2	0	1	0	6	4	o	2	0	4.5	-23.8	-11.6
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	3	2	0	1	0	0	0	0	0	0	19.8	0.0	0 . 5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	FLOW	56,5	HABD	37.7	WITH	37.7	CSTAB	25.0	OBST	18.8	RIPCN	18.8
123	Aug-Ott	FLOW	75.0	CSTAB	50.0	HABD	50.0	WITH	50.0	OBST	25.0	RIPCN	25.0
3	Oct-Mar	CSTAB	50.0	HABD	5 0 0	FLOW	25.0	PATHO	25.0	WITH	25.0		
34	Mar-May	CSTAB	50.0	HABD	500	FLOW	25.0	PATHO	25.0	WITH	25.0		
5	May-Ott	FLOW	17.2	WITH	17.2	HABD	8.6	PATHO	8.6	RIPCN	8.6		
8	Ott-Msr	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	WITH	3.5										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the tife history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 8- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Sheep Ridge Dam - Silver Cr (RM 115.0 -120.0 from Snake R)

Restoration benefit category:	E	Chinook usage score:	541,6	Habitat productivity loss score:	-34.6

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Montha	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	16	4	0	12	0	16	4	0	12	0	8.9	-54.9	3.3
1,2,3	Aug-Oct	$	?	0	?	!	$	0			0	10.0	-24.1	25.4
3	Ott-Mar		o	0		0		0			0	13.3	0.0	2.7
34	Mar-May	16	o	0	16	0	16	0	0	16	0	99	-43.6	-935
5	May-Ott	50	2	0	48	0	50	4	0	46	0	18.4	-8.9	40.3
6	Ott-Mar	19	0	0	19	0	0	0	0	0	0	5.4	-60.0	-13.3
7	Mar-Jun	3	2	0	1	0	0	0	0	. 0	0	23.1	0.0	0 . 4

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Atf 3	% change	Att 4	?6 change	Atf 5	% change	Att 6	% change
1	Apr-Aug	HABD	16.2										
1,2,3	Aug-Oct	CSTAB	25.0	HABD	12.5								
3	Ott-Mar	CSTAB	25.0	HABD	12,5	PATHO	12.5	RIPCN	12.5	WITH	12.5		
34	Mar-May	CSTAB	25.0	PATHO	25.0	HABD	12.5	RIPCN	12.5	WITH	12.5		
5	May-Ott	PATHO	25.0	TEMP	12.9								
6	Ott-Mar	PATHO	25.0	TEMP	25,0								
7	Mar-Jun	WITH	11.5										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the tife history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Silver Cr - Lake Cr (RM 120.0 -124.6 from Snake R)

Restoration benefit category:	E	Chinook usage score:	479.6	Habitat productivity loss score:	-9.7

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	14	14	0	0	0	14	14	0	0	0	7.0	0.0	0.0
1,2,3	Aug-Oct	20	20	0	0	0	20	20	0	0	0	5.0	0.0	-50.2
3	Oct-Mar	40	40	0	0	0	40	40	0	0	0	4.8	0.0	0.0
3,4	Mar-May	16	16	0	0	0	16	16	0	0	0	6.0	0.0	18.6
5	May-Oct	49	49	0	0	0	48	48	0	0	0	6.2	0.0	39.5
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	4.8	0.0	-18.1
7	Mar-Jun	2	2	0	0	0	0	0	0	0	0	19.8	0.0	0.6

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	22.4	OBST	22.4	PRED	12.5						
123	Aug-Ott	HABD	25.0	OBST	25.0	PRED	12.5						
3	Oct-Mar	PATHO	25.0										
34	Mar-May	PATHO	25.0										
5	May-Ott	PATHO'	24.5										
6	Ott-Mar	HABD	25.0	PATHO	25.0								
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 apawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook **Salmon** Life Histories

Stream: **Lostine** R.
Reach: Lake Cr - East Lostine R (RM 124.6 -131.7 from Snake R)

Restoration benefit category:	E	**Chinook** usage score:	475.0	**Habitat** productivity loss score:	-49.8

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	ioss score
1	Apr-Aug	12	12	0	0	0	12	12	0	0	0	4.8	0.0	0.0
1,2,3	Aug-Ott	20	20	0	0	0	20	20	0	0	0	4.0	0.0	-50.2
3	Ott-Mar	40	40	0	0	0	40	40	0	0	0	3.8	0.0	0.0
34	Mar-May	16	16	0	0	0	16	16	0	0	0	4.0	0.0	18.6
5	May-Ott	48	48	0	0	0	46	46	0	0	0	4.4	0.0	-3.4
6	Ott-Mar	19	19	0	0	0	0	0	0	0	0	3.8	0.0	-15.3
7	Mar-Jun	1	1	0	0	0	0	0	0	0	0	13.8	0,0	0 . 5

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	OBST	25.0	PRED	12.5						
1,2,3	Aug-Oct	HABD	25.0	OBST	12.5	PRED	12.5						
3	Ott-Mar	PATHO	12.5										
34	Mar-May	PATHO	17.2										
5	May-Ott	HABD	25.0	PATHO	25.0								
6	Ott-Mar	HABD	25.0	PATHO	25.0								
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 apawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiOW
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment toad
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Mouth - Cougar Cr (RM 89.8 -99.4 from Snake R)

Restoration benefit category: F	Chinook usage score: 23.8	Habitat productivity loss score: 17.6

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	6	2	2	2	0	6	2	2	2	0	3.2	-55.0	21.7
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	2	1	0	1	0	6	2	2	2	0	12.8	0.0	-4.0
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	4	1	2	1	0	0	0	0	0	0	60.8	0.0	0.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	33.0										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	FLOW	13.2	PATHO	13.2								
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1 - prespawner; 2- apawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Cougar Cr - Little Miriam R (RM 99.4 -108.4 from Snake R)

Restoration benefit category: B	**Chinook** usage score: 539.6	**Habitat** productivity loss score: -380.7

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	$	12	2	2	0	16	12	2	?	0	2.8	-81.9	-104
1,2,3	Aug-Ott		20	0	0	0	20	20	0	0	0	98	-22.8	-203
3	Ott-Mar	40	40	0	0	0	40	40	0	0	0	14.4	6.7	-180.7
34	Mar-May	16	16	0	0	0	16	1 6	o	0	0	17.5	7.9	-116.6
5	May-Ott	49	48	0	1	o	50	48	2	2	0	15.7	5.7	-45.5
6	Ott-Mar	38	19	19	0	0	0	0	0	0	0	36.2	7.0	-7.3
7	Mar-Jun	4	1	2	1	0	0	0	0	0	0	60.8	6,2	0 . 0

		Highest-productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% than e	Aft 3	% than e	Att 4	% than e	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	TEMP	25,0	SEDLD	16.7	CSTAB					
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	TEMP	25.0	HABD	16.7				
3	Ott-Mar	SEDLD	50.0	CSTAB	25.0	HABD	25.0	TEMP		FLOW	12.5	PATHO	12.5
3,4	Mar-May	FLOW	25,0	HABD	,25.0	PATHO	25.0	RIPCN		SEDLD	25.0	CSTAB	12.5
5	May-Ott	FLOW	24.4	HABD	24 A	PATH(7	24 .4	RIPCN					
6	Ott-Mar	FLOW	751-1	PATHO	25.0								
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that apawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook **Salmon** Life Histories

Stream: Miriam R.
Reach: **Little** Miriam R - splash dam site (1 m above **Garwood Cr**; RM 108.4 -119.7 from Snake R)

[Restoration benefit category:	E	**Chinook** usage score:	545.0	**Habitat** productivity ioss score:	-7.4

		No. **life** history pathways by current usage abundance **level**										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	14	0	2	12	0	14	0	2	12	0	13.6	-60.0	-5.2
1,2,3	Aug-Oct	20	0	0	20	0	20	0	0	20	0	10.7	-60.0	10.2
3	Oct-Mar	40	0	0	40	0	40	0	0	40	0	10.7	-60.0	-35.4
3,4	Mar-May	16	0	0	16	0	16	0	0	16	0	13.4	-60.0	-14.3
5	May-Oct	49	0	1	48	0	48	0	2	46	0	12.8	-59.7	52.6
6	Oct-Mar	19	0	0	19	0	0	0	0	0	0	26.7	0.0	-15.3
7	Mar-Jun	2	0	1	1	0	0	0	0	0	0	44.2	0.0	0.0

					rod								
	M M												
6	Oct-Mar	CSTAB	25.0	HABD	25.0	PATHO	25.0						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach **in** this table:

- **Level** 1: 0-10 spawners
- **Level** 2: 10-30 spawners
- **Level** 3: 30-60 spawners
- **Level 4:** **> 60** spawners

Life stages.' 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes:

- CHEM - **chemicals**
- **CSTAB** - **channel** stability
- COMP - competition (with other species)
- FLOW - ffow
- HABD - habitat diversity
- NUTLD - nutrient ioad
- OBST - obstructions
- OXYG - **dissolved oxygen**
- PATHO - pathogens
- PRED - predators (includes fishing-related **losses)**
- **RIPCN** - **riparian** condition
- SEDLD - sediment load
- TEMP - water temperature
- WiTH - water **withdrawals**

"NA indicates that no **life** history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no **additional** attributes with **negative** effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Splash dam site - falls (RM 119.7 -138.0 from Snake R)

Restoration benefit category:	E	**Chinook** usage score:	506.2	**Habitat** productivity loss score:	73.9

		No. life history pathways by current usage abundance level										Key habitat ch		Habitat productivity loss score
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no	1	2	3	4	quantity	% c	
1	Apr-Aug	12	0	12	0	0	12	0	12	0	0	10.0		4.7
1,2,3	Aug-Oct	20	0	20	0	0	20	0	20	0	0	8.4		26.3
3	Oct-Mar	40	0	40	0	0	40	0	40	0	0	8.6		0.0
3,4	Mar-May	16	0	16	0	0	16	0	16	0	0	10.4		18.7
5	May-Oct	49	0	49	0	0	46	0	46	0	0	9.8	0.0	19.6
6	Oct-Mar	19	0	19	0	0	0	0	0	0	0	21.6	0.0	4
7	Mar-Jun	1	0	1	0	0	0	0	0	0	0	35.8	0.0	0.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
123	Aug-Oct												
3	Oct-Mar	PATHO	12.5										
34	Mar-May	PATHO	17.2										
5	May-Oct	PATHO	25.0										
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the **natal** stream reaches that **populate** the life history pathways using the reach in this **table:**

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1- prespawner; 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- **overwintering;** 7- yearling **presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - **flow**
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment toad
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with **negative** effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Prairie Cr.
Reach: Mouth - OK Gulch confluence (RM 126.8 -131.8 from Snake R)

Restoration benefit category:	A	**Chinook** usage score:	582.9	**Habitat** productivity loss score:	-1047.5

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	7	7	0	0	0	49	49	0	0	0	3.3	221.5	28.3
1,2,3	Aug-Ott	10	10	0	0	0	70	70	0	0	0	2.3	78.6	-59.1
3	Ott-Mar	20	20	0	0	0	140	140	0	0	0	2.3	50.0	-686.3
34	Mar-May	8	8	0	0	0	3 6	36	0	0	0	2.9	50.8	-274.9
5	May-Ott	25	25	0	0	0	72	72	0	0	0	3.2	48.3	-57.2
6	Ott-Mar	19	19	0	0	0	0	0	0	0	0	2.3	50.0	3.1
7	Mar-Jun	2	2	0	0	0	0	0	0	0	0	9.1	165.3	0.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	CHEM	25.0	RIPCN	25.0	NUTLD	20.0	CSTAB	12.5		
1,2,3	Aug-Oct	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	RIPCN	25.0	NUTLD	12.5		
3	Oct-Mar	HABD	50.0	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0
3,4	Mar-May	HABD	50.0	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0
5	May-Oct	HABD	50.0	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	PATHO	25.0	RIPCN	25.0
6	Oct-Mar	COMP	25.0	HABD	25.0	PATHO	25.0	SEDLD	25.0				
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes Indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Prairie Cr.
Reach: OK Gulch fork (RM 131.8 -133.8 from Snake R)

Restoration benefit category:	E	**Chinook** usage score:	575.2	**Habitat** productivity loss score:	3253,1

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantity	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	n	42	42	0	0	0	0.3	########	520.3
1.2 3	Aug-Ott	10	10	0	0		70	70	0	0	0	1.1	########	694.0
3	Ott-Mar	20	20	0	0		140	140	0	0	0	1.6	4990.0	1002.5
34	Mar-May	8	8	0	0		32	32	0	0	0	1.8	83.3	116.3
5	May-Ott	25	25	0	0		69	69	0	0	0	1.9	-57.2	744.5
6	Ott-Mar	19	19	0	0		0	0	0	0	0	1.6	-64.1	166.6
7	Mar-Jun	1	1	1	n		0	0	0	0	0	6.1	37.5	8.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	NUTLD	250	PRED	25.0	RIPCN	25.0	SEDLD	25.0		
1,2,3	Aug-Oct	SEDLD	75.0	NUTLD	50.0	CSTAB	25.0	RIPCN	25,0	HABD	16.7	PRED	16.7
3	Ott-Mar	SEDLD	75.0	NUTLD	50,0	CSTAB	25,0	RIPCN	25.0	HABD	12.5	PATHO	125
3,4	Mar-May	HABD	50.0	SEDLD	50,0	CHEM	25.0	COMP	25,0	CSTAB	25.0	NUTLD	25.0
5	May-Ott	HABD	50,0	SEDLD	50,0	CHEM	25.0	COMP	25.0	CSTAB	25.0	PATHO	25.0
6	Oct-Mar	HABD	25.0	NUTLD	25.0	PAT HO	25.0	SEDLD	25.0				
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Levei 2: 10-30 spawners
Level 3: 30-60 spawners
Levei 4 > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization: 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Sheep Cr.
Reach: Mouth - Chicken Cr (RM 164.2 -165.7 from Snake R)

/Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	N??	N	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	N	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Aft 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	$
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA	
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook **Salmon** Life Histories

Stream: Sheep Cr.
Reach: Chicken Cr - headwaters (RM 165.7 -173.7 from Snake R)

Restoration benefit category: F	**Chinook** usage score: 0.0	**Habitat** productivity ioss score: 0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity ioss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Msr	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Levei 1: 0-10 spawners
Levei 2: 10-30 spawners
Level 3: 30-60 spawners
Levei 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ttOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Mouth - Miriam R (RM 80.0 -89.8 from Snake R)

Restoration benefit category	F	Chinook usage score:	185.2	Habitat productivity ioss score:	-51.4

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	ioss score
1	Apr-Aug	21	15	2	4	0	63	57	2	4	0	225	00	-310
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	1	1	0	0	0	41	36	1	4	o	15.0	-27.1	-43
6	Ott-Mar	19	0	0	19	0	132	131	1	0	0	41.9	0.0	-16.5
7	Mar-Jun	20	14	2	4	0	18	18	0	0	0	71.5	0.0	0.4

					ghest productivity impact attributes (% change in impact from template)								
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	11.9										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	COMP	11.3	HABD	11.3	PATHO	11.3						
6	Oct-Mar	FLOW	9.4	PATHO	9.4								
7	Mar-Jun												

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: **Wallowa** R.
Reach: Miriam R - Deer Cr (RM 89.8 -90.8 from Snake R)

Restoration benefit category:	F	**Chinook** usage score:	54.3	**Habitat** productivity loss score:	-31.4

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	15	13	0	2	0	57	55	0	2	0	9.0	-8.7	-21.3
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	37	35	0	2	0	8.3	-11.7	-1.8
6	Oct-Mar	0	0	0	0	0	9	9	0	0	0	8.3	-42.5	-8.5
7	Mar-Jun	15	13	0	2	0	11	11	0	0	0	30.3	-2.2	0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	8.7	PATHO	8.7	RIPCN	8.7						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	HABD	4.9	PATHO	4.9	RIPCN	4.9						
6	Oct-Mar	HABD	17.7	PATHO	17.7	RIPCN	17.7						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that apawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 **spawners**
Level 2 10-30 **spawners**
Level 3 30-60 spawners
Level 4 **> 60** spawners

Life ***stages:*** 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling **presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ffow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" Indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Deer Cr - Dry Cr (RM 90.8 -98.3 from Snake R)

Restoration benefit category:	D	Chinook usage score:	355.6	Habitat productivity loss score:	-183.7

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	15	13	0	2	0	57	55	0	2	0	10.5	-4.4	-6.7
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	7	7	0	0	0	37	37	0	0	0	3.7	-31.8	-44.3
5	May-Oct	50	50	0	0	0	268	266	0	2	0	8.8	-24.9	-46.3
6	Oct-Mar	75	56	0	19	0	39	39	0	0	0	8.3	-34.1	-64.6
7	Mar-Jun	15	13	0	2	0	11	11	0	0	0	33.0	-1.8	0.2 2

		Highest productivity impact attributes (% chang in impact from template)											
Life stage	Months	Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	8.8	PATHO	8.6	RIPCN	8.8						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
.3,4. ,.	Mar-May	HABD	25.0	PATHO	25.0	RIPCN	25.0	COMP	10.4	SEDLD	4.6		
5	May-Ott	HABD	200	COMP	10.0'	PATHO	1 0 . 0	RIPCN	10.0				
6	Ott-Mar	HABD	14.1	PATHO	14.1	PRED	14.1	RIPCN	14.1				
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Dry Cr - Bear Cr (RM 98.3 -101.8 from Snake R)

Restoration benefit category:	D	Chinook usage score:	199.8	Habitat productivity loss score:	-263.9

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	15	13	0	2	0	57	55	0	2	0	9.8	-12.1	-3.5
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	2	2	0	0	0	26	26	0	0	0	9.1	-63.7	-215.0
5	May-Ott	1	0	0	1	0	129	127	0	2	0	8.4	-50.0	-18.9
6	Ott-Mar	1	1	0	0	0	55	55	0	0	0	8.1	-323	-29.8
7	Mar-Jun	11	10	0	1	0	9	9	0	0	0	30.3	-3.5	1.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	At! 2	% change	Att 3	% change	Atf 4	% change	Art 5	% change	Att 6	% change
1	Apr-Aug	HABD	9.6	RIPCN	9.6	PATHO	4.8						
12,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	HABD	75,0	RIPCN	50.0	SEDLD	31.2	COMP	25.0	FLOW	25.0	PATHO	25.0
5	May-Ott	HABD	50.0	COMP	25.0	PATHO	25.0	RIPCN	25.0	SEDLD	17.0		
6	Ott-Mar	COMP	25.0	PATHO	25.0	WITH	25.0	HABD	20.5	SEDLD	20.5	RIPCN	10.2
7	Mar-Jun	COMP	5.7	PATHO	5.7	WITH	5.7						

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment iosd
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Bear Cr - Whiskey Cr (RM 101.8 -103.9 from Snake R)

Restoration benefit category:	F	Chinook usage score:	30.1	Habitat productivity loss score:	-33.6

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no,	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	13	11	0	2	0	43	41	0	2	0	9.8	-8.4	-5.8
1.2.3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	2	2	0	0	o	6	6	0	0	0	9.0	-32.3	-22.9
5	May-Oct	1	o	0	1	0	29	27	0	2	0	7.5	-9.2	-0.7
6	Ott-Mar	19	19	o	0	0	2	2	0	0	0	8.2	-12.9	-4.6
7	Mar-Jun	9	8	0	1	0	6	6	o	o	o	33.0	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Atf 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	6.7	RIPCN	6.7	PATHO	3.3	TEMP	3.3				
1.2.	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No	NA
3,4	Mar-May	HABD	34.5	RIPCN	23.0	FLOW	11.5	PATHO	11.5	WITH	11.5		
5	May-Ott	HABD	7 . 6	PATHO	3,8	RIPCN	3.8						
6	Ott-Mar	HABD	9 2	SEDLD	9,2	PATHO	4,6	RIPCN	4.6	COMP	3.1	WITH	3.1
7	Mar-Jun	COMP	2.8	PATHO	2.8	WITH	2.8						

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 8- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life **Histories**

Stream: **Wallowa** R.
Reach: Whiskey Cr - Lostine R (RM 103.9 -105.8 from Snake R)

Restoration benefit category: F	**Chinook** usage score: 27.2	Habitat productivity loss score: -29.1

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	13	11	0	2	0	43	41	0	2	0	9.0	-9.8	-2.3
1,2,3	Aug-Oct	NA NA	NA	NAA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	2	2	0	0	0	6	6	0	0	0	8.3	-30.7	-22.2
5	May-Oct	2	1	0	1	0	29	27	0	2	0	7.5	-7.2	-0.6
6	Ott-Mar	1	1	0	0	0	21	21	0	0	0	7 6	-11 5	-4.3
7	Mar-Jun	8	7	0	1	0	6	6	0	0	0	30.3	0.0	0 . 3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	7.8	RIPCN	7.8	PATHO	3.9						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	HABD	16.7	SEDLD	16.7	NUTLD	11.2	RIPCN	11.2	FLOW	5.6	OXYG	5.6
5	May-Oct	HABD	6.0	SEDLD	6.0	PATHO	3.0	RIPCN	3.0				
6	Oct-Mar	HABD	8.1	SEDLD	8.1	PATHO	4.0	RIPCN	4.0	COMP	3.1	WITH	3.1
7	Mar-Jun	COMP	2.1	PATHO	2.1	WITH	2.1						

Abundance *level* refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank ceils under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Lostine R - Parsnip Cr (RM 105.8 -109.0 from Snake R)

Restoration benefit category:	D	Chinook usage score:	240.3	Habitat productivity loss score:	-179.5

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no,	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	4	4	0	0	0	28	28	0	0	0	10.5	-27.2	-3.8
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34 *	Mar-May	4	4	0	0	o	12	12	0	0	0	9.2	-56.0	-113.4
5	May-Ott	25	25	0	0	0	88	88	0	0	0	6.6	-45.3	-16.1
6	Ott-Mar	19	19	0	0	0	20	20	0	0	0	8.3	-63.5	-47.1
7	Mar-Jun	4	4	0	0	0	5	5	0	0	0	33.0	7.8	0 . 8

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	24.1	RIPCN	24.1	PATHO	12.1						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	HABD	75.0	RIPCN	50.0	FLOW	25.0	PATHO	25.0	WITH	25.0		
5	May-Oct	HABD	44.0	PATHO	22.0	RIPCN	22.0						
6	Oct-Mar	HABD	48.8	SEDLD	48.8	COMP	25.0	PATHO	25.0	WITH	25.0	RIPCN	24.4
7	Mar-Jun	COMP	7.8	PATHO	7.8	WITH	7.8						

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawnera
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways wea present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Parsnip Cr - Hurricane Cr (RM 109.0 -121.9 from Snake R)

Restoration benefit category:	A	Chinook usage score:	495.3	Habitat productivity loss score:	-601,8

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	4	4	0	0	0	28	28	0	0	0	11.3	-48.5	-6.1
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	2	2	0	o	0	66	66	o	0	0	9.8	-64.5	
5	May-Ott	o	0	0	o	0	295	295	0	0	0	9.0	-63.3	
6	Ott-Mar	o	0	0	0	0	57	57	o	0	0	8.1	-76.1	-85.7
7	Mar-Jun	3	3	0	0	0	4	4	0	0	0	33.0	-5.8	1 , 3

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	39.4	RIPCN	39.4	PATHO	19.7						
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	HABD	75.0	RIPCN	50.0	SEDLD	37.5	FLOW	25.0	NUTLD	250	PATHO	25.0
5	May-Oct	HABD	50.0	SEDLD	36.7"	PATHO	25.0	RIPCN	25.0				
6	Oct-Mar	HABD	50.0	SEDLD	50.0	COMP	25.0	PATHO	25.0	RIPCN	25.0	WITH	25.0
7	Mar-Jun	COMP	15.8	PATHO	15.8	WITH	15.8						

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawnera
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Hurricane Cr - Lower Alderslope Ditch (RM 121.9 -126,8 from Snake R)

Restoration benefit category:	A	Chinook usage score:	595.5	Habitat productivity ioss score:	-1149,1

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	8	8	0	0	0	56	56	0	0	0	27.2	-7.5	-73.1
123	Aug-Ott	10	10	0	0	0	70	70	0	0	0	19.9	-24.5	-190.4
3	Ott-Mar	20	20	0	0	0	140	140	0	0	0	20,6	-29.1	-701.8
3 4	Mar-May	8	8	"o	0	0	40	40	0			23	15.2	-180.5
5	May-Ott	25	25	0	0	0	75	75	0			24	-7.1	10.2
6	Ott-Mar	19	19	0	0	0	0	0	0	0	0	8.3	-71.6	
7	Mar-Jun	3	3	0	0	0	0	0	0	0	0	33.0	0.0	

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	40.3	SEDLD	37.5	NUTLD	25.0	CHEM	20.2	HABD	20.2	OBST	20.2
1,2,3	Aug-Oct	SEDLD	75.0	FLOW	50.0	NUTLD	50.0	CHEM	25.0	HABD	25.0	OBST	25.0
3	Oct-Mar	SEDLD	75.0	NUTLD	50.0	FLOW	25.0	HABD	25.0	OXYG	25.0	PATHO	25.0
3,4	Mar-May	SEDLD	50.0	CHEM	25.0	HABD	25.0	NUTLD	25.0	PATHO	25.0	PRED	25.0
5	May-Oct	CHEM	24.3	PATHO	24.3	WITH	24.3						
6	Oct-Mar	FLOW	25.0	PATHO	25.0	SEDLD	25.0	WITH	25.0				
7	Mar-Jun	FLOW	14.4	WITH	14.4								

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Lower Alderslope Ditch - Wallowa Lake (RM 126.8 -130.8 from Snake R)

Restoration benefit category: F	Chinook usage score: 0.0	Habitat productivity loss score: 0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3 4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
8	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: Mouth - Crooked Cr (RM 45.1 -51.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	31.7	Habitat productivity loss score:	52.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	4	1	2	1	0	9	2	5	2	0	12.0	0.0	52.0
1,23	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	o	0	0	0	8	2	4	2	0	6.0	0.0	0.0
6	Oct-Mar	0	o	0	0	0	1	0	1	0	0	6.0	0.0	0.0
7	Mar-Jun	4	1	2	1	0	0	0	0	0	0	30.8	0.0	0.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	N A	NA	NA	N?	NA	N	NA	NA
5	May-Ott	PATHO	17.5										
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook **Salmon** Life Histories

Stream: Wenaha R.
Reach: Crooked **Cr** - Fairview **Cr** (RM 51.8 -55.3 from Snake R)

Restoration benefit category: E	**Chinook** usage score: 555.7	**Habitat** productivity ioss score: -22.4

		No. life history pathways by current usage abundance level										Key habitat change		**Habitat** productivity **loss** score
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	**quantity**	% change	
1	Apr-Aug	9	6	2	1	0	19	12	5	2	0	9.5	0.0	-364
123	Aug-Ott	10	10	0	0	0	20	20	0	0	0	6.9	0.0	-3.9
3	Ott-Mar	20	20	0	0	0	40	40	0	0	0	6.7	00	0.0
34	Mar-May	12	8	4	0	0	28	16	12	0	0	9.4	0.0	37.6
5	May-Ott	50	25	25	0	0	116	46	68	2	0	8.6	0.0	-22.4
6	Ott-Mar	38	18	40	0	0	0	0	0	0	0	6.8	0.0	0.0
7	Mar-Jun	4	1	2	1	0	0	0	0	0	0	30.8	0.0	2.7

		Highest productivity impact attributes (% change in impact from template)											
Life stage	**Months**	**Att 1**	**% change**	**Att 2**	**% change**	**Att 3**	**% change**	**Att 4**	**% change**	**Att 5**	**% change**	**Att 6**	**% change**
1	Apr-Aug	PRED	24.1										
1,2,3	Aug-Oct	PRED	16.7										
3	Oct-Mar	PATHO	12.5										
3,4	Mar-May	PATHO	19.1										
5	May-Oct	PATHO	24.8										
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the **natal** stream reaches that popuiate the iife history pathwaya using the reach in this table:

Level 1: 0-10 spawnera
Levei 2 10-30 spawners
Level **3**: 30-60 spawners
Levei **4**: **> 60** spawners

Life stages: 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- **yearling presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiow
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved **oxygen**
PATHO - pathogens
PRED - predators **(includes** fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

'NA" indicates that no **life** history pathway meeting the **criteria** used in defining these pathways was present.
Blank **cells** under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: Fairview Cr - forks (RM 55.3 -65.9 from Snake R)

Restoration benefit category:	E	Chinook usage score:	405.0	[Habitat productivity loss score:	-4.6

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	8	0	2	6	0	17	0	5	12	0	16.6	0.0	-5.2
1,2,3	Aug-Oct	10	0	0	10	0	20	0	0	20	0	8.7	0.0	-1.9
3	Oct-Mar	20	0	0	20	0	40	0	0	40	0	6.3	0.0	0.0
3,4	Mar-May	10	0	2	8	0	22	0	6	16	0	6.7	0.0	17.5
5	May-Oct	25	0	0	25	0	48	0	2	46	0	16.2	0.0	-17.6
6	Oct-Mar	19	0	0	19	0	0	0	0	0	0	15.8	0.0	0.0
7	Mar-Jun	2	0	1	1	0	0	0	0	0	0	24.2	0.0	2.6

Life stage	Months	Highest productivity impact attributes (% change in impact from $t_{em}pi_at_e$)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	PRED	20.5										
1,2,3	Aug-Oct	PRED	18.1										
3	Ott-Mar	PATHO	25.0										
3,4	Mar-May	HABD	25.0	PATHO	25.0								
5	May-Ott	HABD	25.0	PATHO	25.0								
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RiPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates thst no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: South Fork Wenaha R (RM 65.9 -72.4 from Snake R)

Restoration benefit category:	E	Chinook usage score:	577.0	Habitat productivity loss score:	18.9

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantity	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	12	0	12	0	0	30	0	30	0	0	3.1	0.5	0.0
1,2,3	Aug-Oct	20	0	20	0		50		5	0	0	2.6	0.0	26.2
3	Ott-Mar	40	0	40	0		100		11	0	0	2.8	0.0	-31.2
3,4	Mar-May	10	0	10	0	0	22	0	22	0	0	3.1	0.0	14.6
5	May-Ott	25	0	25	0	0	46	0	46	0	0	3.1	0.1	8.8
6	Ott-Mar	19	0	19	0	0	0	0	0	0	0	2.8	0.0	0.0
7	Mar-Jun	1	0	1	0	0	0	0	0	0	0	11.2	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PRED	25.0	TEMP	8.3								
1,2,3	Aug-Oct	TEMP	25.0	PRED	16.7								
3	Ott-Mar	TEMP	23.1										
3,4	MaryMay	TEMP	12.5										
5	May-Ott												
6	Ott-Mar												
7	Mar-Jun	CHEM	25.0										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmoit/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared 10 those present in the template.

APPENDIX E

Grande Ronde Stream **Reach** Summaries
for **Vacant** Life History Pathways

Reaches analyzed in the Grande Ronde, listed in the order they appear in Appendix E.

Stream	Reach	Benefit Category for Vacant Life History Pathways
Bear Cr.	Mouth - Chamberlain Ditch (RM 101.8 -104.7 from Snake R)	B
Bear Cr.	Chamberlain Ditch - Little Bear Cr (RM 104.7 -109.3 from Snake R)	F
Bear Cr.	Little Bear Cr - headwaters (RM 109.3-1 18.3 from Snake R)	F
Catherine Cr.	Mouth - 10th Street Bridge in Union (RM 114.5 -146.0 from Snake R)	F
Catherine Cr.	10th Street Bridge in Union - Little Catherine Cr (RM 146.0 -157.5 from Snake R)	A
Catherine Cr.	Little Catherine Cr - forks (RM 157.5 -164.4 from Snake R)	B
Catherine Cr.	South Fork Catherine Cr (RM 164.4 -166.8 from Snake R)	F
Grande Ronde R.	Mouth - Joseph Cr (RM 0.0- 3.7 from Snake R)	F
Grande Ronde R.	Joseph Cr - Buford Cr (RM 3.7- 26.2 from Snake R)	E
Grande Ronde R.	Buford Cr - Bear Cr (RM 26.2 -28.2 from Snake R)	E
Grande Ronde R.	Bear Cr - Menatchee Cr (RM 28.2 -34.8 from Snake R)	F
Grande Ronde R.	Menatchee Cr - Wenaha R (RM 34.8 -45.1 from Snake R)	E
Grande Ronde R.	Wenaha R - Courtney Cr (RM 45.1 -46.2 from Snake R)	B
Grande Ronde R.	Courtney Cr - Mud Cr(RM 46.2-51.4 from Snake R)	F
Grande Ronde R.	Mud Cr - Wallupa/Wildcat Cr (RM 51.4 -52.8 from Snake R)	F
Grande Ronde R.	Wallupa/Wildcat Cr - Grossman Cr (RM 52.8 -61.1 from Snake R)	F
Grande Ronde R.	Grossman Cr - Wallowa R (RM 61.1 -80.0 from Snake R)	B
Grande Ronde R.	Wallowa R - Lookingglass Cr (RM 80.0 -83.4 from Snake R)	A
Grande Ronde R.	Lookingglass Cr - Gordon Cr (RM 83.4 -94.2 from Snake R)	A
Grande Ronde R.	Gordon Cr - Phillips Cr (RM 94.2 -96.9 from Snake R)	A
Grande Ronde R.	Phillips Cr - Clark Cr (RM 96.9 -97.3 from Snake R)	B
Grande Ronde R.	Clark Cr - Indian Cr (RM 97.3 -99.3 from Snake R)	B
Grande Ronde R.	Indian Cr - Willow Cr (RM 99.3 -103.5 from Snake R)	B
Grande Ronde R.	Willow Cr - downstream end of State Ditch (RM 103.5 -114.5 from Snake R)	A
Grande Ronde R.	Downstream end of State Ditch - Upstream end of State Ditch (RM 114.5 -118.9 from Snake	A
Grande Ronde R.	Upstream end of State Ditch - I-84 crossing below Devil's Slide (RM 118.9 -128.4 from Snak	A
Grande Ronde R.	1-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 -133.4 from Snake R)	A
Grande Ronde R.	Five Points Cr - Rock Cr (RM 133.4 -133.8 from Snake R)	A
Grande Ronde R.	Rock Cr - Whiskey Cr (RM 133.8 -136.6 from Snake R)	A
Grande Ronde R.	Whiskey Cr - Jordan Cr (RM 136.6 -139.1 from Snake R)	A
Grande Ronde R.	Jordan Cr - Beaver Cr (RM 139.1 -145.8 from Snake R)	A
Grande Ronde R.	Beaver Cr - Meadow Cr (RM 145.8 -147.0 from Snake R)	D
Grande Ronde R.	Meadow Cr - Fly Cr (RM 147.0 -151.3 from Snake R)	D
Grande Ronde R.	Fly Cr - head of canyon 1.3 miles downstream of Sheep Cr (RM 151.3 -159.4 from Snake R)	B
Grande Ronde R.	Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 -164.2 from S	B
Grande Ronde R.	LimberJim Cr - Clear Cr (RM 164.2 -166.9 from Snake R)	D
Grande Ronde R.	Clear Cr - headwaiters (RM 166.9 -170.1 from Snake R)	F
Hurricane Cr.	Mouth - Lower Alderslope Ditch (RM 121.9 -124.9 from Snake R)	E

Reaches analyzed in the Grande Ronde, listed in the order they appear in Appendix E.

Stream	Reach	Benefit Category for Vacant Life History Pathways
Lostine R.	ClearWater Ditch - Cross Country Ditch (RM 108.3 -110.8 from Snake R)	F
Lostine R.	Cross Country Ditch - Sheep Ridge Dam (RM 110.8 -115.0 from Snake R)	B
Lostine R.	Sheep Ridge Dam - Silver Cr (RM 115.0 -120.0 from Snake R)	E
Lostine R.	Silver Cr - Lake Cr (RM 120.0 -124.6 from Snake R)	F
Lostine R.	Lake Cr - East Lostine R (RM 124.6 -131.7 from Snake R)	F
Miriam R.	Mouth - Cougar Cr (RM 89.8 -99.4 from Snake R)	B
Miriam R.	Cougar Cr - Little Miriam R (RM 99.4 -108.4 from Snake R)	D
Miriam R.	Little Miriam R - splash dam site (I m above Garwood Cr; RM 108.4 -119.7 from Snake R)	E
Miriam R.	Splash dam site - falls (RM 119.7 -138.0 from Snake R)	F
Prairie Cr.	Mouth - OK Gulch confluence (RM 126.8 -131.8 from Snake R)	F
Prairie Cr.	OK Gulch fork (RM 131.8 -133.8 from Snake R)	F
Sheep Cr.	Mouth - Chicken Cr (RM 164.2 -165.7 from Snake R)	B
Sheep Cr.	Chicken Cr - headwaters (RM 165.7 -173.7 from Snake R)	B
Wallowa R.	Mouth - Miriam R (RM 80.0 -89.8 from Snake R)	B
Wallowa R.	Miriam R - Deer Cr (RM 89.8 -90.8 from Snake R)	B
Wallowa R.	Deer Cr - Dry Cr (RM 90.8 -98.3 from Snake R)	B
Wallowa R.	Dry Cr - Bear Cr (RM 98.3 -101.8 from Snake R)	B
Wallowa R.	Bear Cr - Whiskey Cr (RM 101.8 -103.9 from Snake R)	B
Wallowa R.	Whiskey Cr - Lostine R (RM 103.9 -105.8 from Snake R)	B
Wallowa R.	Lostine R - Parsnip Cr (RM 105.8 -109.0 from Snake R)	B
Wallowa R.	Parsnip Cr - Hurricane Cr (RM 109.0 -121.9 from Snake R)	B
Wallowa R.	Hurricane Cr - Lower Alderslope Ditch (RM 121.9 -126.8 from Snake R)	F
Wallowa R.	Lower Alderslope Ditch - Wallowa Lake (RM 126.8 -130.8 from Snake R)	B
Wenaha R.	Mouth - Crooked Cr (RM 45.1 -51.8 from Snake R)	F
Wenaha R.	Crooked Cr -Fairview Cr(RM 51.8 -55.3 from Snake R)	F
Wenaha R.	Fairview Cr - forks (RM 55.3 -65.9 from Snake R)	F
Wenaha R.	South Fork Wenaha R (RM 65.9 -72.4 from Snake R)	F

Stream Reach Summary **for Vacant Spring Chinook Salmon Life Histories**

Stream: Bear Cr.
Reach: Mouth - Chamberlain Ditch (RM 101.8 -104.7 from Snake R)

Restoration benefit category:	**B**	**Chinook usage score:**	**48.3**	**Habitat productivity loss score:**	**-2185.7**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	56	56	0	0	0.8	-79.6	-528.0
1,2,3	Aug-Oct	90	90	0	0	0.1	-99.0	-845.6
3	Oct-Mar	180	180	0	0	0.0	-100.0	-59.7
3,4	Mar-May	44	44	0	0	2.8	-78.7	-27.9
5	May-Oct	94	94	0	0	0.0	-100.0	-664.5
6	Oct-Mar	19	19	0	0	2.4	-75.7	-61.1
7	Mar-Jun	1	1	0	0	13.8	-16.7	1.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	97.5	HABD	69.1	TEMP	48.7	WITH	47.4				
,.1,2,3	Aug-Ott	FLOW	100,0	HABD	50.0	TEMP	50.0	WITH	41.7				
3	Ott-Mar	FLOW	100.0	TEMP	50.0	WITH	25.0	CSTAB	12.5	HABD	12.5	PATHO	12.5
3,4	Mar-May,	FLO'	100.	HABD	500	PRED	50.0	WITH	50.0	PATHO	??!	TEM	25.0
5	May-Oct	FLOW	100.0	HABD	50.0	PRED	50.0	WITH	50.0	PATHO	25.0		
6	Ott-Mar	TEMP	50.0	HABD	25.0	PATHO	25.0						
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes; CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEOLD - sediment toad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Bear Cr.
Reach: Chamberlain Ditch - Little Bear Cr (RM 104.7 -109.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	4.0	Habitat productivity loss score:	4.7

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	7	7	0	0	5.4	7.8	0.0
1,2,3	Aug-Oct	10	10	0	0	2.7	-27.0	5.1
3	Oct-Mar	20	20	0	0	0.7	-83.2	0.0
3,4	Mar-May	3	3	0	0	2.8	-36.8	-0.4
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Art 2	% change	Att 3	% change	Art 4	% change	Art 5	% change	Att 6	% change
1	Apr-Aug	HABD	17.8										
1,2,3	Aug-Ott	HABD	18.1										
3	Oct-Mar	CSTAB	25.0	HABD	" 2 5 0 '	PATHO	25.0	RIPCN	25.0				
34	Mar-May	CSTAB	25.0	HABD	250	PATHO	25.0	RIPCN	25.0				
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Bear Cr.
Reach: Little Bear Cr - headwaters (RM 109.3 -118.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	4.8	Habitat productivity loss score:	8.7

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	3.8	0.0	1.2
1,2,3	Aug-Ott	10	10	0	0	3.4	0.0	6.6
3	Ott-Mar	20	20	0	0	3.5	0.0	0.0
3,4	Mar-May	2	2	0	0	3.9	0.0	0.9
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	22.2										
1,2,3	Aug-Oct	HABD	8.3										
3	Oct-Mar	PATHO	12.5										
3,4	Mar-May	PATHO	12.5										
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Chesnimnus Cr.
Reach: Confluence with Crow Cr - South Fork (RM 52.7 -77.7 from Snake R)

[Restoration benefit category: F .	Chinook usage score: 0.0	Habitat productivity loss score: 0.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months				ighest productivity impact attributes (% change in impact from template)								
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Catherine Cr.**
Reach: **Mouth - 10th Street Bridge** in Union (RM 114.5 -146.0 from Snake R)

Restoration benefit category:	A	Chinook usage score:	158.0	Habitat productivity loss score:	-4576.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	84	1	74	9	8.6	-77.4	-486.3
1,2,3	Aug-Oct	90	0	80	10	1.0	-75.6	-428.4
3	Oct-Mar	180	0	160	20	0.7	-82.8	-820.4
3,4	Mar-May	101	0	88	13	6.5	-76.5	-789.8
5	May-Oct	352	1	311	40	1.1	-95.7	-1806.0
6	Oct-Mar	76	0	76	0	4.3	-72.0	-252.4
7	Mar-Jun	5	0	5	0	26.2	-3.3	7.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	62.5	TEMP	62.5	RIPCN	50.0	HABD	49.7	CSTAB	25.0	SEDLD	25.0
1,2,3	Aug-Oct	TEMP	100.0	FLOW	75.0	HABD	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0
3	Oct-Mar	TEMP	100.0	FLOW	75.0	HABD	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0
3,4	Mar-May	TEMP	100.0	FLOW	75.0	HABD	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0
5	May-Oct	HABD	75.0	SEDLD	75.0	FLOW	74.9	RIPCN	50.0	COMP	25.0	OBST	25.0
6	Oct-Mar	HABD	75.0	SEDLD	75.0	FLOW	50.0	RIPCN	50.0	COMP	25.0	OBST	25.0
7	Mar-Jun	OBST	25.0	WITH	25.0								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
oBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: 10th Street Bridge in Union - Little Catherine Cr (RM 146.0 -157.5 from Snake R)

Restoration benefit category:	B	Chinook usage score:	78.7	Habitat productivity loss score:	-1986.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	56	1	49	6	4.8	-59.2	-246.4
1,2,3	Aug-Oct	90	0	80	10	3.0	-58.2	-765.8
3	Oct-Mar	180	0	160	20	3.4	-55.9	-398.5
3,4	Mar-May	54	5	46	3	5.9	-53.4	-275.1
5	May-Oct	114	20	94	o	5.1	-	-242.8
6	Oct-Mar	19	0	19	0	3.4	-	-58.1
7	Mar-Jun	1	0	1	0	18.9	17.6	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	TEMP	75.0	FLOW	50.0	RIPCN	50.0	HABD	48.9	OBST	48.9	SEDLD	16.7
,123	Aug-Ott	TEMP	75.0	FLOW	50.0	RIPCN	50,0	SEDLD	50.0	CSTAB	25.0	HABD	25.0
3	Ott-Mar	TEMP	75.0	"FLOW	"' 50.0"	RIPCN	50'0	SEDLD	50.0'	"' CSTAB	"37.5	HABD	25.0
34	Mar-May	TEMP	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	WITH	50.0	CSTAB	37.5
5	May-Ott	TEMP	75.0	FLOW	50.0	HABD	50,0	RIPCN	50.0	WITH	500	PATHO	25.0
6	Ott-Mar	HABD	50.0	RIPCN	50.0	SEDLD	50,0	CSTAB	25.0	PATHO	25.0	WITH	25.0
7	Mar-Jun	WITH	25.0										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: Little Catherine Cr - forks (RM 157.5 -164.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	7.3	Habitat productivity loss score:	-47.7

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	7	1	6	0	4.9	-54.3	-8.7
1,2,3	Aug-Ott	10	0	10	0	6.3	-180	-177
3	Ott-Mar	20	0	20	0	8.3	-3.6	-18.1
34	Mar-May	3	1	2	0	7.9	-30.0	-3.2
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	SEDLD	25.0	TEMP	25.0	HABD	20.8	CSTAB	12.5				
1,2,3	Aug-Ott	SEDLD	50.0	CSTAB	25.0	HABD	25.0	TEMP	25,0				
3	Oct-Mar	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25.0		
34	Mar-May	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25,0		
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

- Level 1: Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Catherine Cr.
Reach: **South Fork Catherine Cr (RM 164.4 -166.8 from Snake R)**

Restoration benefit category:	F	Chinook usage score:	3.8	Habitat productivity loss score:	-42.4

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	3.0	0.0	-5.4
1,2,3	Aug-Oct	10	10	0	0	2.0	0.0	-12.4
3	Oct-Mar	20	20	0	0	2.0	0.0	-20.9
3,4	Mar-May	2	2	0	0	3.0	0.0	-3.7
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attribute: Att 1	% change	Att 2	% change	Att 3	% change	% change in impact from template: Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	16.7	TEMP	8.3						
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0	TEMP	25.0						
3	Oct-Mar	SEDLD	50.0	FLOW	25.0	TEMP	25.0	CSTAB	12.5	PATHO	12.5		
3,4	Mar-May	FLOW	25.0	SEDLD	25.0	CSTAB	12.5	PATHO	12.5	TEMP	12.5		
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated **relative** abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using **the** reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling**presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - **flow**
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Mouth - Joseph Cr (RM 0.0- 3.7 from Snake R)

Restoration benefit category:	E	Chinook usage score:	65.4	Habitat productivity loss score:	-11.2

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity! loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	710	426	236	48	338	0.0	0.0
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	Ott-Msr	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	76	19	48	9	20.6	0.0	-183
6	Ott-Mar	NA	NA	N/	NA	NA	%	NA
7	Mar-Jun	562	383	14	31	109.8		7.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Atf 2	% change	Art 3	% change	Att 4	% change	Art 5	% change	Att 6	% change
1	Apr-Aug	CHEM	12.5	NUTLD	125	OXYG	12.5						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	A	NA	NA	NA	NA	NA	NA	NA	!!?!
5	May-Ott	COMP	6.6	HABD	3.3	NUTLD	3 . 3	PATHO	3,3				
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	PATHO	6.2	TEMP	6.2								

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to averaga (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Grande Ronde R.**
Reach: Joseph Cr - Buford Cr (RM 3.7- 26.2 from Snake R)

Restoration benefit category:	E	**Chinook** usage score:	91.1	Habitat productivity loss score:	-167.3

Life staga	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	571	342	190	39	33.8	10.1	00
1 2 3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	57	16	34	7	20.6	0.0	-33.6
6	Ott-Mar	700	514	167	19	23.5	01	-1388
7	Mar-Jun	543	364	150	29	117.7	2.1	5.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Att 6	% change
1	Apr-Aug	CHEM	20.3	NUTLD	203	OXYG	20.3						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	SEDLD	28.1	COMP	15.5	PATHO	14.0	CHEM	78	HABD	78	NUTLD	7.8
6	Ott-Mar	SEDLD	9.6	PATHO	7.1	TEMP	7.1						
7	Mar-Jun	PATHO	4.7	TEMP	4.7								

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: **Buford Cr - Bear Cr (RM 26.2 -28,2** from Snake R)

Restoration benefit category:	**F**	**Chinook usage score:**	**26.7**	**Habitat productivity loss score.**	**-59.9**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	355	213	118	24	33.8	0.0	0.0
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	60	19	34	7	20.6	0.0	-367
6	Ott-Mar	106	60	26	20	225	0.0	-268
7	Mar-Jun	262	170	76	16	107 5	0.0	3 6

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	An 5	% change	Att 6	% change
1	Apr-Aug	CHEM	6.2	NUTLD	6.2	OXYG	6.2						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	N'A	N A	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	COMP	15.4	CHEM	7.7	HABD	7.7	NUTLD	7.7	PATHO	7 7		
6	Ott-Mar	SEDLD	12.9	PATHO	6.5	TEMP	3.1						
7	Mar-Jun	PATHO	6.9	TEMP	69								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Bear Cr - Menatchee Cr (RM 28.2 -34.8 from Snake R)

Restoration benefit category:	E	Chinook usage score:	43.3	Habitat productivity loss score:	-57.3

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	355	213	118	24	33.7	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	69	27	35	7	20.6	0.0	-24.2
6	Oct-Mar	266	202	62	2	23.0	0.2	-35.4
7	Mar-Jun	258	168	75	15	106.1	0.0	2.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Art 6	% change
1	Apr-Aug	CHEM	17,4	NUTLD	17.4	OXYG	17.4						
,1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA "	NA	NA	NA	NA	NA	NA"	NA	N A	"'NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	SEDLD	11.1	COMP	6.5	PATHO	56	CHEM	3.3	HABD	3.3	NUTLD	3.3
6	Ott-Mar	SEDLD	6.6	PATHO	3.3	TEMP	31						
7	Mar-Jun	PATHO	4.6	TEMP	4.6								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5. summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Menatchee Cr - Wenaha R (RM 34.8 -45.1 from Snake R)

Restoration benefit category:	B	Chinook usage score:	53.2	Habitat productivity loss score:	-400.7

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	359	217	118	24	34.5	00	00.
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	20	20	0	0	347	0.0	-422
5	May-Ott	175	128	40	7	219	0.0	-2745
6	Ott-Mar	518	346	152	20	241	0.0	-869
7	Mar-Jun	250	162	73	15	118.3	0.0	2.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	11.6	NUTLD	11.6	OXYG	11.6						
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3"	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	N A	N A	NA	NA
3,4	Mar-May	COMP	500	CHEM	25.0	FLOW	25.0	HABD	250	NUTLD	25.0	PATHO	25.0
5	May-Ott	COMP	31.7	CHEM	15,8	HABD	15.8	NUTLD	15.8	PATHO	15.8		
6	Ott-Mar	SEDLD	8.4	PATHO	4.2	TEMP	3.1						
7	Mar-Jun	PATHO	5.7	TEMP	5.7								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearting presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Wenaha R - Courtney Cr **(RM 45.1 -46.2 from Snake R)**

Restoration benefit category	F	Chinook usage score:	20.9	Habitat productivity loss score:	-60.7

Liie stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	347	209	114	24	39.8	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	82	38	37	7	71.3	0.0	-46.4
6	Oct-Mar	103	86	14	3	29.5	0.0	-16.4
7	Mar-Jun	217	140	63	14	138.0	0.0	2.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Aft 2	% change	Att 3	% change	Aft 4	% change	Aft 5	% change	Att 6	% change
1	Apr-Aug	CHEM	6.0	NUTLD		OXYG	6.0	TEMP	6.0				
.1,2,3,	Aug-Ott	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	N A	NA	NA	N A	N A	N A	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	SEDLD	10.4	COMP	8.1	HABD	5.2	PATHO	5 . 2	CHEM	4.0	NUTLD	4!?
6	Ott-Mar	SEDLD	10.3	HABD	5.1	PATHO	5.1	TEMP	3.1				
7	Mar-Jun	TEMP	4.8										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Courtney Cr - Mud Cr (RM 46.2 -51.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	20.7	Habitat productivity loss score:	-54.7

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	347	209	114	24	33.3	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	94	47	39	8	60.0	0.0	-34.8
6	Oct-Mar	203	115	67	21	25.3	0.0	-21.6
7	Mar-Jun	214	137	63	14	114.2	0.0	1.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Atf 2	% change	Atf 3	% change	Att 4	% change	Art 5	% change	Atf 6	% change
1	Apr-Aug	CHEM	6.1	NUTLD	6.1	OXYG	6.1	TEMP	6.1				
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA"	' N A '
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	fday-Ott	COMP	7.1	CHEM	3.6	NUTLD	3.6	PATHO	3.6	TEMP	3.6		
6	Ott-Mar	SEDLD	6.9	HABD	3.4	PATHO	3.4	TEMP	3.1				
7	Mar-Jun	PATHO	3.9	TEMP	3.9								

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Levei 1: Low to average (relative to other reaches) abundance
Levei 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance.

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Mud Cr - Wallupa/Wildcat Cr (RM 51.4 -52.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	25.0	Habitat productivity loss score	-61.8

1

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	347	209	114	24	24.1	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	99	50	40	9	46.9	0.0	-46.9
6	Oct-Mar	134	99	14	21	20.0	0.0	-16.7
7	Mar-Jun	205	132	60	13	89.4	0.0	1.8

Liie stage	Months	Highest productivity impact attributes (% change in impact from template): Art 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	8.7	NUTLD	8.7	OXYG	87	TEMP	8.7				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
"'3'	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
-.3,4,,	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
5	May-Ott	SEDLD	10.3	COMP	6.0	TEMP	6.0	HABD	5.2	PATHO	5.2	CHEM	
6	Ott-Mar	SEDLD	8.0	HABD	4.0	PATHO	4.0						
7	Mar-Jun	PATHO	4.3	TEMP	4.3								

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: **Wallupa/Wildcat Cr - Grossman** Cr (RM 52.8 -61.1 from Snake R)

[Restoration benefit category:	**B**	**Chinook usage score:**	**88.8**	**Habitat productivity loss score:**	**-322.8**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	**Apr-Aug**	347	209	114	24	22.8	0.0	00
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	**Oct-Mar**	**NA**	NA	NA	NA	**NA**	**NA**	**NA**
34	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	121	63	49	9	47.5	0.0	-107.0
6	Ott-Mar	459	339	99	21	207	-00	-219.4
7	**Mar-Jun**	200	128	60	12	90.5	0.0	3.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Aft 5	% change	Att 6	% change
1	**Apr-Aug**	CHEM	22.8	NUTLD	22.8	OXYG	22.8	TEMP	22.8				
1,2,3	Aug-Ott	**NA**	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	" N A "	" N A "	**NA**	**NA**	**NA**	NA	**NA**	**NA**	**NA**	NA	**NA**	**NA**
3,4	Mar-May	NA	NA	NA	NA	**NA**	**NA**	**NA**	NA	**NA**	**NA**	**NA**	**NA**
5	May-Ott	COMP	16.0	TEMP	16.0	CHEM	8.0	**NUTLD**	8.0	PATHO	**8.0**		
6	**Oct-Mar**	SEDLD	30.7	HABD	15.3	PATHO	15.3	TEMP	**15.1**				
7	**Mar-Jun**	PATHO	8.7	**TEMP**	**8.7**								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: **Low** to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level **3**: Exceptionally high (relative to other reaches) abundance

Life stages: 1- **prespawner**; 2- **spawner**; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling**presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no **life** history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Grande Ronde R.**
Reach: **Grossman Cr - Wallowa** R (RM 61.1 -80.0 from Snake R)

Restoration benefit category:	A	Chinook usage score:	221.2	Habitat productivity loss score:	-3222.1

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	496	303	154	39	?	0.0	0.0
1,2,3	Aug-Ott	NA	NA	NA	NA		NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	150	124	26	0	33.9	0.0	-347.2
5	May-Oct	902	699	191	12	58.3	0.0	-2181.6
6	Ott-Mar	1038	641	339	58	22.0	0.0	-697.2"
7	Mar-Jun	190	120	58	12	106.2	0.0	3.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CHEM	21.5	NUTLD	21.5	OXYG	21.5	TEMP	21.5				
1,2,3	Aug-Ott	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	COMP	37.7	TEMP	37.7	FLOW	25.0	PATHO	25.0	SEDLD	20.2	CHEM	18.8
5	May-Ott	COMP	36.2	TEMP	36.2	SEDLD	27.2	CHEM	18.1	NUTLD	18.1	PATHO	18.1
6	Ott-Mar	SEDLD	25.3	PATHO	19.0	TEMP	19.0	HABD	12.6				
7	Mar-Jun	PATHO	10.2	TEMP	10.2								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways usino the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Wallowa R - Lookingglass Cr (RM 80.0 -83.4 from Snake R)

Restoration benefit category:	A	Chinook usage score:	84.3	Habitat productivity loss score:	-3216.6

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	228	152	68	8	26.1	-4.1	-516.4
1,2,3	Aug-Oct	80	70	10	0	7.6	-37.5	-487.8
3	Oct-Mar	160	140	20	0	12.7	-5.2	-672.9
3,4	Mar-May	108	90	18	0	33.3	0.0	-105.7
5	May-Oct	497	407	86	4	16.8	-10.8	-1353.9
6	Oct-Mar	149	108	23	18	12.4	-3.0	-110.1
7	Mar-Jun	82	54	24	4	84.0	0.0	30.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	50.0	HABD	37.5	NUTLD	37.5	CHEM	25.0	FLOW	25.0	OXYG	25.0
1,2,3	Aug-Oct	NUTLD	50.0	SEDLD	50.0	TEMP	50.0	HABD	37.5	CHEM	25.0	CSTAB	25.0
3	Oct-Mar	NUTLD	50.0	SEDLD	50.0	TEMP	50.0	CHEM	25.0	CSTAB	25.0	FLOW	25.0
3,4	Mar-May	TEMP	26.9	FLOW	25.0	NUTLD	25.0	SEDLD	25.0	PATHO	18.7	COMP	13.5
5	May-Oct	TEMP	26.0	COMP	13.0	FLOW	13.0	HABD	13.0	PATHO	13.0		
6	Oct-Mar	SEDLD	19.9	TEMP	10.4	CSTAB	10.0	HABD	10.0	PATHO	10.0	RIPCN	10.0
7	Mar-Jun	TEMP	6.3										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: **Lookingglass Cr - Gordon Cr** (RM 83.4 -94.2 from Snake R)

Restoration benefit category:	A	Chinook usage score:	105.2	Habitat productivity loss score:	-3571.4

Life stage	Months	No. vacant life history pathways by abundance level: Total no,	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	216	106	102	8	12.3	2.1	-575.0
123	Aug-Ott	80	0	80	0	6.5	0.0	-410.1
3	Ott-Mar	160	0	160	0	7.9	0.0	-716.1
34	Mar-May	104	41	63	0	15.2	4.3	-276.6
5	May-Ott	386	150	232	4	9.7	1.4	-1482.3
6	Ott-Mar	303	189	113	1	8.0	0.0	-133.0
7	Mar-Jun	75	49	23	3	44.5	0.0	21.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	50.0	HABD	50.0	NUTLD	50.0	RIPCN	50.0	TEMP	37.5	CHEM	25.0
1,2,3	Aug-Oct	FLOW	50.0	HABD	50.0	NUTLD	50.0	RIPCN	50.0	SEDLD	50.0	TEMP	50.0
3	Oct-Mar	NUTLD	50.0	SEDLD	50.0	TEMP	50.0	FLOW	37.5	CHEM	25.0	OXYG	25.0
3,4	Mar-May	FLOW	51.5	TEMP	51.5	NUTLD	34.4	RIPCN	34.4	SEDLD	21.5	CHEM	17.2
5	May-Oct	FLOW	49.4	TEMP	49.4	NUTLD	32.9	RIPCN	32.9	SEDLD	17.1	CHEM	16.5
6	Oct-Mar	SEDLD	12.0	FLOW	6.0	HABD	6.0	PATHO	6.0	TEMP	6.0		
7	Mar-Jun	TEMP	5.0										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: **Gordon Cr - Phillips Cr (RM 94.2 -96.9** from Snake R)

Restoration benefit category:	B	**Chinook usage score:**	59.4	**Habitat productivity loss score:**	-2759.4

		No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity
		-- '-' 10.	1	2	3	Patient quantity	% chang	
		90	146	59	8	16.4	-21.2	
	M			20				05
	M M							
	M		29					
	M							26
	M							

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	62,5	NUTLD	50.0	FLOW	37,5	CHEM	25.0	HABD	25.0	OXYG	25.0
1,2,3	Aug-Ott	TEMP	75.0	FLOW	50.0	HABD	50.0	NUTLD	50.0	RIPCN	50,0	SEDLD	50.0
'3""	Ott-Mar	NUTLD	50;0'	SEDLD	50.0	TEMP	5 0 . 0	CHEM	25.0	"FLOW"	25.0	OXYG	2 5 . 0
34	Mar-May	FLOW	75.0	TEMP	75.0	HABD	50.0	NUTLD	50.0	RIPCN	g:; ,..	SEDLD	45.7
5	May-Ott	FLOW	52.7	TEMP	52.7	HABD	35.2	NUTLD	35.2	RIPCN		CHEM	176
6	Ott-Mar	HABD	9.3	PATHO	9.3	SEDLD	9.3	TEMP	9.3				
7	Mar-Jun	TEMP	5.0										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

***Life* stages:** 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Phillips Cr - Clark Cr (RM 96.9 -97.3 from Snake R)

Restoration benefit category:	B	Chinook usage score:	53.3	Habitat productivity loss score:	-2836.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	204	138	58	8	12.6	-20.7	-517.9
12	Aug-Oct	90	80	10	0	5.9	-61.1	-548.9
3	Ott-Mar	180	160	20	0	6 . . 7	-59.5	-982.3
34	Mar-May	57	49	8	0	12.2	-40.6	-159.0
5	May-Ott	155	126	25	4	20.2	-3.2	-619.5
6	Ott-Mar	39	34	4	1	6.0	-32.8	-16.7
7	Mar-Jun	55	35	17	3	35.5	3.7	7.9

		M		W								M	
				W							50		50
	M									W			
	M	W									50		
	M	W										M	
		M											

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Clark Cr - Indian Cr (RM 97.3 -99.3 from Snake R)

Restoration benefit category:	B	Chinook usage score:	55.9	Habitat productivity loss score:	-2716.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	195	[illegible]	57	8	11.7	-26.1	-579.4
1,2,3	Aug-Oct	90	80	10	0	6.0	-62.9	-548.9
3	Oct-Mar	180	160	20	0	7.5	-57.5	-805.6
3,4	Mar-May	52	45	7	0	14.1	-49.2	-140.5
5	May-Oct	156	124	9 7	5	19.8	-3.0	-620.0
6	Oct-Mar	71	69	2	0	7.1	-20.2	-29.0
7	Mar-Jun	54	34	17	3	46.4	0.9	7.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Atf 1	% change	Att 2	% change	An 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	62.5	NUTLD	50.0	FLOW	37.5	CHEM	25.0	HABD	25.0	OXYG	25.0
,,,1,,2,3,,,	Aug-Ott	TEMP	.,75.0	FLOW	50.0	HABD	50.0	NUTLD	50.0	RIPCN	50.0	SEDLD	50.0
3	Ott-Mar	NUTLD	50.0	SEDLD	50,0	"TE"MP"	"50.0	CHEM	25.0	FLOW	25.	OXYG	25.
3.4	Mar-May	FLOW	75.	TEMP	75.0	HABD	50.0	RIPCN	50.0	NUTLD	37.	SEDLD	37.
5	May-Ott	FLOW	47.5	TEMP	47.5	HABD	31:7	RIPCN	3 1 . 7	CHEM	15.8	COMP	15.8
6	Ott-Mar	TEMP	10.4	CSTAB	8.6	HABD	8.6	PATHO	8.6	RIPCN	8.6	SEDLD	8.6
7	Mar-Jun	TEMP	2.4										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Indian Cr - Willow Cr (RM 99.3 -103.5 from Snake R)

Restoration benefit category:	A	Chinook usage score:	79.3	Habitat productivity loss score:	-3877.5

Liie stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	186	127	51	%		-37	-688.6
1,2,3	Aug-Ott	90	90	0	0		-61	-548.9
3	Ott-Mar	180	180	0	0	70	-63.4	-982.3
34	Mar-May	67	58	9	0	14.7	-59.3	%.??
5	May-Ott	272	219	48		219	5	-1382.0
6	Ott-Mar	120	102	18				-69.8
7	Mar-Jun	51	31	17	3	46.2	-0.7	13.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	TEMP	44.8	FLOW	29.8	HABD	29.8	NUTLD	29.8	RIPCN	29.8	CHEM	14.9
,1,2,3	Aug-Ott	TEMP	75.0	FLOW	50.0	HABD	50.0	NUTLD	50.0	RIPCN	50.0	SEDLD	50.0
3	Oct-Mar	NUTLD	56.0	SEDLD	50.0	TEMP	50.0	CHEM	25.0	CSTAB	25.0	FLOW	25.0
34	Mar-May	FLOW	75.0	TEMP	75.0	HABD	5	RIPCN	50.0	CHEM	25.0	COMP	25.0
5	May-Ott	FLOW	69.5	TEMP	69.5	HABD	4	RIPCN	46.3	CHEM	23.2	COMP	23.2
6	Ott-Mar	HABD	14.1	PATHO	14.1	RIPCN	14.1	SEDLD	14.1	TEMP	14.1		
7	Mar-Jun	TEMP	4.5										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages; 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: Downstream end of State Ditch - Upstream end of State Ditch (RM 114.5 -118.9 from Snake R)

Restoration benefit category:	A	Chinook usage score:	105.1	Habitat productivity loss score:	-6018.7

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	148	112	30	6	10.5	-51.2	-524.4
1,2,3	Aug-Oct	90	80	10	0	2.5	-75.7	-505.4
3	Oct-Mar	180	160	20	0	0.0	-100.0	-1418.2
3,4	Mar-May	87	60	19	8	1.5	-97.3	-651.0
5	May-Oct	372	220	104	48	9.5	-64.4	-2551.3
6	Oct-Mar	97	58	20	19	1.5	-61.6	-377.0
7	Mar-Jun	29	24	3	2	36.3	-10.5	8.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	75.0	TEMP	625	FLOW	50.0	RIPCN	28.1	CHEM	25.0	NUTLD	250
1 , 2 , 3	Aug-Ott	RIPCN	100.0	HABD	75.0	SEDLD	75.0	TEMP	62.5	FLOW	50.0	CHEM	25.0
3	Ott-Mar	RIPCN	100.0	SEDLD	75.0	CSTAB	37.5	FLOW	37.5	HABD	"37.5	PATHO	" 12.5
,,,,,,,,3,4,,,,,	Mar-May	RIPCN	87.5	FLOW	75.0	HABD	75.0	CHEM	50.0	NUTLD	50.0	OXYG	50.0
5	May-Ott	FLOW	72.9	HABD	72.9	RIPCN	72.9	CHEM	48.6	NUTLD	48.6	OXYG	48.6
6	Ott-Mar	FLOW	49.4	HABD	.,.49.4,	RIPCN	49.4	S EDLD	49.4	CHEM	16.5	PATHO	16.5
7	Mar-Jun	HABD	7.4										

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Upstream end of State Ditch - i-84 crossing below Devil's Siide (RM 118.9 -128.4 from Snake R)

Restoration benefit category:	A	Chinook usage score:	130.8	Habitat productivity ioss score:	-6524.6

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	139	104	29	6	2.3	-62.5	-593.5
1,2,3	Aug-Oct	90	80	10	0	1.1	-90.8	-546.8
3	Oct-Mar	180	160	20	0	1.7	-81.4	-995.7
3,4	Mar-May	127	95	28	4	3.1	-94.1	-903.2
5	May-Oct	476	377	96	3	27.2	-25.2	-3083.6
6	Oct-Mar	151	151	0	0	10.7	-37.5	-401.6
7	Mar-Jun	24	21	2	1	63.1	0.0	-0.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Art 1	% change	Art 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	75.0	TEMP	62.5	HA	47.4	SEI	37.	RIPCN	31.6	CSTAB	25.0
123	Aug-Oct	FLOW	75.0	HABD	75.0	SEDLD	75.0	TE	75.	CSTAB	50,0	RIPCN	50.0
3	Oct-Mar	FLOW	75.0	HABD	75.0	SEDLD	75.0	CSTAB	'50.0	RIPCN	50.0''	TEMP	50.0
3.4	Mar-May	FLOW	75.0	HABD	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0	OXYG	50.0
5	May-Ott	FLOW	70.4	TEMP	70.4	HABD	47.0	OXYG	47.0	RIPCN	47.0	CHEM	23.5
6	Ott-Mar	FLOW	51.1	HABD	34.1	OBST	34.1	RIPCN	34.1	SEDLD	34.1	CHEM	17.0
7	Mar-Jun	WiTH	8.7										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PR ED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: 1-84 crossing below Devil's Slide - Five Points Cr (RM 128.4 -133.4 from Snake R)

Restoration benefit category:	**A**	**Chinook usage score:**	**106.9**	**Habitat productivity loss score:**	**-3789.0**

Life stage	Months	No, vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	130	56	38	36	3.0	-47.8	-548.4
1,2,3	Aug-Ott	90	0	30	60	6.5	-46.7	-710.4
3	Ott-Mar	180	0	60	120	11.5	0.0	-1156.0
3 4	Mar-May	77	21	20	36	8.8	-55.7	-480.2
5	May-Ott	243	70	79	94	14.7	-28.8	-805.9
6	Ott-Mar	58	20	19	19	1.9	-40.3	-89.7
7	Mar-Jun	16	13	2	1	69.3	0.0	1.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	At! 2	% change	Att 3	% change	Att 4	% change	At! 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75	TEMP	75	HABD	62.5	- H A B D -	625				
1,2,3	Aug-Oct	RIPCN	75	SEDLD	75	TEMP	75.0			CSTAB	50,0		
3 "	Ott-Mar	SEDLD	75.0	TEMP "	75.0	CSTAB	5 0 . 0	FLOW	25.0	HABD	25.0	RIPCN	25.0
3,4	Mar-May	RIPCN	38.5	TEMP	38.5	CSTAB	33.7	SEDLD	33.7	HABD	25.7	FLOW	225
5	May-Odt	RIPCN	38.0	TEMP	38.0	HABD	25.3	CSTAB	1 5 . 4	SEDLD	15.4	PATHO	12.7
6	Ott-Mar	CSTAB	21.6	HABD	21.6	RIPCN	21.6	SEDLD	21.6	PATHO	10.8	TEMP	10.8
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life ***stages:*** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attribute with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Grande Ronde R.**
Reach: **Five Points** Cr - Rock Cr (RM 133.4 -133.8 from Snake R)

Restoration benefit category:	**A**	**Chinook usage score:**	**60.3**	**Habitat productivity loss score:**	**-3532.7**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	121	86	35	0	2.1	-46.7	-496.9
123	Aug-Ott	90	60	30	0	5.1	-46.7	-710.4
3	Ott-Mar	180	120	60	0	10.8	0.0	-1156.0
3.4	Mar-May	62	37	25	0	8.1	-59.7	-414.5
5	May-Ott	126	68	58	0	10.2	-46.5	-683.6
6	Ott-Mar	22	3	19	0	1.7	-85,6	-72.3
7	Mar-Jun	13	12	1	0	49.5	0.0	1.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	75.0	RIPCN	37.5	SEDLD	37.5	HABD	34.5	CSTAB	25.0		
1,2,3	Aug-Ott	HABD	75.0	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0		
3	Ott-Mar	SEDLD	"7s:6"''	TEMP	75.0	CSTAB	50.0	FLOW	50.0	HABD	50.0"	RIPCN	50.0
,,,,,,,3,4.	Mar-May	RIPCN	75.0	TEMP	75.0	SEDLD	50.6	HABD	50.0	FLOW	42.9	CSTAB	33.8
5	May-Ott	RIPCN	58,2	TEMP	58.2	HABD	38.	PATHO	't 9.4				
6	Oct-Mar	CSTAB	..,.!?,!.	HABD	45.4	RIPCN	45.4	SEDLD	45,4,	PATHO	22.7	TE MP	22.
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Rock Cr - Whiskey Cr (RM 133.8 -136.6 from Snake R)

Restoration benefit category:	A	Chinook usage score:	57.4	Habitat productivity loss score:	-3604.5

Life stage	Months	No. vacant lie history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
	a	112	85	27	0	1.8	-52.4	
		90						
	M							
	M M							
	M							

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	75.0	HABD	62.5						
1,2,3	Aug-Ott	RIPCN	75.0	SEDLD	75,0	TEMP	75,0	HABD	62.5	CSTAB	50.0		
3	Ott-Mar	SEDLD	75.0	TEMP	75.0	CSTAB	50.0	FLOW	25.0	HABD	25.0	RIPCN	'25.0
3,4	Mar-May	RIPCN	38.5	TEMP	38.5	HABD	25.7	CSTAB	25.4	SEDLD	25.4	FLOW	16.9
5	May-Ott	RIPCN	37.9	TEMP	37,9	HABD	"25.3'"	PATHO	12,6	CSTAB	9.0	SEDLD	9.0
6	Ott-Mar	CSTAB	27.9	HABD	27,9	RIPCN	27.9	SEDLD	27.9	PATHO	13.9	TEMP	13.9
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Whiskey Cr - Jordan Cr (RM 136.6 -139.1 from Snake R)

Restoration benefit category:	A	Chinook usage score:	61.7	Habitat productivity loss score:	-3524.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	103	68	35	0	1.9	-59.9	-493.0
1,2,3	Aug-Oct	90	50	40	0	6.2	-46.7	-710.4
3	Oct-Mar	180	100	80	0	8.3	0.0	-1156.0
3,4	Mar-May	57	31	26	0	5.0	-65.0	-414.6
5	May-Oct	119	68	51	0	9.9	-49.3	-682.8
6	Oct-Mar	19	19	0	0	1.4	-93.3	-68.1
7	Mar-Jun	10	10	0	0	30.3	0.0	0.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	75.0	HABD	45.6	RIPCN	45.6	SEDLD	37.5	CSTAB	25.0		
1,2,3	Aug-Ott	HABD	75.0	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0		
3	Ott-Mar	SEDLD	75.0	TEMP	75.0	CSTAB	50.0	FLOW'	50.0	HABD	50,0	RIPCN	50.0
34	Mar-May	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	CSTAB	50.0	HABD	50.0	FLOW	38.4
5	May-Ott	RIPCN	61.6	TEMP	61,6	HABD	41.0	"PATHO	20,5				
6	Ott-Mar	CSTAB	50.0	HABD	50.0	RIPCN	50.0	SEDLD	50,0	PATHO	25.0	TEMP	25.0
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Jordan Cr - Beaver Cr (RM 139.1 -145.8 from Snake R)

Restoration benefit category:	D	Chinook usage score:	32.1	Habitat productivity loss score:	-1605.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantiiy	% change	Habitat productivity loss score
1	Apr-Aug	74	58	16	0	2.0	-49.2	-272.1
123	Aug-Oct	50	40	10	0	6.2	-42.8	-394.7
3	Ott-Mar	100	80	20	0	83	-2.2	-642.2
34	Mar-May	40	21	19	0	4.4	-33.9	-149.5
5	May-Ott	135	67	68	0	10.1	-7.9	-123.0
6	Ott-Mar	55	55	0	0	1.4	-11.6	-24.4
7	Mar-Jun	9	9	0	0	30.3	-2.9	0.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	75.0	HABD	62.5						
1,2,3	Aug-Oct	RIPCN	75.0	SEDLD	75.0	TEMP	75.0	HABD	62.5	CSTAB	50.0		
3	Oct-Mar	SEDLD	75.0	TEMP	750"'	CSTAB	50.0	FLOW ""	25.0	HABD	25.0"	RIPCN	25.0'
3,4	Mar-May	CSTAB	24.4	SEDLD	24.4	TEMP	24.4	FLOW	16.2	HABD	16.2	RIPCN	16.2
5	May-Oct	CSTAB	12.7	HABD	127	RIPCN	""12;7	SEDLD	12.7	TEMP	9.2	PATHO	6.3
6	Oct-Mar	CSTAB	6.2	HABD	6.2	RIPCN	6.2	SEDLD	6.2	PATHO,	?!	TEMP	3
7	Mar-Jun												

Abundance level refera to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Levei 1: Low to average (relative to other reaches) abundance
Levei 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Meadow Cr - Fly Cr (RM 147.0 -151.3 from Snake R)

Restoration benefit category:	B	Chinook usage score:	57.9	Habitat productivity loss score:	-2482.3

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	64	47	17	0	6.5	-38.7	-281.0
1,2,3	Aug-Oct	50	30	20	0	4.9	-60.0	-450.8
3	Oct-Mar	100	60	40	0	6.2	-60.0	-378.8
3,4	Mar-May	60	48	12	0	8.6	-60.0	-369.6
5	May-Oct	238	218	20	0	6.1	-58.1	-915.4
6	Oct-Mar	39	39	0	0	6.2	-59.1	-87.8
7	Mar-Jun	5	5	0	0	28.7	0.0	1.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	48.4	RIPCN	32.3	HABD	19.1						
1,2,3	Aug-Ott	TEMP	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	HABD	37.5		
3	Ott-Mar	CSTAB	50.0	SEDLD	50.0	TEMP	'50;0	RIPCN	25.0	FLOW'	12.5	HABD	12.5
3,4	Mar-May	TEMP.	75.0	RIPCN	50.0	CSTAB	25.0	HABD	25.0	PATHo	25.0	SEDLD	25.0
"'5	May-Ott	TEMP	74,4	RIPCN	49.6	CSTAB	26.2	SEDLD	26.2	HABD	24.8	PATHO	24.8
6	Ott-Mar	CSTAB	49,2	RIPCN	49.2	SEDLD	49.2	PATHO	24.6	TEMP	24.6		
7	Mar-Jun												

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.

Reach: **Fly Cr - head of canyon 1.3** miles downstream of Sheep Cr (RM 151.3 -159.4 from Snake R)

Restoration benefit category:	B	Chinook usage score:	56.2	Habitat productivity loss score:	-1826.5

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	59	39	20	0	8.1	...	-216.0
1,2,3	Aug-Ott	50	20	30	0	4.8		-456.7
3	Ott-Mar	100	40	60	0	5.6	-61.8	-378.8
3,4	Mar-May	55	46	9	0	8.3	-60.0	-346.9
5	May-Ott	140	140	0	0	7.0	-71.1	.385.1
6	Ott-Mar	19	19	0	0	5.7	-61.9	-43.6
7	Mar-Jun	3	3	0	0	27.4	0.0	0.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Atf 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	62.5	RIPCN	32.3	CSTAB	25.0	HABD	25.0	SEDLD	25.0		
1,2,3	Aug-Ott	TEMP	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	HABD	25.0		
3	Oct-Mar	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	TEMP	50.0	FLOW	25.0	HABD	25.0
3,4	Mar-May	TEMP	75.0	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	FLOW	25.0	HABD	250
5	May-Ott	TEMP	73.3	RIPCN	48.8	HABD	24.4	PATHO	24.4				
6	Ott-Mar	CSTAB	50.0	RIPCN	50.0	SEDLD	50.0	PATHO	25.0	TEMP	25.0		
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Head of canyon 1.3 miles downstream of Sheep Cr - LimberJim Cr (RM 159.4 -164.2 from Snake R)

Restoration benefit category:	D	Chinook usage score:	23.4	Habitat productivity ioss score:	-1159.8

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	54	47	7	0	5.1	-38.0	-197.7
1,2 3 '	Aug-Ott	50	40	10	o '	6 . 3 '	-18.0	:459.7'
3	Ott-Mar	100	80	20	0	9.1	-4.5	-358.1
34	Mar-May	26	23	3	0	8.6	-42.6	-139.7
5	May-Ott	6	6	0	0	3.3	-30.5	-4.7
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	2	2	0	0	17.6	0.0	0.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Art 1	% change	Att 2	% change	Art 3	% change	Att 4	% change	Art 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	75.0	HABD	62,5	FLOW	50.0	OXYG		NUTLD	12.3
1,2,3	Aug-Oct	CSTAB	75.0	RIPCN	75.0	TEMP	75.0	HABD	62.5	FLOW		SEDLD	50.0
3'	Ott-Mar	CSTAB	"75;0	SEDLD	50.0	TEMP	50.0	HABD	37.5	FLOW	25.0	RIPCN	25.0
.3,4	Mar-May	CSTAB	37.0	HABD	37.0	FLOW	24.6	RIPCN	24.6	SEDLD	24.6	TEMP	24.6
5	May-Ott	CSTAB	21.0	HABD	21.0	RIPCN	21.0	PATHO	10.5	SEDLD	105	TEMP	10.5
6	Ott-Mar	NA	NA	NA	NA	NA	N	.. ..II..	NA	NA	NA	NA	NA
7	Mar-Jun												

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

- Level 1: Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: **LimberJim Cr - Clear Cr (RM 164.2 -166.9 from Snake R)**

Restoration benefit category:	**F**	**Chinook usage score:**	**21.0**	**Habitat productivity loss score:**	**-214.1**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity
		Total no.	1	2	3	Patient quantity	% change	loss score
1	Apr-Aug	31	25	6	0	1.3	-81.1	-16.1
1,2,3	Aug-Oct	50	40	1 0	0	2.7	-25.0	-32.4
3	Ott-Mar	100	80	20	0	7.4	0.0	-147.3
34	Mar-May	11	9	2	0	12.6	-40.4	-18.3
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	CSTAB	25.0	RIPCN	24.2	HABD	12.5				
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0	HABD	12.5				
3	Oct-Mar	RIPCN	50.0	SEDLD	50.0	CSTAB	25.0	PATHO	25.0				
3,4	Mar-May	RIPCN	50.0	SEDLD	44.7	PATHO	25.0	CSTAB	22.4				
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- **prespawner;** 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling**presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Grande Ronde R.
Reach: Clear Cr - headwaters (RM 166.9 -170.1 from Snake R)

Restoration benefit category:	F	Chinook usage score:	3.8	Habitat productivity loss score:	-41,7

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	4.3	0.0	-3.2
123	Aug-Ott	10	10	0	0	3.0	0.0	-6.5
3	Ott-Mar	20	20	0	0	4.8	0.0	-29.5
34	Mar-May	2	2	0	0	5.2	0.0	-2.5
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	RIPCN	25.0	SEDLD	25.0	CSTAB	12.5						
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0						
3	Oct-Mar	SEDLD	50.0	CSTAB	25.0	RIPCN	25.0	PATHO	12.5				
3,4	Mar-May	RIPCN	25.0	SEDLD	25.0	CSTAB	12.5	PATHO	12.5				
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Hurricane Cr.**
Reach: **Mouth -** Lower Alderslope Ditch (RM 121.9 -124.9 from Snake R)

Restoration benefit category:	**F**	**Chinook usage score:**	**6.7**	**Habitat productivity loss score:**	**-239.5**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	15	9	6	0	0.7	-53.7	
1,2,3	Aug-Oct	10	0	10	0	23	-83.6	
3	Ott-Mar	20	0	20	0	3.2	-80.2	-64.0
34	Mar-May	7	5	2	0	3.6	-815	-615
5	May-Ott	3	3	0	0	3.0	-47.3	-3,3
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	1	1	0	0	13.2	-14.8	0.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	50,0	SEDLD	37.5	FLOW	27.0	HABD	27.0	RIPCN	27.0	CSTAB	125
1,2,3	Aug-Oct	SEDLD	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	TEMP	50.0	CSTAB	25.0
3	Ott-Mar	HABD	75.0	SEDLD	75.0	RIPCN	500	TEMP	" 50.0	CSTAB	25.0	" FLOW	25.0
3,4	Mar-May	HABD	75.0	SEDLD	75.0	RIPCN	50.0	TEMP	50.0	CSTAB	25.0	FLOW	25.0
5	May-Ott	HABD	44.3	FLOW	29.5	RIPCN	29.5	PATHO	14.8	PRED	14.8		
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Hurricane Cr.

Reach: Lower Alderslope Ditch - Upper Alderslope Ditch Diversion (RM 124.9 -128,2 from Snake R)

Restoration benefit category:	A	Chinook usage score:	48,0	Habitat productivity loss score:	-3504.4

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity] loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	54	54	0	0	0,0	-100.0	-515.1
i 2“3”'	Aug-Ott	90	80	0	0	1.1	-64.6	:822,7“'
3	Ott-Mar	180	180	0	0	3.2	-20.7	-1054.4
34	Mar-May	42	42	0	0	1.6	-664	-199,7
5	May-Ott	94	94	0	0	0.0	-100,0	-873.0
6 “	Oct-Mar	19	19	0	0	“ “ “ 0.5	-86,8	-39.9
7	Mar-Jun	1	1	0	0	12,1	-26.7	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	100.0	HABD	50,0								
,1,2,3	Aug-Ott	FLOW	100,0	HABD	50.0	SEDLD	25.0						
3	Ott-Mar	FLOW	75,0	SEDLD	25.0	HABD	12.5	PATHO	‘12.5	WITH	12.5		
3,4	Mar-May	FLOW	50.0	HABD	50.0	CSTAB	25.0	PATHO	12.5	SEDLD	12.5	WITH	12.5
5	May-Oct	SEDLD	75,0’	CSTAB	50.0	FLOW	50.0	HABD	50.0	PATHO	25.0	RIPCN	25.0
6	Oct-Mar	SEDLD	75.0	CSTAB	50.0	FLOW	50.0	PATHO	25.0	RIPCN	25.0		
7	Mar-Jun												

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

“NA” indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Joseph Cr.
Reach: Mouth - Cottonwood Cr (RM 3.7- 8,2 from Snake R)

Restoration benefit category: F	Chinook usage score: 0.0	Habitat productivity loss score: 0.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation: 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP . competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Joseph Cr.
Reach: Cottonwood Cr - Swamp Cr (RM 8.2- 37.7 from Snake R)

Restoration benefit category	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. vacant tife history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
		'A	NA	NA	NA	NA	N	
	M M M M M							

Life stage	Months	Highest productivity impact attributes (?! change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	No		NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	N A		NA
'3	Ott-Mar	NA	N A	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7"	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates thst no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Joseph Cr.
Reach: Swamp Cr - Chesnimnus Cr (RM 37.7 -52,7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. vacant lie history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	N A	NA"	NA	NA	NA	NA	NA"	NA	NA	NA
?!	Mar-May	N	NA	N A	NA	NA	NA	NA	! !	NA	NA	NA	$
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life **stages:** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lookingglass Cr.
Reach: Mouth - Little Lookingglass Cr (RM 83.4 -87.6 from Snake R)

Restoration benefit category:	F	Chinook usage score:	15.2	Habitat productivity loss score:	-207.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	9A	ZA	0	0	A.!	0.0	-43.9
1,2,3	Aug-Oct	40	40	0	0	2.6	-51.0	-152.8
3	Oct-Mar	80	80	0	0	2.7	-60.0	-10.5
3,4	Mar-May	8	8	0	0	4.5	-42.9	-0.1
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	50.0	PATHO	25.0	.4							
1,2,3	Aug-Oct	TEMP	50.0	HABD	25.0	PATHO	25.0						
3	Oct-Mar	FLOW	25.0	PATHO	25.0								
3,4	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Oct	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no lie history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lookingglass Cr.
Reach: Little Lookingglass Cr - headwaters (RM 87.6 -93.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity:
		Total no.	1	2	3	Patient quantity	% change	ioss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	N A	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	N	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	$	NA	NA	NA	{	NA
1,2,3	Aug-Ott	NA	NA	N A	NA	NA	NA		NA	NA	NA		NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
,3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Levei 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-relatedlosses)
RiPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the tempiate.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: **Mouth - Clear'water Ditch** (RM 105.8 -108.3 from Snake R)

Restoration benefit category:	B	**Chinook usage score:**	56.6	**Habitat productivity loss score:**	-2645.8

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	75	55	15	5	6.8	-48.9	-467.5
1,2,3	Aug-Oct	90	70	20	0	13.3	-15.3	-845.6
3	Oct-Mar	180	140	40	0	18.2	1.8	-794,4
3,4	Mar-May	64	44	15	5	18.1	3.8	-211.5
5	May-Oct	215	172	43	0	15.9	0.2	-302.1
6	Oct-Mar	38	38	0	0	12.4	0.8	-26.4
7	Mar-Jun	4	4	0	0	21.5	2.7	17

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Art 1	% change	Att 2	% change	Att 3	% change	Art 4	% change	Att 5	% change	Art 6	% change
1	Apr-Aug	TEMP	62.5	FLOW	55,6	OBST	37.1	HABD	18.5	CSTAB	12.5	WITH	12.5
1,2,3	Aug-Oct	FLOW	75.0	TEMP	75.0	OBST	50.0	CSTAB	25.0	HABD	25.0	WITH	25.0
3	Ott-Mar'	HABD	50,0	TEMP	50.0	CSTAB	25.0	FLOW	25,0	PATHO	250	WITH	25.0
3,4	Mar-May	TEMP	46.6	HABD	44.0	CSTAB	23.3	FLOW	23,3	WITH	23.3	PATHO	22.0
5	May-Ott	TEMP	38.1	FLOW	12.7	HABD	"12.7	PATHO	12.7	WITH	12.7		
6	Ott-Mar	FLOW	28.1	CSTAB	14.0	HABD	14.0	PATHO	14.0	SEDLD	14.0	WITH	14.0
7	Mar-Jun	WITH	8.1										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3. incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearting presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Clearwater Ditch - Cross Country Ditch (RM 108.3 -110.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	7.8	Habitat productivity loss score:	-87.8

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	26	13	8	5	9.1	-29.4	-5.6
1,2,3	Aug-Ott	10	0	1 0	" o"	9 : 5 " "	-48.3	-26.3
3	Ott-Mar	20	0	20	0	13.4	-32.3	-14.8
34	Mar-May	13	4	4	5	12.2	-29.8	-40.3
5	May-Ott	7	7	0	0	4.9	-11.2	-1.1
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	2	2	0	0	23.1	1.7	0.3

Life stage	Months	Highest productivity y impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	An 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	TEMP	25.0	HABD	12.5	WITH	12.5				
1,2,3	Aug-Ott	CSTAB	25.0	FLOW	25.0	SEDLD	25.0	TEMP	25.0	WITH	25.0	HABD	12.5
3	Ott-Mar	CSTAB	25.0	FLOW	25.0	HABD	25.0	SEDLD	25.0	WITH	25.0	PATHO	12.5
34	Mar-May	HABD	19.6	WITH	19.6	CSTAB	9.8	FLOW	9.8	PATHO	9.8	SEDLD	
5	May-Ott	HABD	9.5	CSTAB	4.7	PATHO	4.7	SEDLD	4.7	FLOW	1.2	TEMP	
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA		N	NA	NA
7	Mar-Jun	WITH	2.5										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages.' 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Cross Country Ditch - Sheep Ridge Dam (RM 110.8 -115.0 from Snake R)

Restoration benefit category:	B	Chinook usage score:	56.4	Habitat productivity loss score:	-1617.9

Life stage	Months	No. vacant tife history pathways by abundance level: Total. no	1	2	3	Key habitat change: Patient quantitv	% chanoe	Habitat productivity} lass score
1	Apr-Aug	45	33	7	5	8.0	-168	.1887
1,2,3	Aug-Oct	50	40	10	0	2.0	-66.4	-198.4
3	Oct-Mar	100	80	20	0	0.9	-83.9	-146.4
34	Mar-May	64	56	3	5	1.1	-83.9	-433.8
5	May-Oct	208	208	0	0	7.0	-66.2	-608.9
6	Oct-Mar	38	38	0	0	12.9	-2.5	-44.2
7	Mar-Jun	2	2	0	0	19.8	0.0	2.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	56.5	HABD	37.7	WITH	37.7	CSTAB	25.0	OBST	18.8	RIPCN	18.8
1,2,3	Aug-Oct	FLOW	75.0	CSTAB	50.0	HABD	50.0	WITH	50.0	OBST	25.0	RIPCN	25.0
3	Oct-Mar	CSTAB	50.0	HABD	50.0	FLOW	25.0	PATHO	25.0	WITH	25.0		
3,4	Mar-May	CSTAB	50.0	FLOW	50.0	HABD	50.0	WITH	50.0	PATHO	25.0	RIPCN	25.0
5	May-Oct	FLOW	50.0	WITH	50.0	HABD	25.0	PATHO	25.0	RIPCN	25.0		
6	Oct-Mar	CSTAB	25.0	HABD	25.0	PATHO	25.0	WITH	25.0				
7	Mar-Jun	WITH	25.0										

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages; 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Sheep Ridge Dam - Silver Cr (RM 115,0 -120.0 from Snake R)

Restoration benefit category:	E	Chinook usage score:	44.3	Habitat productivity loss score:	-2.5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	40	9	1	30	8.9	-54.9	4.1
1,2,3	Aug-Ott	50	0	0	" 5 0 "	10.0	-24.1	31.7
3	Ott-Mar	100	0	0	100	13.3	0.0	3.4
34	Mar-May	20	9	1	10	11.2	-31.1	-41.7
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	16,2										
1,2,3	Aug-Ott	CSTAB	25.0	HABD	12.5								
3	Ott-Mar	CSTAB	25.0	HABD	12.5	PATHO	12:5	RIPCN	12.5	'WITH'	12.5		
34	Mar-May	CSTAB	25.0	HABD	12.5	PATHO	12.5	RIPCN	12.5	WITH	12.5		
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

- Level 1: Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PREO - predators (includes fishing-related losses)
- RiPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lostine R.
Reach: Silver Cr - Lake Cr (RM 120.0 -124.6 from Snake R)

Restoration benefit category:	F	Chinook usage score:	21.8	Habitat productivity loss score:	-56.5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	35	29	6	0	7.0	0.0	0.0
1,2,3	Aug-Oct	50		10	o	5.0	0.0	-62.7
3	Ott-Mar	100	80	20	0	48	0.0	0.0
34	Mar-May	15	13	2	0	5.4	00	6.2
5	May-Ott	NA	NA	NA	NA	NA	NA	A
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% than e	Att 3	% tha%e	Att 4		Att 5	% change	Att 6	% than e
1	Apr-Aug	HABD	22.4	OBST	22.4	PRED	12.5						
1,2,,3	Aug-Ott	HABD	25,0	OBST	25.0	PRED	12.5						
3 "	Ott-Mar	PATHO	25.0										
3,4	Mar-May	PATHO	25.0										
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: **Lostine R.**
Reach: **Lake Cr - East Lostine** R (RM 124.6 -131.7 from Snake R)

(Restoration benefit category:	F	Chinook usage score:	23.8	Habitat productivity loss score:	-58.5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	30	30	0	0	4.8	0.0	0.0
1,2,3	Aug-Oct	50	50	0	0	4.0	0.0	-62.7
3	Oct-Mar	100	100	0	0	3.8	0.0	0.0
3,4	Mar-May	10	10	0	0	3.8	0.0	4.2
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	OBST	25.0	PRED	12.5						
1,2,3	Aug-Ott	HABD	25.0	OBST	12.5	PRED	12.5						
"3	Ott-Mar	PATHO	12.5 "										
3,4	Mar-May	PATHO	12.5										
5	May-Oct	N.	NA	NA	NA	'NA"	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA " "	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the **life** history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level **3**: Exceptionally high (relative to other reaches) abundance

Life stages: 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling**presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Mouth - Cougar Cr (RM 89.8 -99.4 from Snake R)

Restoration benefit category:	B	Chinook usage score:	88.3	Habitat productivity loss score:	-747.5

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	69	58	9	2	2.7	-77,2	-239.3
1,2,3	Aug-Ott	90	90	" o "	0 "	" 2.2	-83.3	-229,3
3	Ott-Mar	180	180	0	0	2.4	-83.3	147.8
3,4	Mar-May	72	50	18	4	13.1	-26.0	-140.5
5	May-Ott	213	94	98	21	15.8	0.0	-286.2
6	Ott-Mar	38	19	19	0 "	36.2	0.0	0.0
7	Mar-Jun	3	1	2	0	60.8	0.0	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	43.9	SEDLD	25.0	CSTAB	12.5	TEMP	12.5				
1,2,3	Aug-Oct	HABD	50.0	SEDLD	50.0	CSTAB	25.0	TEMP	25.0				
3 "	Ott-Mar	HABD	50.0	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25.0
3,4	Mar- May	HABD	50.0	SEDLD	50.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0
5	May-Ott	FLOW	24.9	HABD	24.9	PATHO	24.9	RIPCN	24.9	TEMP	24.9		
6	Ott-Mar	FLOW	25.0	PATHO	25.0								
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Cougar Cr - Liie Miriam R (RM 99.4 -108.4 from Snake R)

Restoration benefit category:	D	Chinook usage score:	29.0	Habitat productivity loss score:	-313.2

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	40	24	14	2	2.8	-81.9	-13.0
1,2,3	Aug-Oct	50	40	10	0	9.8	-22.8	-25.4
3	Oct-Mar	100	80	20	0	14.4	6.7	-225.9
3,4	Mar-May	15	8	6	1	17.0	8.1	-48.0
5	May-Oct	4	0	3	1	12.8	0.0	-0.9
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	1	0	1	0	60.8	4.1	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	TEMP	25.0	SEDLD	16.7	CSTAB	8.3				
1,2,3	Aug-Oct	SEDLD	50.0	CSTAB	25.0	TEMP	25.0	HABD	16.7				
3	Oct-Mar	SEDLD	50.0	CSTAB	25.0	HABD	25.0	TEMP	25.0	FLOW	12.5	PATHO	12.5
3,4	Mar-May	HABD	25.0	SEDLD	25.0	CSTAB	12.5	FLOW	12.5	PATHO	12.5	TEMP	12.5
5	May-Oct	FLOW	12.3	HABD	12.3	PATHO	12.3	RIPCN	12.3				
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Miriam R.
Reach: Little Miriam R - splash dam site (1 m above Garwood Cr; RM 108.4 -119.7 from Snake R)

Restoration benefit category:	E	Chinook usage score:	58.7	Habitat productivity loss score:	-9.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	35	0	28	7	13.6	-60.0	-6.5
123	Aug-Ott	50	0	40	" I o	10.7	-60.0	"12.7'
3	Ott-Mar	100	0	80	20	10.7	-60.0	-44.2
34	Mar-May	40	0	32	8	13.4	-60.0	-17.9
5	May-Ott	114	0	94	20	13.0	-60.0	62,2
6	Ott-Mar	19	0	19		26.7	0.0	-15.3
7	Mar-Jun	1	0	1		44.2	0.0	0.0

Life stage	Montha	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	25.0	CSTAB	12.5								
1,2,3	Aug-Ott	CSTAB	25,0	HABD	25.0								
3 "	Ott-Mar	CSTAB	25.0	HABD	25.0	PATHO	25.0						
3,4	Mar-May	CSTAB	25.0	HABD	25.0	PATHO	25.0						
5	May-Ott	CSTAB	25	HABD	25.0	PATHO	25.0						
6	Ott-Mar	CSTAB	25.	HABD	25.0	PATHO	25,0						
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - fiOW
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-reiated losses)
- RIPCN - riparian condition
- SEDLD - sediment ioad
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Minam R.
Reach: Splash dam site - falls (RM 119.7 -138,0 from Snake R)

Restoration benefit category:	F	Chinook usage score:	32.2	Habitat productivity loss score:	45.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	30	0	24	6	10.0	0.0	5.9
1,2,3	Aug-Oct	50	0	40	10	8.4	0.0	32.8
3	Oct-Mar	100	0	80	20	8.6	0.0	0.0
3,4	Mar-May	15	0	12	3	9.8	0.0	6.3
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Ott												
3	Ott-tiar	PATHO	12.5										
34	Mar-May	PATHO	12.5										
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank ceils under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Prairie Cr.
Reach: Mouth - OK Gulch confluence (RM 126.8 -131.8 from Snake R)

[Restoration benefit category:	F	Chinook usage score:	5.8	Habitat productivity loss score:	-107.4

Life stage	Months	No. vacant lie history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	7	1	6	0	3,3	9.0	3.3
1,2,3	Aug-Ott	10	0	10	0	2.3	" 78.6	- 7 . 4
3	Ott-Mar	20	0	20	0	2.3	50.0	-85.8
34	Mar-May	3	1	2	0	2.5	50.0	-17.5
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	SEDLD	37.5	CHEM	25.0	RIPCN	25.	NUTLD	20	CSTAB	12.		
.1,2,3	Aug-Ott	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	RIPCN	25	NUTLD	12.		
3	Ott-Mar	HABD	" '50:0"	SEDLD	50.0	CHEM	25.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0
34	Mar-May	HABD	50.0	SEDLD	50.0	cHEM,.,	25.0	CSTAB	25.0	FLOW	250	PATHO	25.0
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in detining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Prairie Cr.
Reach: OK Gulch fork (RM 131.8 -133.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	3.8	Habitat productivity loss score:	285.4

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	6	6	0	0	0.3	0.0	65,0
123	Aug-Ott	10	10	0	0	1.1	0.0	867
3	Ott-Mar	20	20	0	0	1.6	0.0	125.3
34	Mar-May	2	2	0	0	17	0.0	83
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		At! 1	% change	At! 2	% change	At! 3	% change	At! 4	% change	At! 5	% change	At! 6	% change
1	Apr-Aug	HABD	25.0	NUTLD	250	PRED	25.0	RIPCN	25.0	SEDLD	25.0		
,1,2,3	Aug-Ott	SEDLD	75.0	NUTLD	50.0	CSTAB	25.0	RIPCN	25.0	HABD	16.7	PRED	16.7
3	'Ott-Mar	SEDLD	75.0 "'	NUTLD	50.0	CSTAB	25.0	RIPCN	25.0	HABD	125	PATHO	12.5
34	Mar-May	SEDLD	37.5	CSTAB	25.0	NUTLD	25.0	HABD	12.5	PATHO	12.5	RIPCN	12.5
5	May-Ott"	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Sheep Cr.
Reach: Mouth - Chicken Cr (RM 164.2 -165.7 from Snake R)

Restoration benefit category:	**B**	**Chinook usage score:**	**49.0**	**Habitat productivity loss score:**	**-2909.9**

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	63	63	0	0	1.9	-53.4	-481.2
1,2,3	Aug-Oct	2	90			1.1	-60.0	-834.
3	Ott-Mar	180	180			1.9	-60.0	-942.
3,4	Mar-May	47	4 7	0	0	3.0	-68.9	-294.0
5	May-Ott	97	97	0	0	4.5	-31.0	-322.7
6	Ott-Mar	19	19	0	0	2.0	-60.0	-35.1
7	Mar-Jun	2	2	0	0	10,0	0.0	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	75.0	TEMP	65.4	FL	43.	HA BD	43.6	CSTA	37.5	NUTLD	
1,2,3	Aug-Ott	CSTAB	75.0	RIPCN	75.0	TE	75.	FLOW	50.0	HABI	50.0	SEDLD	
3	Ott-Mar	CSTAB	'75,0	HABD	75.0	RIPCN	75.0	FLOW	50.0	SEDLD	50.0	TEMP	50.0
3,4	Mar-May	CSTAB	75.0	HABD	75.0	RIPCN	75.0	TEMP	75.0	FLOW	50.0	SEDLD	50.0
5	May-Oct	HABD	73,2	RIPCN	73.2	TEMP	73,2	NUTLD	24.4	PATHO	24.4		
6	Ott-Mar	HABD	50.0	RIPCN	50.0	PATHO	25.0	SEDLD	25.0				
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawnera that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: **Low to** sverage (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Sheep Cr.
Reach: **Chicken Cr - headwaters (RM 165.7 -173.7 from Snake R)**

Restoration benefit category:	**B**	**Chinook usage score:**	**60.0**	**Habitat productivity loss score:**	**-2050.3**

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity y loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	54	54	0	0	1.6	-60,0	-3648
1,2,3	Aug-Ott	90	90	0	0	0.8	-60.0	-8354
3	Ott-Mar	180	180	0	0	1.5	-60.0	-390.5
3,4	Mar-May	42	42	0	0	33	-600	-145.8
5	May-Ott	94	94	0	0	4.6	-31.8	-239.8
6	Ott-Mar	19	19	0	0	15	-60.0	-74.5
7	Mar-Jun	1	1	0	0	11.0	0.0	0,5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	TEMP	75.0	RIPCN	43.8	FLOW	25.0	HABD	25.0				
1,2,3	Aug-Oct	TEMP	75.0	FLOW	50.0	RIPCN	50.0	HABD	25.0	SEDLD	25.0		
3	Oct-Mar	FLOW	50.0	RIPCN	50.0	SEDLD	25.0	TEMP	25.0	HABD	12.5	PATHO	12.5
3,4	Mar-May	TEMP	75.0	FLOW	50.0	RIPCN	50.0	HABD	25.0	PATHO	25.0	SEDLD	12.5
5	May-Oct	TEMP	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	PATHO	25.0	SEDLD	25.0
6	Oct-Mar	FLOW	50.0	HABD	50.0	RIPCN	50.0	PATHO	25.0	SEDLD	25.0	TEMP	25.0
7	Mar-Jun												

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the lie history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: **1- prespawner;** 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmoit/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no **life** history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Mouth - Minam R (RM 80.0 -89.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	134.7	Habitat productivity loss score	-775.6

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	204	137	51	16	21.7	0.0	-141.0
1,2,3	Aug-Oct	90	90	0	0	31.7	0.0	-104.3
3	Oct-Mar	180	180	0	0	41.6	0.0	-181.4
3,4	Mar-May	147	110	37	0	28.7	0.0	-211.2
5	May-Oct	629	385	232	12	18.5	-36.6	-98.8
6	Oct-Mar	246	151	95	0	41.9	0.0	-39.5
7	Mar-Jun	40	23	13	4	71.5	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Art 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	15.8	CSTAB	12,5	SEDLD	12.5	TEMP	12				
1,2,3	Aug-Ott	PATHO	25.0	CSTAB	14,6	SEDLD	14.6	TEMP	14.6				
"3"	Oct-Mar	CSTAB	25.0	HABD	250	PATHO	25.0	SEDLD	25.0	TEMP	25.0		
3,4	Mar-May	HABD	19.1	PATHO	19.1	COMP	15.9	CSTAB	9.8	SEDLD	9.8	TEMP	98
5	May-Oct	COMP	15.2	HABD	15.2	PATHO	15.2						
6	Ott-Mar	FLOW	13.5	PATHO	13.5								
7"	Mar-Jun												

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Miriam R - Deer **Cr (RM 89.8 -90,8 from Snake R)**

Restoration benefit category	B	Chinook usage score:	80.7	Habitat productivity loss score:	-589.8

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	171	115	42	14	8.7	-10.3	-101.2
1,2,3	Aug-Oct	90	90	0	0	15.9	0.0	-105.2
3	Oct-Mar	180	180	0	0	20.6	-1.5	-77.5
3,4	Mar-May	82	53	29	0	7.8	-49.8	-191.8
5	May-Oct	272	125	137	10	8.2	-52.1	-56.6
6	Oct-Mar	62	25	19	18	8.3	-42.9	-57.8
7	Mar-Jun	24	14	6	4	30.3	-3.4	0.2

Life stage	Months	Highest productivity im ct attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	25.0	RIPCN	25.0	PATHO	12.5						
1,2,3	Aug-Ott	SEDLD	75.0	HABD	25.0	RIPCN	25.0	PATHO	12.5				
3	Oct-Mar	SEDLD	75.0	HABD	12.5	PATHO	12;5	RIPCN	"12.5"'	"			
				SEDLD	34,2	COMP	25.0	PATHO	25.0	RIPCN	25.0		
				COMP	23.4	PATHO	23.4	RIPCN	23.4				
				PATHO	17.7,	RIPCN	17.7						

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearlingpresmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Deer Cr - Dry Cr (RM 90.8 -98.3 from Snake R)

Restoration benefit category:	B	Chinook usage score:	81.3	Habitat productivity loss score:	-756.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	16?	101	47	1A	9.8	-6.8	21.7
		90						
	M	80						
	M M							
	M	58						
	M							

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Atf 5	% change	Atf 6	% change
1	Apr-Aug	SEDLD	37.5	HABD	15.1	PATHO	15.1	RIPCN	151				
1,2,3	Aug-Oct	SEDLD	75.0	HABD	25.0	PATHO	25.0	RIPCN	25.0				
3	Oct-Mar	SEDLD	75.0	HABD	25.0	PATHO	25.0'	RIPCN	25.0				
3,4	Mar-May	HABD	19.1	PATHO	16.4	RIPCN	16.4	COMP	95	SEDLD	46		
5	May-Oct	HABD	18.0	COMP	9.0	PATHO	9.0	RIPCN	90				
6	Oct-Mar	HABD	10.7	PATHO	10.7	PRED	10.7	RIPCN	10.7				
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Dry Cr - Bear Cr (RM 98.3 -101.8 from Snake R)

/Restoration benefit category:	B	Chinook usage score:	83.9	Habitat productivity loss score:	-1498.9

Life stage	Months	No. vacant tife history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	153	63	76	14	9.4	-31.8	-23.4
1,2,3	Aug-Oct	90	20	70	0	7.7	-70.6	-170.4
3	Oct-Mar	180	40	140	0	8.0	-75.0	-693.5
3,4	Mar-May	89	20	54	15	8.8	-57.8	-560.9
5	May-Oct	277	47	109	121	8.5	-31.3	-22.5
6	Oct-Mar	57	19	19	19	8.1	-31.2	-29.3
7	Mar-Jun	18	11	4	3	30.3	-3.4	1.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		An 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	RIPCN	50.0	HABD	37.5	PATHO	12.5						
1,2,3	Aug-Oct	SEDLD	75.0	NUTLD	50.0	RIPCN	50.0	HABD	37.5	OXYG	25.0	PATHO	12.5
3	Oct-Mar	SEDLD	75.0	NUTLD	50.0	HABD	37,5	OXYG	25.0	RIPCN	25.0	FLOW	125
3,4	Mar-May	HABD	75.0	SEDLD	75.0	NUTLD	50,0	RIPCN	50.0	FLOW	250	OXYG	250
5	May-Ott	HABD	27.2	SEDLD	14.3	COMP	13.6	PATHO	13.6	RIPCN	136		
6	Ott-Mar	HABD	20.8	SEDLD	20.8	PATHO	10.4	RIPCN	104				
7	Mar-Jun	COMP	5.6	PATHO	5.6	WITH	5.6						

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Bear Cr - Whiskey Cr (RM 101.8 -103.9 from Snake R)

Restoration benefit category:	B	Chinook usage score:	81.2	Habitat productivity loss score:	-1495.6

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	133	40	79	14	9.3	-31.4	-58.3
1,2,3	Aug-Oct	90	0	90	0	7.7	-70.6	-228.3
3	Oct-Mar	180	0	180	0	8.3	-72.2	-789.5
3,4	Mar-May	79	6	53	20	9.1	-48.6	-372.3
5	May-Oct	247	24	106	117	8.5	-28.5	-18.3
6	Oct-Mar	58	20	19	19	8.3	-29.6	-29.5
7	Mar-Jun	14	9	3	2	33.0	0.0	0.7

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	NUTLD	25.0	TEMP	25.0	HABD	23.0	RIPCN	23.0	OXYG	12.5
1,2,3	Aug-Ott	SEDLD	75.0	HABD	50.0	NUTLD	50,0	RIPCN	50.0	OXYG	25.0	PATHO	25.0
3	Oct-Mar	HABD	75.0	SEDLD	750	NUTLD	50.0	RIPCN	50.0"	FLOW"	25.0	OXYG	25.0""
3,4	Mar-May	HABD	71.6	SEDLD	55.0	RIPCN	47.8	NUTLD	36.6	FLOW	23.9	PATHO	23.9
5	May-Ott	HABD	22.9	PATHO	11.5	RIPCN	11.5						
6	Ott-Mar	HABD	20.5	SEDLD	205	COMP	10.4	PATHO	10.4	WITH	10.4	RIPCN	10.3
7	Mar-Jun	COMP	4.5	PATHO	4.5	WITH	4.5						

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Whiskey Cr - Lostine R (RM 103.9 -105,8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	76.6	Habitat productivity loss score:	-1405.9

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	124	40	70	14	8.7	-33.3	-17.6
123	Aug-Ott	90	0	90	0	7.7	-69.8	-2084
3	Ott-Mar	180	0	180	0	7.6	-72.7	-789.5
34	Mar-May	64	6	48	10	8.3	-571	-3513
5	May-Ott	130	24	103	3	8.1	-465	-15.9
6	Ott-Mar	21	2	19	0	7.6	-66.7	-23.8
7	Mar-Jun	11	8	2	1	30,3	0.0	0.5

	M M											W W	

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearlingpresmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Lostine R - Parsnip Cr (RM 105.8 -109.0 from Snake R)

Restoration benefit category:	B	Chinook usage score:	75.6	Habitat productivity loss score:	-1327.3

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	85	30	46	9	9.2	-44.7	-18.7
1,2,3	Aug-Oct	90	20	70	0	7.7	-61.2	-156.0
3	Oct-Mar	180	40	140	0	8.3	-64.9	-789.5
3,4	Mar-May	51	4	42	5	9.1	-55.9	-320.8
5	May-Oct	132	12	117	3	8.7	-46.0	-188.9
6	Oct-Mar	21	2	19	0	8.3	-59.6	-23.8
7	Mar-Jun	6	4	1	1	33.0	6.7	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Aft 2	% change	Aft 3	% change	Art 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	408	RIPCN	40.8	SEDLD	37.5	NUTLD	25.0	PATHO	204	OXYG	12.5
1,2,3	Aug-Oct	SEDLD	75,0	HABD	50.0	NUTLD	50.0	RIPCN	50.0	OXYG	25.0	PATHO	25.0
3	"Ott-Mar	HABD	75.0	SEDLD	75.0	NUTLD	50.0	RIPCN	50.0"	FLOW	25.0	OXYG	25.0
34	Mar-May	SEDLD	75.0	HABD	67.8	NUTLD	50.0	RIPCN	45.2	OXYG	25.0	PATHO	25.0
5	May-Ott	HABD	44.4	PATHO	22.2	RIPCN	22.2						
6	Ott-Mar	HABD	45.4	SEDLD	45.4	COMP	25.0	PATHO	25.0	WITH	25.0	RIPCN	,22.7
7	Mar-Jun	COMP	6.7	PATHO	6.7	WITH	6.7						

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Parsnip Cr - Hurricane Cr (RM 109.0 -121.9 from Snake R)

Restoration benefit category:	B	Chinook usage score:	140.6	Habitat productivity loss score:	-1686.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	76	18	4	54	9.7	-58.7	-18.4
123	Aug-Ott	90	0	0	'90''	7.5	-74.8	-1560
3	Ott-Mar	180	0	0	180	8.1	-76.2	-789.5
34	Mar-May	114	49'	1 8	47	9 7	-53.2	-616.4
5	May-Ott	388	234	60	94	9.1	-47.0	-45.9
6	Ott-Mar	57	3 8	o	19	8.1	-53.9	-60.6
7	Mar-Jun	5	4	0	1	33.0	-5.0	0.8

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Art 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	41.3	RIPCN	41.3	PATHO	18.5						
1,2,3	Aug-Ott	SEDLD	75.0	NUTLD	50.0	HABD	37.5	RIPCN	37.5	OXYG	25.0	PATHO	12.5
3	Ott-Mar	SEDLD	75.0	NUTLD	5 0 , 0	HABD	37.5	OXYG	2 5 . 0	RIPCN	25.0	FLOW	12.5
3,4	Mar-May	HABD	75.0	RIPCN	50.0	SEDLD	32.0	FLOW	25.0	PATHO	25.0	WITH	25.0
5	May-Ott	HABD	36,9	SEDLD	25.3	PATHO	18.5	RIPCN	18.5				
6	Ott-Mar	HABD	35.4	SEDLD	35.4	PATHO	17.7	RIPCN	17.7				
7	Mar-Jun	COMP	13.7	PATHO	13.7	WITH	13.7						

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the lie history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearlingpresmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Hurricane Cr - Lower Alderslope Ditch (RM 121.9 -126.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	7.1	/Habitat productivity loss score:	-161.3

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	17	9	8	0	28.7	-7.1	-13.3
1,2,3	Aug-Oct	10	0	10	0	19.9	-24.5	-23.8
3	Oct-Mar	20	0	20	0	20.6	-29.1	-87.7
3,4	Mar-May	9	5	4	0	22.7	-18.9	-36.2
5	May-Oct	3	3	0	0	18.8	0.0	0.2
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	1	1	0	0	33.0	0.0	-0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	An 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	SEDLD	37.5	FLOW	27.0	NUTLD	25.0	CHEM	13.5	HABD	13.5	OBST	13.5
1,2,3	Aug-Ott	SEDLD	75.0	FLOW	50,0	NUTLD	50.0	CHEM	25.0	HABD	25.0	OBST	25.0
3	Ott-Mar	SEDLD	75.0	NUTLD	50.0	FLOW	25.0	HABD	25.0	OXYG	25.0	PATHO	25.0
34	Mar-May	SEDLD	75.0	NUTLD	50.0	FLOW	25,0	HABD	,25,0	OXYG	25.0	PATHO	25.0
5	May-Ott	CHEM	15.8	PATHO	15.8	WITH	15.8						
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	FLOW	9.2	WITH	9 . 2								

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the tife history pathways using the reach in this table.
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wallowa R.
Reach: Lower Alderslope Ditch -Wallowa Lake (RM 126.8 -130.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	49.9	Habitat productivity loss score:	-2251.5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	54	48	6	0	1.2	-86.9	-202.3
1,2,3	Aug-Oct	90	80	10	0	0.1	-96.9	-555.0
3	Oct-Mar	180	160	20	0	1.2	-61.3	-1107.4
3,4	Mar-May	42	40	2	0	1.6	-82.3	-353.3
5	May-Oct	94	94	0	0	6.1	-74.1	-15.2
6	Oct-Mar	19	19	0	0	7.8	-3.1	-17.1
7	Mar-Jun	1	1	0	0	33.0	0.0	-1.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	75.0	HABD	50.0	OBST	50.0	RIPCN	50.0	WITH	50.0	CHEM	25.0
1,2,3	Aug-Oct	FLOW	75.0	SEDLD	75.0	HABD	50.0	OBST	50.0	RIPCN	50.0	CHEM	25.0
3	Oct-Mar	FLOW	75.0	SEDLD	75.0	HABD	37.5	CHEM	25.0	RIPCN	25.0	PATHO	12.5
3,4	Mar-May	HABD	50.0	FLOW	37.5	SEDLD	37.5	CHEM	25.0	PATHO	25.0	RIPCN	25.0
5	May-Oct	HABD	50.0	CHEM	25.0	FLOW	25.0	OBST	25.0	PATHO	25.0	RIPCN	25.0
6	Oct-Mar	HABD	50.0	OBST	25.0	PATHO	25.0	SEDLD	25.0				
7	Mar-Jun	PRED	25.0										

Abundance level refers to estimated relative abundance of spawners that spawn in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1. prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: Mouth - Crooked Cr (RM 45.1 -51.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	3.8	Habitat productivity loss score:	32.0

Life atage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	8	4	4	0	12.0	00	320
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	20	4	16	0	8,2	0.0	0.0
5	May-Oct	91	0	91	0	9,4	0.0	0.0
6	Ott-Mar	19	0	19	0	6 . 8	0.0	00
7	Mar-Jun	1	0	1	0	30.8	0.0	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	N A	NA	NA	"NA	NA	NA	NA	NA
3,4	Mar-May	PATHO	3.1										
5	May-Ott	PATHO	3.1										
6	Oct-Mar	PATHO	3.1										
7	Mar-Jun												

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - now
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wenaha **R.**
Reach: Crooked **Cr** - Fairview **Cr** (RM 51.8 -55,3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	16.4	Habitat productivity loss score:	-37.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	28	24	4	0	9.4	0.0	-39.1
123	Aug-Ott	40	40	0	0	69	00	-5.2
3	Ott-Mar	80	80	0	0	6.7	0.0	0
34	Mar-May	12	8	4	2	8.8	0.0	7.3
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PRED											
123	Aug-Oct	PRED											
3	Ott-Mar	PATHO	12.5										
34	Mar-May	PATHO	12.5										
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

- **Level** 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level **3**: Exceptionally high (relative to other reaches) abundance

Life *stages:* 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- **overwintering;** 7- yearling **presmolt/smolt**

Attributes: CHEM - chemicals
CSTAB - channel **stability**
COMP - competition (with other species)
FLOW - ftOW
HABD - **habitat** diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - **riparian** condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no lie history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: Fairview Cr - forks (RM 55.3 -65,9 from Snake R)

Restoration benefit category:	F	Chinook usage score:	23.4	Habitat productivity loss score:	-2.7

Liie stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity 10ss score
1	Apr-Aug	24	0	24	0	16.0	0.0	-5,1
1,2,3	Aug-Oct	42				8.7	0.0	
3	Oct-Mar	80				63	0.0	
34	Mar-May	12	0	12	0	6.6	0.0	5.1
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from templat): At! 1	% change	At! 2	% change	At! 3	% change	At! 4	% change	At! 5	% change	Att 6	% change
1	Apr-Aug	PRED	18.8										
1,2,3	Aug-Oct	PRED	18.1										
3	Oct-Mar	PATHO	25.0										
3,4	Mar-May	PATHO	25.0										
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7-yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Wenaha R.
Reach: South Fork Wenaha R (RM 65.9 -72.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

Life stsge	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient uantit	% than e	
1	Apr-Aug	NA	NA	NA	NA	N A	NA	NA
1,	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells undar attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

APPENDIX F

Imnaha Stream **Reach** Summaries
for **Primary and Secondary** Life History Pathways

Reaches analyzed in the Imnaha, listed in the order they appear in Appendix F.

stream	Reach	Benefit Category for Primary & Secondary Life Histories
Big Sheep Cr.	Mouth - Camp Cr (RM 22.3 -23.4 from Snake R)	F
Big Sheep Cr.	Camp Cr - Little Sheep Cr (RM 23.4 -25.4 from Snake R)	F
Big Sheep Cr.	Little Sheep Cr - Squaw Cr (RM 25.4 -37.7 from Snake R)	D
Big Sheep Cr.	Squaw Cr - Marr Cr (RM 37.7 -39.3 from Snake R)	F
Big Sheep Cr.	Marr Cr - Griffith Cr (RM 39.3 -45.3 from Snake R)	D
Big Sheep Cr.	Griffith Cr - Carrel Cr(RN445.3 -47.0 from Snake R)	D
Big Sheep Cr.	Carrel Cr - Owl Cr (RM 47.0 -53.5 from Snake R)	D
Big Sheep Cr.	Owl Cr - Lick Cr (RM 53.5 -57.4 from Snake R)	B
Big Sheep Cr.	Lick Cr - South Fork (RM 57.4 -58.9 from Snake R)	B
Imnaha R.	Mouth - Cow Cr (RM 0.0- 4.3 from Snake R)	F
Imnaha R	Cow Cr - Lightning Cr (RM 4.3 -5.4 from Snake R)	F
Imnaha R.	Lightning Cr - Horse Cr (RM 5.4- 10.8 from Snake R)	F
Imnaha R	Fence Cr - Big Sheep Cr (RM 16.3 -22.3 from Snake R)	F
Imnaha R.	Horse Cr - Fence Cr (RM 10.8 -16.3 from Snake R)	F
Imnaha R.	Big Sheep Cr - Freezeout Cr (RM 22.3 -35.2 from Snake R)	F
Imnaha R.	Freezeout Cr - Grouse Cr (RM 35.2 -40.6 from Snake R)	F
Imnaha R	Grouse Cr - Summit Cr (RM 40.6 -43.6 from Snake R)	D
Imnaha R	Summit Cr - Crazyman Cr (RM 43.6 -49.4 from Snake R)	F
Imnaha R.	Crazyman Cr - GumbootCr(RA449.4 -52.7 from Snake R)	D
Imnaha R	Gumboot Cr - Dry Cr (RM 52.7 -55.4 from Snake R)	E
Imnaha R.	Dry Cr - Skookum Cr (RM 55.4 -61.9 from Snake R)	B
Imnaha R.	Blue Hole - forks (RM 66.4 -71.4 from Snake R)	E
Imnaha R.	Skookum Cr - Blue Hole (RM 61.9 -66.4 from Snake R)	E
Imnaha R.	South Fork Imnaha R (RM 71.4 -76.1 from Snake R)	E
Lightning Cr.	Mouth - forks (RM 5.4- 13.9 from Snake R)	F
Little Sheep Cr.	Mouth - Bear Gulch (RM 25.4 -28.5 from Snake R)	F
Little Sheep Cr.	Bear Gulch - Devil's Gulch (RM 28.5 -30.9 from Snake R)	F
Little Sheep Cr.	Devil's Gulch - Lightning Cr (R.M 30.9 -33.1 from Snake R)	F
Little Sheep Cr.	Lightning Cr - Hayden Cr (RM 33.1 -38.8 from Snake R)	F
Little Sheep Cr.	Hayden Cr - McCully Cr (RM 38.8 -48.8 from Snake R)	F

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Mouth - Camp Cr (RM 22.3 -23.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	13.1	Habitat productivity loss score:	-5.0

Life stage	Months	No. tife history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	5	5	0	0	0	12	12	0	0	0	6.0	0.0	-3.9
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	N	NA		Y?	2	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA		NA		NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N	NA
5	May-Ott	o	0	0	0	0	4	4	0	0	0	2.9	0.0	-24
6	Ott-Mar	o	0	0	0	0	4	4	0	0	0	71	0.0	-3.0
7	Mar-Jun	5	5	0	0	0	A	A	o	0	0	15.3	0.0	4 . 2

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	4.7	RIPCN	4.7	SEDLD	4.7	TEMP	4.7				
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	N	N	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	N	N	NA	NA	
5	May-Ott	CSTAB	7.0	FLOW	7.0	PATHO	7.0	TEMP	7.0	WITH	7.0		
6	Ott-Mar	CSTAB	9.9	FLOW	9.9	PATHO	9.9	TEMP	9.9	WITH	9.9		
7	Mar-Jun	WITH	9.2										

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the tife history pathways using the reach In this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawala

"NA" indicates that no tife history pathway meeting the criteria usedn defining these pathwaya was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Camp Cr - Little Sheep Cr (RM 23.4 -25.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	47.3	[Habitat productivity ioss score:	-67.3

		No. iife history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	ioss score
1	Apr-Aug	5	5	0	0	0	12	12	0	0	0	6.6	-53	-155
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	o	0	0	0	6	6	o	0	0	5.1	0.0	37
6	Ott-Mar	o	0	0	0	0	21	21	0	0	0	13.1	0.0	-53.9
7	Mar-Jun	5	5	0	0	0	4	4	0	0	0	21.6	0.0	5.8

		Highest productivity impact attributea (% change in impact from template)											
Life atage	Months	Atf 1	% change	Aft 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	18.7	RIPCN	18.7	SEDLD	18.7	TEMP	16.7				
1,23	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	TEMP	14.5	COMP	7.2	HABD	7.2	PATHO	7.2	SEDLD	7.2		
6	Ott-Mar	WITH	25.0	CSTAB	23.1	FLOW	23.1	PATHO	23.1	TEMP	23.1		
7	Mar-Jun	WITH	12.7										

Abundance level refers to the average abundance of apawners that spawn in the natal stream reaches that populate the life history pathways using tha reach in this table:

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Level 3: 30-60 spawners
- Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Little Sheep Cr - Squaw Cr (RM 25.4 -37.7 from Snake R)

Restoration benefit **category:** D	**Chinook** usage score: 86.1	**Habitat** productivity loss score: -114.3

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	11	11	0	0	0	26	26	0	0	0	11.8	-13.7	-41.7
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA		NA	N	A	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	o	0	0	0	0	10	10	0	0	0	57	0.0	-119
6	Ott-Mar	o	0	0	0	0	37	37	0	0	0	15.6	0.0	-663
7	Mar-Jun	6	6	0	0	0	4	4	0	0	0	27.2	0.0	5.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Atf 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	23.1	RIPCN	23.1	SEDLD	23.1	TEMP	23.1				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	CSTAB	11.0	FLOW	11.0	PATHO	11.0	TEMP	11.0	WITH	11.0		
6	Ott-Mar	CSTAB	16.1	FLOW	16.1	PATHO	16.1	TEMP	161	WITH	161		
7	Mar-Jun	WITH	11.1										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Level 3: 30-60 spawners
- Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.'
- CHEM - chemicals
- CSTAB - channel stability
- cOMP - competition (with other species)
- FLOW - ftOW
- HABD - habitat diversity
- NUTLD - nutrient ioad
- OBST - obstructions
- O)(YG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attribute indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Squaw Cr - Marr Cr (RM 37.7 -39.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	27.7	Habitat productivity loss score:	-24.4

Life stage	Months	No. life history pathways by current usage abundance level: Primary Total no.	Primary 1	Primary 2	Primary 3	Primary 4	Secondary Total no.	Secondary 1	Secondary 2	Secondary 3	Secondary 4	Key habitat change: Patient quantity	% change	Habitat productivity 10ss score
1	Apr-Aug	5	5	0	0	0	12	12	0	0	0	6.3	-8.7	-14.4
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	10	10	0	0	0	3.0	0.0	-8.9
6	Oct-Mar	0	0	0	0	0	1	1	0	0	0	7.5	00	-19
7	Mar-Jun	5	5	0	0	0	1	1	0	0	0	13.2	0.0	0.8

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Atf 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	17.4	RIPCN	174	SEDLD	17.4	TEMP	17.4				
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5""	May-Oct	" TEMP	20.8	COMP	10.4	HABD	10.4	PATHO	10.4	SEDLD	10.4		
6	Ott-Mar	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25.0	WITH	25.0		
7	Mar-Jun	WITH	11.6										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

fife *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversify
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Marr Cr - Griffith Cr (RM 39.3 -45.3 from Snake R)

Restoration benefit category:	D	**Chinook** usage score:	145.9	**Habitat** productivity loss score:	-343.7

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	toss score
1	Apr-Aug	5	5	0	0	0	12	12	0	0	0	7.2	-7.2	-119
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	4	4	0	“ ‘o “	0	16	16 “	0	0	0	1.4	-418	-680
5	May-Ott,	25	25	o	0	0	102	102	0	0	0	4.7	-5.7	-177.6
6	Ott-Mar	19	19	0	0	0	19	19	0	0	0	9.2	-16	-66.8
7	Mar-Jun	5	5	0	0	0	1	1	0	0	0	15'2	-3.4	0 8

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	At! 3	% change	Aft 4	% change	An 5	% change	Att 6	% change
1	Apr-Aug	FLOW	14.4	RIPCN	14.4	SEDLD	14.4	TEMP	14.4				
123	Aug-Oct	NA	NA	NA	NA		NA	NA	NA	NA	NA	No	NA
3	Ott-Mar	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	TEMP	28.0	CSTAB	14.0	HABD	14.0.	PATHO	14.0	SEDLD	14.0	FLOW	7.0
5	May-Ott	TEMP	28.0	HABD	14.0	PATHO	14.0	SEDLD	14.0	CSTAB	103	FLOW	103
6	Ott-Mar	CSTAB	15.8	FLOW	15.8	?ATH.Q.	15.8	TEMP	15.	WITH	15.8		
7	Mar-Jun	WITH	11.0										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Griffith Cr - Carrot Cr (RM 45.3 -47,0 from Snake R)

Restoration benefit category:	D	Chinook usage score:	352.1	Habitat productivity loss score:	-109.7

		No life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	10	10	0	0	0	22	22	0	0	0	4.6	-5.4	0.0
1,2,3	Aug-Ott	10	10	0	n	n	20	20	o	0	0	2.7	-51.0	-18.8
3	Oct-Mar	20	20	0	0	0	40	40	0	0	0	2.8	-60.0	-106.9
3,4	Mar-May	9	9	0	0	0	20	20	0	0	0	7.3	-19.0	-5.2
5	May-Oct	25	25	0	0	0	52	52	o	0	0	3.7	-58.1	19.6
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	7.0	0.0	1.0
7	Mar-Jun	4	4	o	0	0	0	0	0	0	0	10.9	0.0	0.6

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Atf 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	FLOW	19.2								
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0								
3	Ott-Mar	SEDLD	50.0	PATHO	25								
34	Mar-May	SEDLD	50,0	FLOW	25	PATHO	25.0						
5	May-Ott	FLOW	23.7	PATHO	23.7	SEDLD	23.7						
6	Oct-Mar	COMP	25.0	PATHO	25.0	SEDLD	25.0						
7	Mar-Jun												

Abundance level refers to the average abundance of apawners that spawn in the natal stream reaches that populate the life history pathways using the reach In this table:

Level 1: 0-10 spawners
Level 2: 10-30 apawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overvvintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Carrot Cr - Owt Cr (RM 47.0 -53.5 from Snake R)

Restoration benefit category:	D	Chinook usage score:	353.3	/Habitat productivity loss score:	-109.8

Life stage	Months	NO. life history pamways by current usage abundance level: Primary Total no.	Primary 1	Primary 2	Primary 3	Primary 4	Secondary Total no.	Secondary 1	Secondary 2	Secondary 3	Secondary 4	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	9	9	0	0	0	20	20	0	0	0	4.4	-13.4	0.0
1,2,3	Aug-Ott	10	10	0	0	0	20	20	0	0	0	3.2	-51.0	-18.8
3	Ott-Mar	20	20	0	0	0	40	40	0	0	0	3.3	-60.0	-106.9
34	Mar-May	9	9	0	0	0	20	20	0	0	0	7.5	-19.11	-5.2
5	May-Oct	25	25	0	0	0	50	50	0	0	0	3.9	-61.0	19.6
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	8.3	0.0	1.0
7	Mar-Jun	3	3	0	0	0	0	0	0	0	0	12.7	0.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	23.2	SEDLD	23.2								
123	Aug-Ott	SEDLD	50.0	FLOW	25.0								
3	Ott-Mar	SEDLD	50.0	PATHO	125								
3,4	Mar-May	FLOW	250	PATHO	25.0	SEDLD	250						
5	May-Ott	FLOW	25.0	PATHO	25.0	SEDLD	25.0	COMP	16.3				
6	Ott-Mar	COMP	25.0	PATHO	250	SEDLD	25.0						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life ***stages:*** 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Owl Cr - Lick Cr (RM 53.5 -57.4 from Snake R)

Restoration benefit category:	B	Chinook usage score:	426.9	Habitat productivity ioss score:	-231.4

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	8	6	0	0	0	28	28	0	0	0	2.7	-14.0	00
1,2,3	Aug-Oct	10	to	o	0	0	40	40	0	0	0	2.3	-52.4	-314
3	Oct-Mar	20	20	0	0	0	80	80	0	0	0	2.3	-60.0	-176.2
3,4	Mar-May	9	9	0	0	o	22	22	o	0	o	5.2	-220	-7.7
5	May-Oct	25	25	0	0	0	48	48	0	0	0	2.6	-62.0	-15.5
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	5.8	0.0	10
7	Mar-Jun	2	2	0	0	0	0	0	0	0	0	9.1	0.0	0 . 4

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	FLOW	21.8								
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0								
3	Oct-Mar	SEDLD	50.0	PATHO	25.0								
3,4	Mar-May	SEDLD	50.0	FLOW	25.0	PATHO	25.0						
5	May-Oct	FLOW	24.6	PATHO	24.6	SEDLD	24.6						
6	Oct-Mar	COMP	25.0	PATHO	25.0	SEDLD	25.0						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners thst spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

- Level 1: 0-10 spawners
- Levei 2: 10-30 spawners
- Levei 3: 30-60 spawners
- Level 4: > 60 spawners

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - fiow
- HABD - habitat diversity
- NUTLD - nutrient ioad
- OBST - obstruct ions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment ioad
- TEMP - water temperature
- WiTH - water withdraws

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Lick Cr - South Fork (RM 57.4 -58.9 from Snake R)

Restoration benefit category:	B	**Chinook** usage score:	497.7	**Habitat** productivity loss score:	-308.0

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantity	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	12	12	0	0	0	24	24	0	0	0	1.9	0.0	0.0
1,2,3	Aug-Ott	20	20	0	0	0	40	40	0	0	0	1.7	-51.0	-73.1
3	Ott-Mar	40	40	0	0	0	80	80	0	0	0	1.7	-60.0	-213.8
3 4	Mar-May	10	10	0	0	0	20	20	0	0	0	3.6	-21.0	-7.1
5	May-Ott	25	25	0	0	0	46	46	0	0	0	1.9	-60.0	-15.3
6	Ott-Mar	19	19	0	0	0	0	0	0	0	0	4.2	0.0	10
7	Mar-Jun	1	1	0	0	0	0	0	0	0	0	6.7	0.0	0 . 3

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	25.0								
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0								
3	Oct-Mar	SEDLD	50.0	PATHO	12.5								
3,4	Mar-May	FLOW	25.0	PATHO	25.0	SEDLD	25.0						
5	May-Oct	COMP	25.0	FLOW	25.0	PATHO	25.0	SEDLD	25.0				
6	Oct-Mar	COMP	25.0	PATHO	25.0	SEDLD	25.0						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributea indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Mouth - Cow Cr (RM 0.0- 4,3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	132.1	Habitat productivity loss score:	133.8

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity
		Primary					Secondary							
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	Patient quantity	% change	loss score
1	Apr-Aug	35	25	6	4	0	91	63	16	12	0	14.6	0.0	136.8
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	11	6	3	2	0	9.8	0.0	-3.0
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-run	32	21	7	4	0	132	93	21	18	0	45.9	0.0	0 . 0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	8.6										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
	Mar-May	NA	NA		NA	NA		NA		NA	NA	NA	NA
5	May-Ott'	PATHO	13.3				A		A				
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	PRED	7,4										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Cow Cr - Lightning Cr (RM 4.3- 5.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	173.0	Habitat productivity ioss score:	10.8

Life stage	Months	No. iife history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	16	11	3	2	0	44	30	8	6	0	15.7	0.0	76.9
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	0	0	0	0	0	4	4	0	0	0	2.5	-83.3	-4.6
5	May-Ott	0	0	0	0	0	24	21	2	1	0	12.6	0.0	-14.6
6	Ott-Mar	18	18	0	0	0	220	146	37	37	0	31.2	0.0	-46.9
7	Mar-Jun	16	11	3	2	0	39	28	6	5	0	52.4	0.0	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from $t_{emplate}$)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	110										
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	No.	NA
3,4	Mar-May	PATHO	25.0										
5	May-Ott	PATHO	22.0										
6	Ott-Mar	PATHO	7.0	SEDLD	7.0	PRED	6.6						
7	Mar-Jun	PRED	8.7										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

CHEM -	chemicals	NUTLD -	nutrient load	RIPCN -	riparian condition
CSTAB -	channel stability	OBST -	obstructions	SEDLD -	sediment load
COMP -	competition (with other species)	OXYG -	dissolved oxygen	TEMP -	water temperature
FLOW -	flow	PATHO -	pathogens	WiTH -	water withdrawals
HABD -	habitat diversity	PRED -	predators (includes fishing-reiated losses)		

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: **Lightning** Cr - Horse Cr (RM 5.4- 10.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	134.9	Habitat productivity loss score:	153.8

Life stage	Months.	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantii	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	15	10	3	2	0	43	29	8	6	0	144	0.0	1708
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA		NA	NA	%	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	" N A		NA	NA		NA
5	May-Ott	o	0	0	0	0	4	1	2	1	0	12.0	0.0	-0.3
6	Oct-Mar	19	1	18	o	0	66	62	2	2	0	32.0	0.0	-16 6
7	Mar-Jun	16	9	4	3	0	31	24	4	3	0	48.4	0.0	0 . 0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	23.2										
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4,,,,,	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	PATHO	7.5										
6	Ott-Mar	PATHO	68	SEDLD	68	PRED	6.6						
7	Mar-Jun	PRED	9.8										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Levei 1: 0-10 spawners
Level 2 10-30 spawners
Levei 3 30-60 spawners
Levei 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank ceils under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Fence Cr - Big Sheep Cr (RM 16.3 -22.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	132.0	Habitat productivity loss score:	144.0

Life stage	Months	No. life history pathways by current usage abundance level: Primary					Secondary					Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	4	Total no.	1	2	3	4	Patient quantity	% change	
1	Apr-Aug	15	10	3	2	0	43	29	8	6	0	12.0	0.0	150.3
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	
5	May-Oct	1	1	0	0	0	13	7	4	2	0	7.5	0.0	ye
6	Ott-Mar	2	0	1	1	o	82	62	19	1	0	19.8	0.0	-19.9
7	Mar-Jun	12	9	2	1	0	23	16	4	3	0	36.1	0.0	16.6

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	20.4										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	PATHO	8.7										
6	Oct-Mar	PATHO	8.2	RIPCN	8.2	SEDLD	8.2						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 apawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PAT HO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Horse Cr - Fence Cr (RM 10.8 -16.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	133.4	Habitat productivity loss score:	160.4

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	15	10	3	2	0	43	29	8	6	0	12.8	0.0	157.6
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	0	0	0	0	0	4	1	2	1	0	7.5	0.0	-0.9
6	Oct-Mar	20	1	1	18	0	52	48	2	2	0	20.0	0.0	-15.3
7	Mar-Jun	14	9	2	3	0	29	21	5	3	0	34.7	0.0	18.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	21.4										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	PATHO	8.0										
6	Ott-Mar	HABD	7.9	PATHO	7.9	SEDLD	7.9						
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmott/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ffow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present,
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Big Sheep Cr - Freezeout Cr (RM 22.3 -35.2 from Snake R)

Restoration benefit category:	F	Chinook usage score:	224.5	Habitat productivity loss score:	-29.3

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	19	10	7	2	0	59	34	19	6	0	11.9	-83	426
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	3	1	1	1	0	18	9	5	4	0	7.5	0.0	-42
6	Ott-Mar	o	0	0	0	0	132	76	37	19	0	20.3	0.0	-677
7	Mar-Jun	7	4	2	1	0	21	12	5	4	0	34.0	0.0	0.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	24.2	OBST	24.2	PATHO	24.2	PRED	24.2	TEMP	24.2		
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	HABD	22.5	COMP	11.2	FLOW	11.2	PATHO	11.2	RIPCN	11.2	WITH	11.2
6	Oct-Mar	COMP	14.7	FLOW	14.7	PATHO	14.7	RIPCN	14.7	SEDLD	14.7	WITH	14.7
7	Mar-Jun	WITH	12.2										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Freezeout Cr - Grouse Cr (RM 35.2 -40.6 from Snake R)

Restoration benefit category:	D	Chinook usage score:	134.8	Habitat productivity loss score:	-109.8

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	10	5	3	2	0	31	17	8	6	0	11.5	-03	-34.5
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	""oct:Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	o	0	0	0	0	20	16	4	0	0	1.8	-35.1	-35.3
5	May-Ott	3	1	1	1	0	129	100	25	4	o	9.5	-1.4	-30.
6	Oct-Mar	0	o	0	0	0	39	20	1	18	0	20.3	-0.7	-9.6
7	Mar-Jun	7	4	2	1	0	7	"4"	1	2	0	33.4	-3.8	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	96 change
1	Apr-Aug	HABD	16.0	OBST	16.0	PATHO	16.0	PRED	16.0	TEMP	16.0		
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	NA	?
3,4	Mar-May	HABD	20.6	COMP	10.3	CSTAB	10.3	FLOW	1	PATHO	10.3	RIPCN	
5	May-Ott	HABD	20.2	COMP	10.1	FLOW	"1O.I	PATHO	10.1	RIPCN	10.1	WiTH	10.1
6	Ott-Mar	COMP	7.6	FLOW	7.6	PATHO	7.6	RIPCN	7.6	SEDLD	7.6	WiTH	7.6
7	Mar-Jun	WiTH	11.2										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Level 3: 30-60 spawners
- Levei 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.'
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment ioad
- TEMP - water temperature
- WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Grouse Cr - Summit Cr (RM 40.6 -43.6 from Snake R)

Restoration benefit category:	F	Chinook usage score:	57.3	Habitat productivity loss score:	-57.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	10	5	3	2	0	31	17	8	6	0	12.8	0.0	-45.2
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	o	o	0	0	0	" 5	4	1	0	o	1.9	-34.4	-83
5	May-Ott	3	1	1	1	0	20	10	6	4	0	7.5	0.0	-3.0
6	Ott-Mar	o	0	0	0	0	1	0	0	1	0	18.8	0.0	-0.5
7	Mar-Jun	7	4	2	1	0	5	3	1	1	0	36.2	0.0	0 . 0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Aft 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	172	OBST	17.2	PATHO	17.2	PRED	1.72	TEMP	17.2		
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	N	NA	NA	N	NA	NA	NA
3,4	Mar-May	COMP	10.3	HABD	10.3	PATHO	10,3	RIPCN	10,3	WITH	10.3		
5 ' "	May-Ott	HABD	13.3	COMP	"' 6.7' "'	FLOW	6.7'	PATHO	6.7	RIPCN	6.7	SEDLD	6.7
6	Ott-Mar	COMP	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0	SEDLD	25.0	WITH	25.0
7	Mar-Jun	WITH	7.5										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the iife history pathways using the reach in this table:

Levei 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: **Summit Cr** - Crazyman Cr **(RM 43.6 -49.4** from Snake R)

Restoration benefit category:	D	Chinook usage score:	163.6	Habitat productivity loss score:	-143.5

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary						Secondary				Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	10	5	3	2	0	31	17	8	6	0	10.8	-3.6	-42.6
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	o	0	0	0	0	33	4	17	12	0	1.7	-24.0	-404
5	May-Ott	3	1	1	1	0	97	10	94	93	0	8.6	-1.1	-30.7
6	Ott-Mar	o	0	0	0	0	75	37	19	19	0	18.3	0.0	-29.7
7	Mar-Jun	7	4	2	1	0	5	3	1	1	0	29.7	0.0	0.0

		Highest productivity impact attribute						(% change in impact from template)					
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	16.2	OBST	16.2	PATHO	16.2	PRED	16.2	TEMP	16.2		
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	HABD	13.3	CSTAB	8.7	FLOW	8.7	COMP	6.6	PATHO	6.6	RIPCN	6.6
5	May-Oct	HABD	13.5	COMP	6.7	FLOW	6.7	PATHO	6.7	RIPCN	6.7	WITH	6.7
6	Oct-Mar	COMP	11.3	FLOW	11.3	PATHO	11.3	RIPCN	11.3	SEDLD	11.3	WITH	11.3
7	Mar-Jun	WITH	9.7										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Crazyman Cr - Gumboot Cr (RM 49.4 -52,7 from Snake R)

Restoration benefit category: E [Chinook usage score: 448.8 | Habitat productivity loss score: 64.0]

Life stage	Months	No. life history pathways by current usage abundance level: Primary Total no.	Primary 1	Primary 2	Primary 3	Primary 4	Secondary Total no.	Secondary 1	Secondary 2	Secondary 3	Secondary 4	Key habitat change: Patient quantity	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	15	5	8	2	0	46	17	23			10.0	-3.3	0.0
1,2,3	Aug-Oct	10	0	10	0	0	30	0	30			7.7	-51.0	-1.4
3	Oct-Mar	20	0	20	0	0	60	0	60	0	0	8.3	-58.9	-8.0
34	Mar-May	8	0	8	0	0	30	4	22	4	0	10.3	-34.2	-23.5
5	""May:oz'	28	1	26	1	0	60	1	47	2	0	8.9	-3.5	-16.6
6	"'oct:tiai"'	19	0	19	0	0	1		0	0	0	20.8	2.7	-14.5
7	Mar-Jun	7	4	2	1	0	1	1	0	0	0	35.8	3.7	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	12.9	OBST	12.9	PATHO	12.9	SEDLD	12.9				
1,2,3	Aug-Oct	HABD	25.0	PRED	25.0	SEDLD	25.0	OBST	12.5	PATHO	12.5		
3	Oct-Mar	COMP	25.0	PATHO	25.0								
3,4	Mar-May	COMP	25.0	FLOW	25.0	PATHO	25.0						
5	May-Oct	FLOW	25.0	PATHO	25.0	TEMP	10.3						
6	Oct-Mar	PATHO	25.0	TEMP	24.4								
7	Mar-Jun	PATHO	11.1										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Gumboot Cr - Dry Cr (RM 52.7 -55.4 from Snake R)

Restoration benefit category:	B	Chinook usage score:	774.0	Habitat productivity loss score:	-122.1

		No. life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	loss score
1	Apr-Aug	19	15	2	2	0	53	42	5	6	0	10.4	-1.7	0.0
1,2,3	Aug-Oct					0	50	50	0	0	0	7.7	-51.0	-45.8
3	Ott-Mar					0	100	100	0	0	0	7.7	-61.1	-14.1
3,4	Mar-May	20				0	32	24	4	4	0	8.9	-33.6	-1.5
5	May-Oct	75	73	1	1	0	80	77	1	2	0	9.2	-2.0	-31.4
6	Oct-Mar	38	38	0	0	0	1	1	0	0	0	19.3	-2.7	-28.7
7	Mar-Jun			4	1	1	1	1	0	0	0	30.3	-3.8	-0.6

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	20.8	SEDLD	20.8	PRED	6.3						
1,2,3	Aug-Oct	HABD	18.7	SEDLD	16.7	PRED	8.3						
3	Ott-Mar	PATHO	12.5										
3,4	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Oct	FLOW	23.4	PATHO	23.4								
6	Ott-Mar	PATHO	24.6	TEMP	24.6								
7	Mar-Jun	PRED	11.5										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Dry Cr - Skookum Cr (RM 55.4 -61.9 from Snake R)

Restoration benefit category:	E	Chinook usage score:	842.3	Habitat productivity ioss score:	-92.5

Life stage	Months	No, life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantii	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	17	3	12	2	0	48	12	30	6	0	9.4	0.0	0.0
1,2,3	Aug-Ott	20	0	20	0	0	50	0	50	0	0	7.7	-52.8	-41.2
3	Ott-Mar	40	o	40	0	0	100	0	100	0	0	7.7	-60.0	
34	Mar-May	21	5	16	‘ o	0	34	14	16	‘4	0	8.3	-265	
5	May-Ott	74	25	48	1	0	100	75	23	2	0	8.6	-1.5	-366
6	Ott-Mar	38	19	19	0	0	0	0	0	0	0	193	00..	-285
7	Mar-Jun	4	2	1	1	0	1	1	0	0	0	30.3	0.0	- 0 . 6

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	19.7	SEDLD	19.7								
1,2,3	Aug-Oct	HABD	25.0	PRED	25.0	SEDLD	25.0						
3	Oct-Mar	""PATHO-	25.0										
34	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Ott	FLOW	25.0	PATHO	25.0	TEMP	15,4						
6	Ott-Mar	PATHO	25.0	PRED	25.0	TEMP	25.0						
7	Mar-Jun	PRED	15.2										

Abundance level refera to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathwaya using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 apawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmoft/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no fife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: **Blue Hole - forks** (RM 66.4 -71.4 from Snake R)

Restoration benefit category:	E	Chinook usage score:	495.0	Habitat productivity loss score:	45.6

Life stage	Months	No. life history pathways by current usage abundance level: Primary: Total no.	Primary: 1	Primary: 2	Primary: 3	Primary: 4	Secondary: Total no.	Secondary: 1	Secondary: 2	Secondary: 3	Secondary: 4	Key habitat change: Patient quantity	Key habitat change: % change	Habitat productivity loss score
1	Apr-Aug	8	8	0	0	0	42	42	0	0	0	7.8	-6.3	11.3
1,2,3	Aug-Oct	10	10	0	0	0	60	80	0	0	0	6.2	-6.1	46.9
3	Ott-Mar	20	20	o	o	0	120	120	0	0	0	6.2	0.0	0.0
34	Mar-May	3	3	o	o	o	39	39	0	0	0	7.0	0.0	-12.9
5	May-Ott	o	0	0	0	o	97	97	0	0	0	7.4	-4.4	0.0
6	Oct-Mar	0	0	0	0	0	19	19	0	0	0	8.2	0.0	0.0
7	Mar-Jun	1	1	0	0	0	1	1	0	0	0	24.2	0.0	0.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Oct												
3	Oct-Mar	PATHO	25.0										
3,4	Mar-May	PATHO	25.0										
5	May-Oct	PATHO	24.5										
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Skookum Cr - Blue Hole (RM 61.9 -66.4 from Snake R)

Restoration benefit category:	E	Chinook usage score:	753.4	Habitat productivity loss score:	-84.8

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	15	3	0	12	0	46	12	0	36	0	9.2	0.0	0.0
1,2,3	Aug-Ott	20	0	0	20	0	60	0	0	60	0	7.7	-51.0	-49.7
3	Ott-Mar	40	0	0	40	0	120	0	0	120	0	7.7	-60.0	0.3
34	Mar-May	18	2	0	16	0	29	5	0	24	0	8.7	-31.9	0.1
5	May-Ott	48	0	0	48	0	52	6	0	46	0	8.7	0.0	-20.8
6	Ott-Mar	19	0	0	19	0	0	0	0	0	0	19.3	0.0	-14.3
7	Mar-Jun	2	1	0	1	0	1	1	n	n	0	30.3	0.0	-0.3

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	21.5	SEDLD	21.5	PRED	8.3						
1,2,3	Aug-Oct	HABD	16.7	SEDLD	16.7	PRED	8.3						
3	Oct-Mar	PATHO	12.5										
3,4	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Oct	FLOW	24.1	PATHO	24.1								
6	Oct-Mar	PATHO	25.0	TEMP	25.0								
7	Mar-Jun	PRED	14.9										

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life *stages:* 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes frshing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: South Fork Imnaha R (RM 71.4 -76.1 from Snake R)

Restoration benefit category:	E	Chinook usage score:	613.2	Habitat productivity loss score:	52.9

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
Life stage	Montha	Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	12	12	0	0	0	36	36	0	0	0	5.0	-56	117
123	Aug-Ott	20	20	0	0	0	60	60	0	0	0	4.6	0.0	536
3	Ott-Mar	40	40	0	0	0	t 20	120	0	0	0	4.6	0.0	00
34	Mar-May	10	10	0	0	0	30	30	0	0	0	5.0	0.0	-12.5
5	May-Ott	25	25	0	0	0	69	69	0	0	0	5,0	-2.6	0.0
6	Ott-Mar	19	19	0	0	0	0	0	0	0	0	4.6	0.0	00
7	Mar-Jun	1	1	0	0	0	0	0	0	0	0	18.2	0.0	0.0

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Oct												
3	Oct-Mar	PATHO	12.5										
3,4	Mar-May	PATHO	16.3										
5	May-Oct	PATHO	25.0										
6	Oct-Mar	PATHO	25.0										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling preamott/smelt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawal

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attribute with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Lightning Cr.
Reach: Mouth - forks (RM 5.4- 13.9 from Snake R)

Restoration benefit category:	F	Chinook usage score:	108.7	Habitat productivity ioss score:	14.5

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary							
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	Patient quantity	% change	
1	Apr-Aug	9	9	0	0	0	9		0		0	0.6	0.0	
1,2,3	Aug-Oct	10	10	0	0	0	10	9	0		0	0.4	0	
3	Oct-Mar	20	20	0	0	0	20	20	0		0		3	
3,4	Mar-May	8	8	Q	o	0	4	4	o	0	0	0.6	6.3	3.2
5	May-Oct	25	25	0	0	0	0	0	0	0	0	0.5	0.0	0.0
6	Oct-Mar	19	19	0	0	0	0	0	0	0	0	0.5	16	1.6
7	Mar-Jun	3	3	0	0	0	0	0	0	0	0	13.2	4.8	0.4

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	15.2										
1,2,3	Aug-Oct	FLOW	5.5										
3	Oct-Mar	PATHO	8.2										
3,4	Mar-May	COMP	7.8	PATHO	7.8								
5	May-Oct	COMP	7.8	PATHO	7.8								
6	Oct-Mar	PATHO	7.8										
7	Mar-Jun												

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Level 3: 30-60 spawners
- Level 4 > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WiTH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Mouth - Bear Gulch (RM 25.4 -28.5 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity ioss score:	0.0

Life stage	Months	No. life history pathwsys by current usage abundance level										Key habitat change		Habitat productivity 10ss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA'	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	Y?	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5 "	May-Ott	NA	NA	NA	NA	N A	NA	" N A	N A	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

- Level 1: 0-10 spawners
- Level 2 10-30 spawners
- Level 3 30-60 spawners
- Level 4 > 60 spawners

Life *stages*: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - fiow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissoived oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment ioad
TEMP - water temperature
WiTH - water withdrawsis

"NA" indicates that no fife history pathway meeting the criteria used in defining these pathways was present.
Blank ceils under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Bear Gulch - Devil's Gulch (RM 28.5 -30.9 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	[Habitat productivity loss score:	0.0]

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss soore
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Life stage	Montha	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA		NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	%		%
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA			
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ffow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Devil's Gulch - Lightning Cr (RM 30.9 -33.1 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

		No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient		
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
123	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	%	NA	
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA	
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2: 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life *stages:* 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdraws

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Lightning Cr - Hayden Cr (RM 33.1 -38.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity loss score:	0.0

		No, life history pathways by current usage abundance level										Key habitat change		Habitat
		Primary					Secondary					Patient		productivity
Life stage	Months	Total no.	1	2	3	4	Total no.	1	2	3	4	quantity	% change	10ss score
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

		Highest productivity impact attributes (% change in impact from template)											
Life stage	Months	Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May,	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
5	May-Ott	NA	NA	NA	NA	NA	NA	" N A	A""	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to the average abundance of spawners that spawn in the natal stream reaches that populate the life history pathways using the reach in this table

Level 1: 0-10 spawners
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4: > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Primary and Secondary Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Hayden Cr - McCully Cr (RM 38.8 -48.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.0	Habitat productivity ioss score:	0.0

Life stage	Months	No. life history pathways by current usage abundance level										Key habitat change		Habitat productivity loss score
		Primary					Secondary					Patient quantity	% change	
		Total no.	1	2	3	4	Total no.	1	2	3	4			
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	N A	NA	N A	NA??	NA	NA	NA	NJ	NJ	NA	NA
5	May-Ott"	NA	NA	NA	NA	N	NA	NA		NA				?
8	Ott-Mar	NA	NA	NA	NA	NA	NA	NA		NA	NA	NA		
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N A

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
1,23	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
5	May-Oct	NA	" NA	NA	NA	NA	NA	NA	NA	NA	NA		NA
6	Ott-Mar	NA	NA		NA	NA		NA	NA	%			NA
7	Mar-Jun	NA	NA		NA	NA		NA	NA				NA

Abundance level refers to the average abundance of spawnera that spawn in the natal stream reaches that populate the life history pathways using the reach in this table:

Level 1: 0-10 spawnera
Level 2 10-30 spawners
Level 3: 30-60 spawners
Level 4 > 60 spawners

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient ioad
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

APPENDIX G

Imnaha Stream **Reach** Summaries
for **Vacant** Life History Pathways

Reaches analyzed in the Imnaha, listed in the order they appear in Appendix G.

stream	Reach	Benefit Category for Vacant Life History Pathways
Big Sheep Cr.	Mouth - Camp Cr (RM 22.3 -23.4 from Snake R)	D
Big Sheep Cr.	Camp Cr - Little Sheep Cr (RM 23.4 -25.4 from Snake R)	D
Big Sheep Cr.	Little Sheep Cr - Squaw Cr (RM 25.4 -37.7 from Snake R)	B
Big Sheep Cr.	Squaw Cr - Marr Cr (RM 37.7 -39.3 from Snake R)	D
Big Sheep Cr.	Marr Cr - Griffith Cr (RM 39.3 -45.3 from Snake R)	B
Big Sheep Cr.	Griffith Cr - Carrel Cr (RM 45.3 -47.0 from Snake R)	F
Big Sheep Cr.	Carrol Cr - Owl Cr (RM 47.0 -53.5 from Snake R)	F
Big Sheep Cr.	Owl Cr - Lick Cr (RM 53.5 -57.4 from Snake R)	F
Big Sheep Cr.	Lick Cr - South Fork (RM 57.4 -58.9 from Snake R)	F
Imnaha R.	Mouth - Cow Cr (RM 0.0- 4.3 from Snake R)	A
Imnaha R.	Cow Cr - Lightning Cr (RM 4.3- 5.4 from Snake R)	F
Imnaha R	Lightning Cr - Horse Cr (RM 5.4- 10.S from Snake R)	E
Imnaha R.	Fence Cr - Big Sheep Cr (RM 16.3 -22.3 from Snake R)	F
Imnaha R.	Horse Cr - Fence Cr (RM 10.8 -16.3 from Snake R)	E
Imnaha R.	Big Sheep Cr - Freezeout Cr (RM 22.3 -35.2 from Snake R)	E
Imnaha R.	Freezeout Cr - Grouse Cr (RM 35.2 -40.6 from Snake R)	E
Imnaha R.	Grouse Cr - Summit Cr(RN440.6 -43.6 from Snake R)	E
Imnaha R.	Summit Cr - Crazyman Cr (RM 43.6 -49.4 from Snake R)	F
Imnaha R.	Crazyman Cr - Gumboot Cr (RM 49.4 -52.7 from Snake R)	F
Imnaha R.	Gumboot Cr - Dry Cr (RM 52.7 -55.4 from Snake R)	F
Imnaha R	Dry Cr - Skookum Cr (RM 55.4 -61.9 from Snake R)	F
Imnaha R.	Blue Hole - forks (RM 66.4 -71.4 from Snake R)	F
Imnaha R.	Skookum Cr - Blue Hole (RM 61.9 -66.4 from Snake R)	F
Imnaha R.	South Fork Imnaha R (RM 71.4 -76.1 from Snake R)	F
Lightning Cr.	Mouth - forks (RM 5.4- 13.9 from Snake R)	F
Little Sheep Cr.	Mouth - Bear Gulch (RM 25.4 -28.5 from Snake R)	D
Little Sheep Cr.	Bear Gulch - Devil's Gulch (RM 28.5 -30.9 from Snake R)	D
Little Sheep Cr.	Devil's Gulch - Lightning Cr (RM 30.9 -33.1 from Snake R)	D
Little Sheep Cr.	Lightning Cr - Hayden Cr (RM 33.1 -38.8 from Snake R)	B
Little Sheep Cr.	Hayden Cr - McCully Cr (RM 38.8 -48.8 from Snake R)	B

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Mouth - Camp Cr (RM 22.3 -23.4 from Snake R)

Restoration benefit category:	D	Chinook usage score:	19.9	Habitat productivity loss score:	-5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	68	57	11	0	5.3	0.0	-85.4
123	Aug-Ott	30	30	0	0	2.9	0.0	-92.4
3	Ott-Mar	60	60	0	0	3.1	??	-171.3
34	Mar-May	29	26	3	0	2.1	-36.4	-120.8
5	May-Ott	71	67	4	0	3,7	0.0	-116.2
6	Ott-Mar	21	20	1	0	7.8	0.0	-8.7
7	Mar-Jun	15	12	3	0	14.8	0.0	12.1

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Art 5	% change	Att 6	%
1	Apr-Aug	FLOW	17.7	TEMP	17.7	RIPCN	17.2	SEDLD	17.2	HABD	8.8		
1,2,3	Aug-Ott	CSTAB	35.4	TEMP	35.4	FLOW	17.7	SEDLD	17.7	HABD	8.8	RIPCN	
3	Ott-Mar	CSTAB	35.4	TEMP	3s.4	HABD	17.7	SEDLD	17.7	COMP	8.8	FLOW	
34	Mar-May	TEMP	28.1	CSTAB	20.2	HABD	20.2	SEDLD	20.2	COMP	14.0	PATHO	
5	May-Ott	TEMP	27.3	CSTAB	"17.3	FLOW	17.3	PATHO	17.3	WITH	17.3	COMP	
6	Ott-Mar	CSTAB	4.2	FLOW	4.2	PAT HO	4.2	TEMP	4.2	WITH	4.2		
7	Mar-Jun	WITH	15,9										

Abundance level refera to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways us

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian cond
SEDLD - sediment loa
TEMP - water temper
WITH - water withdra

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Camp Cr - Little Sheep Cr (RM 23.4 -25,4 from Snake R)

Restoration benefit category: D	**Chinook** usage score: 37.9	Habitat productivity loss score: -1

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	65	54	11	0	6.1	-4.8	-111.7
1,2,3	Aug-Oct	30	30	0	0	5.1	0.0	-130.5
3	Ott-Mar	60	60	0	0	5.3	0	-2420
34	Mar-May	40	37	3	0	2.6	-57.4	-232.8
5	May-Ott	136	132	4	0	5.6	-2.2	-379.5
6	Ott-Mar	40	39	1	0	13.1	0.0	-107.0
7	Mar-Jun	14	11	3	0	20.7	0,0	12.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		An 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	%
1	Apr-Aug	TEMP	37.5	CSTAB	25.0	FLOW	22.5	RIPCN	22.5	SEDLD	22.5	HABD	
1,2,3	Aug-Oct	CSTAB	50.0	TEMP	50.0	FLOW	25.0	RIPCN	25.0	SEDLD	25.0	HABD	
3	Ott-Mar	CSTAB	50.0	HABD	50.0	TEMP	50.0	COMP	25.0	FLOW	2 s 0	PATHO	
3,4	Mar-May	CSTAB	50.0	HABD	50.0	TEMP	50.0	COMP	25.0	FLOW	25.0	PATHO	
5	May-Ott	TEMP	47.0	COMP	23.5	HABD	23.5	PATHO	235	SEDLD	23.5		
6	Ott-Mar	WITH	25.0	CSTAB	2 4 . 1	FLOW	24.1	PATHO	24,1	TEMP	24.1		
7	Mar-Jun	WITH	17.6										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways us

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian cond
SEDLD - sediment loa
TEMP - water temper
WITH - water withdra

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Little Sheep Cr - Squaw Cr (RM 25.4 -37.7 from Snake R)

Restoration benefit category:	B	Chinook usage score:	62.1	Habitat productivity loss score:	-1585.7

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	90	55	35	0	10.4	-14.9	-172.0
1,2,3	Aug-Oct	50	0	50	0	5.7	0.0	-217.5
3	Oct-Mar	100	0	100	0	6.2	0.0	-403.3
3,4	Mar-May	70	45	25	0	3.2	-38.8	-267.2
5	May-Oct	259	211	48	0	8.0	-4.0	-417.0
6	Oct-Mar	76	57	19	0	15.6	0.0	-113.7
7	Mar-Jun	7	6	1	0	27.2	0.0	5.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	TEMP	25.0	RIPCN	23.8	SEDLD	23.8	HABD	12.5		
1,2,3	Aug-Oct	CSTAB	50.0	TEMP	50.0	FLOW	25.0	SEDLD	25.0	HABD	12.5	RIPCN	12.5
3	Oct-Mar	CSTAB	50.0	TEMP	50.0	HABD	25.0	SEDLD	25.0	COMP	12.5	FLOW	12.5
3,4	Mar-May	TEMP	24.8	CSTAB	20.1	HABD	20.1	SEDLD	20.1	COMP	12.4	PATHO	12.4
5	May-Oct	TEMP	25.0	CSTAB	14.5	FLOW	14.5	PATHO	14.5	WITH	14.5	COMP	12.5
6	Oct-Mar	CSTAB	13.5	FLOW	13.5	PATHO	13.5	TEMP	13.5	WITH	13.5		
7	Mar-Jun	WITH	14.0										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank ceils under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Squaw Cr - Marr Cr (RM 37.7 -39,3 from Snake R)

Restoration benefit category:	D	Chinook usage score:	35.7	Habitat productivity loss score:	-1398.4

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	50	50	0	0	4.5		-132.9
1,2	Aug-Oct	60	0p		0	3.0		-261.0
3	Oct-Mar	120	120		0	3.2		-483.9
34	Mar-May	39	39	0	0	1.9	:47.!5	246.8
5	May-Ott	75	75	0	0	4.1	-5.7	-221.4
6	Ott-Mar	19	19	0	0	8.0	0.0	-52.8
7	Mar-Jun	2	2	0	0	13.2	0.0	0.4

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Atf 2	% change	An 3	% change	Att 4	% change	An 5	% change	Att 6	% change
1	Apr-Aug	TEMP	37.5	CSTAB	25.0	FLOW	21.3	RIPCN	21.3	SEDLD	21.3	HABD	12.5
1,2,3	Aug-Ott	CSTAB	50.0	TEMP	50,0	FLOW	25.0	RIPCN	25.0	SEDLD	25.0	HABD	12.5
3	Ott-Mar	CSTAB	50.0	HABD	50.0	TEMP	50.0	COMP	25.0	FLOW	250	PATHO	25.0
3,4.	Mar-May	CSTAB	50.0	TEMP	50.0	HABD	43.9	COMP	25.0	PATHO	250	SEDLD	25.0
5	May-Ott	TEMP	48.8	COMP	24.4	"HA60"	24.4	PATHO	24.4	SEDLD	244		
6	Ott-Mar	CSTAB	25.0	FLOW	25.0	PATHO	25.0	TEMP	25,0	WITH	25.0		
7	Mar-Jun	WITH	18.7										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the tife history pathways using the reach in this **table:**

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Marr Cr - Griffith Cr (RM 39.3 -45.3 from Snake R)

Restoration benefit category:	B	Chinook usage score:	46,1	Habitat productivity loss score:	-1447.6

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	44	44	0	0	4.9	-20.4	-130.4
1,2,3	Aug-Oct	60	60	0	0	3.5	-5.0	-261.0
3	Oct-Mar	120	120	0	0	3.7	-2.4	-483.9
3,4	Mar-May	44	44	0	0	2.0	-51.8	-268.2
5	May-Oct	111	111	0	0	4.9	-10.0	-251.6
6	Oct-Mar	19	19	0	0	9.2	-2.6	-52.8
7	Mar-Jun	1	1	0	0	15.2	-7.7	0.3

	M												
	-Aug		50										
	M M												
	M												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1. prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Griffith Cr - Carrel Cr (RM 45.3 -47.0 from Snake R)

Restoration benefit category:	F	Chinook usage score:	12.2	Habitat productivity loss score:	-131.9

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no,	1	2	3	Patient quantiiy	% change	
1	Apr-Aug	23	23	0	0	,,,4,1..,	-6.6	0.0
1,2 3	Aug-Ott	30	30	0	0	2.7	-51.0	-18.8
3	Ott-Mar	60	60	0	0	2.8	-60.0	-106.9
34	Mar-May	11	11	0	0	5.5	-280	-6.1
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	An 2	% change	Art 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	SEDLD	37.5	FLOW	77.0								
1,2,3	Aug-Ott	SEDLD	50.0	FLOW	25.0								
3	Ott-Mar	SEDLD	50.0	PATHO	25.0								
,, 3,4	Mar-May	SEDLD	,50.0	PATHO	21.3								
5	May-Ott	NA	NA	N A	NA	"NA	NA	"NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways *using* the **reach** in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation: 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Carrel Cr - Owl Cr (RM 47.0 -53.5 from Snake R)

Restoration benefit category:	F	Chinook usage score:	14.5	Habitat productivity loss score:	-130.1

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
	Jd	20	20	0	0	3.8	-1	
	M							
	M M							
	M							
	M							

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Atf 2	% change	An 3	% change	Atf 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	24,6	SEDLD	24.6								
,,1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0								
3	Ott-Mar	SEDLD	50.0	PATHO	12.5								
34	Mar-May	SEDLD	22.7	PATHO	11.4								
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Owl Cr - Lick Cr (RM 53.5 -57.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	3.9	Habitat productivity loss score	-43.7

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	7	7	0	0	2.7	-14.3	0.0
1,2,3	Aug-Oct	10	10	0	0	2.3	-52.4	-6.3
3	Oct-Mar	20	20	0	0	2.3	-60.0	-35.6
3,4	Mar-May	3	3	0	0	4.3	-30.0	-1.8
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Art 5	% change	Atf 6	% change
1	Apr-Aug	SEDLD	???	FLOW	22.3								
1,2,3	Aug-Ott	SEDLD	50.0	FLOW	25.0								
3	Oct-Mar	SEDLD	50.0	PATHO	25.0								
3,4	Mar-May	SEDLD	50.0	PATHO	25.0								
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach *in* this **table:**

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Big Sheep Cr.
Reach: Lick Cr - South Fork (RM 57.4 -58.9 from Snake R)

Restoration benefit category:	F	[Chinook usage score:	3.8	Habitat productivity loss score:	-49.0

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	6	6	0	0	1.9	0.0	0.0
1,2,3	Aug-Oct	10	10	0	0	1.7	-51.0	-12.2
3	Oct-Mar	20	20	0	0	1.7	-60.0	-35.6
3,4	Mar-May	2	2	0	0	3.2	-30.0	-1.2
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from templat											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	25.0	SEDLD	25.0								
1,2,3	Aug-Oct	SEDLD	50.0	FLOW	25.0								
3	Oct-Mar	SEDLD	50.0	PATHO	12.5								
3,4	Mar-May	SEDLD	25.0	PATHO	12.5								
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance /eve/ refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated th ! life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearlingpresmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Mouth - Cow Cr (RM 0.0- 4.3 from Snake R)

Restoration benefit category:	F	Chinook usage score:	39.0	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	168	136	32	0	14.6	0.0	400.0
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	N A ' " "
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	NA	NA	NA	NA	NA	NA	NA
5	May-Oct	42	35	7	0	9.8	0,0	-12.4
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	215	170	45	o	45.8	0.0	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Aft 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Atf 6	% change
1	Apr-Aug	PATHO	18.9										
1,2,3	Aug-Oct	NA	NA	' A	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	" N A	NA	NA	NA	NA	NA	N A	NA	NA	" " " NA	NA	NA
3,4	Mar-May	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	N
5	May-Ott	PATHO	19.2										
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	PRED	19.6										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Cow Cr - Lightning Cr (RM 4.3- 5.4 from Snake R)

Restoration benefit category:	E	Chinook usage score:	54.6	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	81	65	16	0	15.7	0.0	223.9
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	4	2	2	1	2.	-83.	-4.6
5	May-Ott	40	36	4	0	12	0.0	-21.4
6	Ott-Mar	375	300	75	0	31.1	0.9	-203.2
7	Mar-Jun	60	48	12	0	52.0	0.7	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	An 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	22.6										
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
>. ,3,4..	Mar-May	PATHO	25.0										
5	May-Ott	PATHO	21.1										
6	Ott-Mar	PATHO	20.1	SEDLD	20.1	PRED	18.4						
7	Mar-Jun	PRED	19.2										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
N UTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Lightning Cr - Horse Cr (RM 5.4- 10.8 from Snake R)

Restoration benefit category:	F	Chinook usage score:	32.0	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	111	86	25	0	14.4	0.0	320.5
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	9	9	0	0	2.2	-83.3	-10.3
5	May-Oct	62	57	5	0	12.6	-1.5	-40.2
6	Oct-Mar	92	70	22	0	31.8	0.2	-44.9
7	Mar-Jun	52	42	10	0	48.4	0.3	0.0

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	24.1										
1,2,3	Aug-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4,..	Mar-May	PATHO	25.0	CSTAB	12.5								
5	May-Oct	PATHO	22.4										
6	Ott-Mar	PATHO	17.4	SEDLD	17.4	PRED	16.9						
7	Mar-Jun	PRED	19.4										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Fence Cr - Big Sheep Cr (RM 16.3 -22.3 from Snake R)

Restoration benefit category:	E	Chinook usage score:	83.6	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	130	109	21	0	111	0.0	-534
1,2,3	Aug-Oct	30	30	0	0	31	-58.3	-30
3	Ott-Mar	60	60	0	0	1.3	-83.3	-124.3
3,4	Mar-May	62	45	17	0	1.7	-833	-71.0
5	May-Ott	265	191	74	0	9.0	-0.2	-202.0
6	Ott-Mar	151	114	37	0	19.9	-3.9	-95.6
7	Mar-Jun	34	28	6	0	34.0	-15	25.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	At! 4	% change	Att 5	% change	Aft 6	% change
1	Apr-Aug	PATHO	22.9	TEMP	8.3	CSTAB	8.3						
1,2,3	Aug-Ott	CSTAB	25.0	TEMP	8.3	PATHO	8.3						
3	Oct-Mar	CSTAB	25.0	PATHO	12.5								
3,4	Mar-May	CSTAB	25.0	PATHO	25.0								
5	May-Ott	PATHO	24.2										
6	Oct-Mar	PATHO	19.9	RIPCN	19.9	SEDLD	19.9						
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the **reach in this table**

Level 1: **Low to average (relative to other reaches) abundance**
Level 2: **High (relative to other reaches) abundance**
Level 3: **Exceptionally high (relative to other reaches) abundance**

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Horse Cr - Fence Cr (RM 10.8 -16.3 from Snake R)

Restoration benefit category:	E	Chinook usage score:	43.7	Habitat productivity loss score:	######

		No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity
		7-'-'10.	1	2	3	Patient quantity	% chang	
	M M 00		85	20	0	12.6	0.0	

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Art 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	PATHO	23.9										
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3"	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	CSTAB	25.0	PATHO	25.0	RIPCN	25.0						
5	May-Oct	PATHO	23.5	HABD	22.3	SEDLD	22.3						
6	Oct-Mar	HABD	24.4	PATHO	24.4	SEDLD	24.4						
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
Level 1: Low to average (relative to other reaches) abundance
Level 2 High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2. spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes; CHEM - chemicals
CSTAB - channel stability
COMP - *competition* (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Big Sheep Cr - Freezeout Cr (RM 22,3 -35.2 from Snake R)

Restoration benefit category:	E	Chinook usage score:	70.3	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways on abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	85	51	34	0	12.4	-12.2	-129.1
1,2,3	Aug-Oct	40	0	40	0	3.2	-59.4	-133.6
3	Oct-Mar	80	0	80	0	1.4	-83.3	-237.5
3,4	Mar-May	52	30	22	0	1.7	-77.1	-167.1
5	May-Oct	193	144	49	0	9.9	-6.3	-96.6
6	Oct-Mar	76	57	19	0	20.3	-7.9	-86.0
7	Mar-Jun	11	9	2	0	[illegible]	-0.6	[illegible]

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CSTAB	25.0	FLOW	250	HABD	24.9	OBST	24,9	PATHO	24.9	PRED	249
1,2,3	Aug-Oct	CSTAB	50,0	FLOW	50.0	HABD	25.0	PATHO	25.0	PRED	25.0	SEDLD	25.0
"3	Ott-Mar	CSTAB	500	FLoW	50.0	COMP	25.0	HABD	25.0	PATHO	25.0	RIPCN	25.0
3,4	Mar-May	CSTAB	50.0	FLOW	50.0	HABD	50.0	COMP	25.0	PATHO	25.0	RIPCN	25.0
5	May-Ott	HABD	49.8	COMP	24.9	FLOW	24.9	PATHO	24.9	RIPCN	24.9	WITH	24.9
6	Ott-Mar	COMP	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0	SEDLD	250	WITH	25.0
7	Mar-Jun	WITH	25.0										

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathwsy meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Freezeout Cr - Grouse Cr (RM 35.2 -40.6 from Snake R)

Restoration benefit category: E [Chinook usage score: 50.1 |Habitat productivity loss score: #######|

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	45	44	1	0	***10.3***	***-4.9***	***-86.2***
1 2 3	Aug-Ott	50	50	0	0	3.2	***-59.4***	-167.1
3	Ott-Mar	100	100	0	0	1.4	-83.7	-296.8
34	Mar-May	44	44	0	0	1.7	-83.1	-1794
5	May-Ott	148	147	1	0	96	-3.7	-83.3
6	Ott-Mar	38	38	0	0	203	-2.6	-33.2
7	Mar-Jun	4	4	0	0	33.0	-6.2	0.5

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												W	
		W											

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

- **Level 1:** Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6-overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Grouse Cr - Summit Cr (RM 40.6 -43.6 from Snake R)

Restoration benefit category: F [Chinook usage score: 31.6 | **Habitat productivity loss score:** #######

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity		Habitat productivity
1	Apr-Aug	40	39	1	0	10.5	-	
1,2,3	Aug-Oct	50	50	0	0	3.2	-58.3	-167.1
3	Oct-Mar	100	100	0	0	1.4	-83.3	-296.8
3,4	Mar-May	33	33	0	0	1.8	-80.8	-132.0
5	May-Oct	75	74	1	0	9.9	0.0	-41.3
6	Oct-Mar	19	19	0	0	20.5	0.0	-16.6
7	Mar-Jun	2	2	0	0	35.8	2.4	0.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	CSTAB	25.0	FLOW	25.0	HABD	23.0	OBST	23.0	PATHO	23.0	PRED	23.0
1,2,3	Aug-Oct	CSTAB	50.0	FLOW	50.0	HABD	25.0	PATHO	25.0	PRED	25.0	SEDLD	25.0
3	Oct-Mar	CSTAB	50.0	FLOW	50.0	COMP	25.0	HABD	25.0	PATHO	25.0	RIPCN	25.0
3,4	Mar-May	CSTAB	50.0	FLOW	50.0	HABD	50.0	COMP	25.0	PATHO	25.0	RIPCN	25.0
5	May-Oct	HABD	48.8	COMP	24.4	FLOW	24.4	PATHO	24.4	RIPCN	24.4	WITH	24.4
6	Oct-Mar	COMP	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0	SEDLD	25.0	WITH	25.0
7	Mar-Jun	WITH	16.4										

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2 High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6 overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Summit Cr - Crazyman Cr (RM 43.6 -49.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	38.1	Habitat productivity loss score:	#######

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	35	34	1	0	8.7	-6.8	-61.7
1,2,3	Aug-Ott	50	50	0	0	2.9	-46.7	-133.6
3	Ott-Mar	100	100	0	0	1.2	-66.7	-237.5
34	Mar-May	31	31	0	0	1.5	-78.4	-116.5
5	May-Ott	73	72	1	0	8.7	-8.7	-41.0
6	Ott-Mar	19	19	0	0	18.3	-33.9	-36.4
7	Mar-Jun	1	1	0	0	29.7	-4.0	0.8

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Art 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	24.1	oBST	24.1	PATHO	24.1	PRED	24.1	TEM	24.1	CSTAB	16.7
1,2,3	Aug-Ott	CSTAB	50.0	FLOW	50.0	SEDLD	25.0	PATHO	16.7	TEMP	,16.7	HABD	16.7
3	Oct-Mar	CSTAB	50.0	FLOW	50.0	SEDLD	25.0	COMP	12.5	HABD	12.5	PATHO	12.5
3,4	Mar-May	HABD	50.0	COMP	25.0	CSTAB	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0
5	May-Ott	HABD	48.9	COMP	24.4	FLOW	24.4	PATHO	24.4	RIPCN	24.4	WITH	24.4
6	Ott-Mar	COMP	25.0	FLOW	25.0	PATHO	25.0	RIPCN	25.0	SEDLD	25.0	WITH	25.0
7	Mar-Jun	WITH	25.0										

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM. chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Crazyman Cr - Gumboot Cr (RM 49.4 -52.7 from Snake R)

Restoration benefit category:	F	Chinook usage score:	11.5	Habitat productivity loss score:	-10.2

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	20	19	1	0	9.4	-4.5	0.0
1,2,3	Aug-Ott	30	30	0	0	7.7	-51.0	-1.1
3	Ott-Mar	60	60	0	0	8.3	-58.9	-60
34	Mar-May	6	6	0	0	9.8	-38.1	-31
5	May-Ott	2	1	1	0	7.5	0.0	-0.1
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	An 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	17,7	OBST	17.7	PATHO	17.7	SEDLD	17.7				
,1,2,3	Aug-Ott	HABD	25,0	PRED	,25.0	SEDLD	25,0	OBST	12.5	PATHO	12.5		
3	Oct-Mar	COMP	25.0	PATHO	25.0								
3,4	Mar-May	COMP	25,0	PATHO	25.0								
5	May-Ott	FLOW	'4.8	PATHO	4.8								
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Gumboot Cr - Dry Cr (RM 52.7 -55.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	3.8	Habitat productivity loss score:	-4,5

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	2	1	1	0	11.3	-4.3	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	4	0	4	0	9.4	-17.3	0.0
5	May-Oct	21	1	20	0	9.5	-2.5	-4.4
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att12	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	HABD	17.2	SEDLD	17.2								
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Oct	FLOW	24.0	PATHO	24.0								
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: *1-* prespawner; **2-** spawner; **3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling** presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no lie history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: **Dry Cr - Skookum Cr** (RM 55.4 -61.9 from Snake R)

Restoration benefit category: F	**Chinook usage score:** 2.7	**Habitat productivity loss score:** -4.3

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	2	1	1	0	10.5	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	5	4	1	0	8.4	-171	0.1
5	May-Ott	20	20	0	0	8.9	-1.4	-4.4
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	HABD	192	SEDLD	19.2								
1,2,3	Aug-Ott	NA		NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mai	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA
3,4	Mar-May	FLOW	25.0	PATHO	25.0								
5	May-Ott	FLOW	25.0	PATHO	25.0								
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: **CHEM - chemicals**
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity

NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)

RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Blue Hole - forks (RM 66.4 -71.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	5.9	Habitat productivity loss score:	7.6

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	7	1	6	0	7.7	-6.5	1.6
1,2,3	Aug-Oct	10	0	10	0	6.2	-6.1	6.7
3	Oct-Mar	20	0	20	0	6.2	0.0	0.0
3,4	Mar-May	3	1	2	0	6.6	0.0	-0.7
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Oct												
3	Oct-Mar	PATHO	25.0										
3,4	Mar-May	PATHO	25.0										
5	May-Oct	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this
Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7-yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: Skookum Cr - Blue Hole (RM 61.9 -66.4 from Snake R)

Restoration benefit category:	F	Chinook usage score:	0.4	Habitat productivity loss score:	0.0

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	2	1	1	0	10.5	0.0	0.0
1,2,3	Aug-Oct	NA	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	2	1	1	0	8.6	-42.9	0.0
5	May-Ott	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	An 5	% change	Att 6	% change
1	Apr-Aug	HABD	12.0	SEDLD	12.0								
1,2,3	Aug-Oct	NA	A	NA	NA	NA	N A	NA	NA	NA	NA	NA	NA
3	Ott-Mar	NA	NA	N A	NA	NA	NA	NA	NA	NA	NA	NA	NA
34	Mar-May	PATHO	12.5										
5	May-Ott	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	N A	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using there ch in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages.' 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawala

"NA" indicates that no tife history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Imnaha R.
Reach: South Fork Imnaha R (RM 71.4 -76.1 from Snake R)

Restoration benefit category:	F	[Chinook usage score:	3.8	Habitat productivity loss score:	7.7

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	6	6	0	0	5.0	-5.6	1.5
1,2,3	Aug-Oct	10	10	0	0	4.6	0.0	6.7
3	Oct-Mar	20	20	0	0	4.6	0.0	0.0
3,4	Mar-May	2	2	0	0	5.0	0.0	-0.5
5	May-Oct	NA	NA	NA	NA	NA	NA	NA
6	Oct-Mar	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug												
1,2,3	Aug-Ott												
3	Oct-Mar	'PATHO	12.5										
3,4	Mar-May	PATHO	12.5										
5	May-Ott	NA	NA	NA	NA	NA	"NA"	NA	NA	NA	NA	NA	NA
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:
- Level 1: Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6 overwintering; 7- yearling presmolt/smolt

Attributes: CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Lightning Cr.
Reach: Mouth - forks (RM 5.4- 13.9 from Snake R)

Restoration benefit category	F	Chinook usage score:	9.0	Habitat productivity loss score:	11.9

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	9	9	0	0	0.6	0.0	0.1
1 2 3	Aug-Oct	10	10		0	0.4	0.0	
3	Ott-Mar	20	20		0	0.5	4.9	
3 4	Mar-May	8	8	0	0	0.6	9.1	4.7
5	May-Ott	25	25	0	0	0.5	0.0	0.0
6	Ott-Mar	NA	N A	N A"	NA	" NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	23.1										
1,2,3	Aug-Ott	FLOW	8.3										
3 '	Ott-Mar	PATHO	"12.5										
3,4	Mar-May	COMP	,,25.0	PATHO	25.0								
5	May-Ott	COMP	25.0	PATHO	25.0								
6	Ott-Mar	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
7	Mar-Jun	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:

CHEM -	chemicals	NUTLD -	nutrient load	RIPCN -	riparian condition
cSTAB -	channel stability	OBST -	obstructions	SEDLD -	sediment load
cOMP -	competition (with other species)	OXYG -	dissolved oxygen	TEMP -	water temperature
FLOW -	flow	PATHO -	pathogens	WITH -	water withdrawals
HABD -	habitat diversity	PRED -	predators (includes fishing-related losses)		

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: **Mouth - Bear Gulch** (RM 25.4 -28.5 from Snake R)

Restoration benefit category:	D	Chinook usage score:	15.3	Habitat productivity loss score:	-620.2

Life stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	37	31	6	0	0.6	-66,1	-131.1
1,2,3	Aug-Oct	30	30	0	0	2,3	-20.3"'	-194.0
3	Oct-Mar	60	60	0	0	3.1	0.0	-72.5
3,4	Mar-May	24	24	0	0	3.8	0.0	-104.6
5	May-Oct	56	52	4	0	3.5	-3.4	-107.1
6	Oct-Mar	19	19	0	0"'"	3 . 1	0.0	-11.8
7	Mar-Jun	6	4	2	0	13.2	0.0	0.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template): Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	60.2	HABD	40.2	SEDLD	40.2	WITH	40.2	OBST	20.1	PRED	17.7
1,2,3	Aug-Ott	FLOW	53.1	CSTAB	35.4	HABD	35,4	WITH	35,4	OBST	17.7	PRED	17.7
3	Ott-Mar	CSTAB	4 4 . 2	FLOW	35.4	SEDLD	26,5	TEMP	17.7	PATHO	8.8 "	RIPCN	8.8 ""
3,4	Mar-May	CSTAB	.47,3.	FLOW	42.1	SEDLD	28.4	RIPCN	28.1	HABD	14.0	NUTLD	14.0
5	May-Ott	CSTAB	43.5	FLOW	42.0	HABD	29.0	RIPCN	29.0	SEDLD	29.0	PATHO	14.5
6	Ott-Mar	CSTAB	9.3	FLOW	6.2	HABD	6.2	RIPCN	6.2	SEDLD	6.2	PATHO	3.1
7 "	Mar-Jun	"											

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table
- Level 1: Low to average (relative to other reaches) abundance
- Level 2: High (relative to other reaches) abundance
- Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
- CHEM - chemicals
- CSTAB - channel stability
- COMP - competition (with other species)
- FLOW - flow
- HABD - habitat diversity
- NUTLD - nutrient load
- OBST - obstructions
- OXYG - dissolved oxygen
- PATHO - pathogens
- PRED - predators (includes fishing-related losses)
- RIPCN - riparian condition
- SEDLD - sediment load
- TEMP - water temperature
- WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: **Bear Gulch - Devil's Gulch (RM 28.5 -30.9 from Snake R)**

Restoration benefit category:	D	Chinook usage score:	28.6	Habitat productivity loss score:	-1122.8

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	34	28	6	0	0.5	-75.8	-151.8
1,2 3	Aug-Ott	30	30	0	o '	1.1	-31.2	-274.0
3	Ott-Mar	60	60	0	0	1.9	0.5	-102.4
34	Mar-May	32	23	9	0	3.3	-6.7	-179.4
5	May-Ott	121	51	70	0	2.4	-5.6	-278.2
6 "	Oct-Mar	3 8	19	19	" o "	1.9	0 . 4	-137.9
7	Mar-Jun	5	3	2	0	10.5	-3.8	0.9

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	65.8	HABD	43.9	SEDLD	43.9	WITH	43.9	CSTAB	25.0	TEMP	25.0
1,2,3	Aug-Ott	FLOW	75.0	CSTAB	50.0	HABD	50,0	SEDLD	50.0	WITH	50.0,,	OBST	25.0
3	Oct-Mar	CSTAB	75.0	FLOW	50.0	SEDLD	50.0	PATHO	25.0	RIPCN	25.0	TEMP	25.0
3,4	Mar-May	CSTAB	75.0	FLOW	50.0	SEDLD	50.0	RIPCN	33.3	PATHO	25.0	TEMP	25.0
5 '	May-Ott	CSTAB	50.7	FLOW	50.7	RIPCN	33,0	SEDLD	33.8	HABD	16.9	NUTLD	16.9
6	Ott-Mar	CSTAB	54.1	FLOW	36.1	HABD	36.1	RIPCN	36.1	SEDLD	36.1	PATHO	18.0
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1 - prespawner; 2- spawner 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes: **CHEM - chemicals**
CSTAB - **channel stability**
COMP - competition (with other species)
FLOW - ftOW
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.

Reach: Devil's Gulch - Lightning Cr (RM 30.9 -33.1 from Snake R)

Restoration benefit category:	D	Chinook usage score:	25.8	Habitat productivity loss score:	-1134.7]

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	36	30	6	0	0.5	-79.5	-181.9
1,2,3	Aug-Oct	40	40	0	0	1.4	-27.0	-386.9
3	Oct-Mar	80	80	0	0	2.1	5.6	-136.5
3,4	Mar-May	26	23	3	0	3.6	16.5	-162.5
5	May-Oct	52	50	2	0	2.8	-5.6	-171.9
6	Oct-Mar	19	19	0	0	2.1	5.9	-95.5
7	Mar-Jun	3	2	1	0	11.9	15.4	0.5

Lifs stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Atf 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Atf 5	% change	Atf 6	% change
1	Apr-Aug	FLOW	75.0	HABD	50.0	WITH	50.0	PRED	45.4	SEDLD	45.4	OBST	25.0
1,2,3	Aug-Ott	FLOW	75.0	CSTAB	50.0	HABD	50.0	WITH	50,0	PRED	37.5	OBST	25.0
3	Ott-Mar	CSTAB	62.5	Fiow	50.0	SEDLD	37.5	TEMP	25.0	PATHO"	12.5	RIPCN	12.5
3,4	Mar-May	CSTAB	75.0	FLOW		RIPCN	50'0	SEDLD	50.0	HABD	25.0	NUTLD	25.0
5	May-Ott	CSTAB	"75.0	FLOW		RIPCN	50,0	SEDLD	"50.0"'	HABD	22.0	NUTLD	25
6	Ott-Mar	CSTAB	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	SEDLD	50.0	PATHO	25
7 "	Mar-Jun	"		"									

Abundance *level* refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using there_ch in this table:

Level 1: Low to average **(relative to other reaches) abundance**
Level 2: High (relative to other reaches) abundance
Level 3 Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearlingpresmolt/smolt

Attributes.' CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Lightning Cr - Hayden Cr (RM 33.1 -38.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	43.8	Habitat productivity loss score:	-1569.3

Life stage	Months	No. vacant life history pathways by abundance level				Key habitat change		Habitat productivity loss score
		Total no.	1	2	3	Patient quantity	% change	
1	Apr-Aug	42	36	6	0	0.5	-83.5	-245.2
1,2,3	Aug-Oct	60	60	0	0	1.4	-27.0	-580.4
3	Oct-Mar	120	120	0	0	2.1	5.6	-204.8
3,4	Mar-May	33	30	3	0	3.6	16.0	-210.2
5	May-Oct	73	71	2	0	2.8	-4.1	-246.4
6	Oct-Mar	19	19	0	0	2.1	5.9	-82.8
7	Mar-Jun	2	1	1	0	11.9	20.0	0.5

Life stage	Months	Highest productivity impact attributes (% change in impact from template)											
		Att 1	% change	Att 2	% change	Att 3	% change	Att 4	% change	Att 5	% change	Att 6	% change
1	Apr-Aug	FLOW	75.0	HABD	50.0	SEDLD	50.0	WITH	50.0	CSTAB	25.0	OBST	25.0
1,2,3	Aug-Oct	FLOW	75.0	CSTAB	50.0	HABD	50.0	SEDLD	50.0	WITH	50.0	OBST	25.0
3	Ott-Mar	CSTAB	75.0	FLOW	50.0	SEDLD	50.0	PATHO	25.0	RIPCN	25,0	TEMP	25.0
34	Mar-May	CSTAB	75.0	FLOW	75.0	RIPCN	50.0	SEDLD	50.0	HABD	25.0	NUTLD	25.0
5	May-Ott	CSTAB	74.4	FLOW	74.4	RIPCN	49.6	SEDLD	49.6	HABD	24.8	NUTLD	24.
6	Ott-Mar	CSTAB	75.0	FLOW	50.0	HABD	50.0	RIPCN	50.0	SEDLD	50.0	PATHO	25.
7	Mar-Jun												

Abundance level **refers to estimated relative abundance of spawners that spawned** in the natal stream **reaches that populated** the life history pathways using the reach in this table:

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- **prespawner;** 2- **spawner;** 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling**presmolt/smolt**

Attributes: **CHEM - chemicals**
CSTAB - channel stability
COMP - competition (with other species)
FLOW - **flow**
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes **fishing-related** losses)
RIPCN - riparian condition
SEDLD - sediment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways **was** present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template.

Stream Reach Summary for Vacant Spring Chinook Salmon Life Histories

Stream: Little Sheep Cr.
Reach: Hayden Cr - McCully Cr (RM 38.8 -48.8 from Snake R)

Restoration benefit category:	B	Chinook usage score:	51.9	Habitat productivity loss score:	-1517.4

Liie stage	Months	No. vacant life history pathways by abundance level: Total no.	1	2	3	Key habitat change: Patient quantity	% change	Habitat productivity loss score
1	Apr-Aug	42	0	42	0	0.4	-85.8	-245.2
1,2,3	Aug-Oct	60	0	60	0	1.2	-270	-5479
3	Ott-Mar	120	0	120	0	17	-1.8	-204.8
3,4	Mar-May	33	0	33	0	2.0	-0.5	-210.2
5	May-Ott	71	0	71	0	2.2	-8.7	-241.5
6	Ott-Mar	19	0	19	0	1.7	-1.9	-68.0
7	Mar-Jun	1	0	1	0	6.7	0.0	0.2

Life stage	Months	Highest productivity impact attributes (% change in impact from template): At! 1	% change	At! 2	% change	At! 3	% change	At! 4	% change	At! 5	% change	At! 6	% change
1	Apr-Aug	FLOW	75.0	HABD	50.0	SEDLD	50.0	WITH	50.0	OBST	250	PRED	25.0
1,2,3	Aug-Ott	FLOW	75.0	CSTAB	50.0	HABD	50.0	WITH	50.0	OBST	25.0	PRED	25.0
3	Ott-Mar	"CSTAB"	62.5	FLOW	500	SEDLD	37.5	TEMP	25.0	PATHO	12.5	RIPCN	12.5
3,4	Mar-May	CSTAB	75.0	FLOW	75.0	RIPCN	50.0	SEDLD	50.0	HABD	25.0	NUTLD	250
5	May-Ott	CSTAB	75.0	FLOW	75.0	"HAED"	50.0	RIPCN	50.0	SEDLD	50.0	NUTLD	250
6	Ott-Mar	CSTAB	75.0	FLOW	50.0	HABD	500	RIPCN	50.0	SEDLD	50.0	PATHO	250
7	Mar-Jun												

Abundance level refers to estimated relative abundance of spawners that spawned in the natal stream reaches that populated the life history pathways using the reach in this table

Level 1: Low to average (relative to other reaches) abundance
Level 2: High (relative to other reaches) abundance
Level 3: Exceptionally high (relative to other reaches) abundance

Life stages: 1- prespawner; 2- spawner; 3- incubation; 4- fry colonization; 5- summer rearing; 6- overwintering; 7- yearling presmolt/smolt

Attributes:
CHEM - chemicals
CSTAB - channel stability
COMP - competition (with other species)
FLOW - flow
HABD - habitat diversity
NUTLD - nutrient load
OBST - obstructions
OXYG - dissolved oxygen
PATHO - pathogens
PRED - predators (includes fishing-related losses)
RIPCN - riparian condition
SEDLD - aadiment load
TEMP - water temperature
WITH - water withdrawals

"NA" indicates that no life history pathway meeting the criteria used in defining these pathways was present.
Blank cells under attributes indicate no additional attributes with negative effects on productivity were evident compared to those present in the template,

APPENDIX H

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