

**Bonneville Power Administration  
Fish and Wildlife Program FY99 Proposal Form**

**Section 1. General administrative information**

**FEASIBILITY OF SOCKEYE SALMON  
REINTRODUCTION TO WALLOWA AND  
WARM LAKES**

**Bonneville project number, if an ongoing project** 9152

**Business name of agency, institution or organization requesting funding**  
Nez Perce Tribe Department of Fisheries Resources Management

**Business acronym (if appropriate)** NPT

**Proposal contact person or principal investigator:**

Name	<u>Billy D. Arnsberg</u>
Mailing Address	<u>3404 Hwy. 12</u>
City, ST Zip	<u>Orofino, ID 83544</u>
Phone	<u>208-476-7296</u>
Fax	<u>208-476-0719</u>
Email address	<u>billa@nezperce.org</u>

**Subcontractors.**

<b>Organization</b>	<b>Mailing Address</b>	<b>City, ST Zip</b>	<b>Contact Name</b>

**NPPC Program Measure Number(s) which this project addresses.**  
7.5A.3

**NMFS Biological Opinion Number(s) which this project addresses.**  
Endangered Species Act, Section 7 and Section 10

**Other planning document references.**

*Wy Kan Ush Me Wa Kush*, P. 117, calls for the initiation of a program to reestablish sockeye to Wallowa Lake. The Snake River Salmon Recovery Team Recommendations

to the National Marine Fisheries Service that states that "Warm or Wallowa Lakes should prove to be substantial contributors to recovery" (SRSRT 1994).

**Subbasin.**

Warm Lake, ID - Salmon River Basin, Wallowa Lake OR - Grande Ronde River Basin

**Short description.**

Determine the feasibility of reintroducing Snake River sockeye salmon into Warm Lake, Idaho and Wallowa Lake, Oregon.

**Section 2. Key words**

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction		Watershed
	Resident fish		O & M	*	Biodiversity/genetics
	Wildlife		Production	*	Population dynamics
	Oceans/estuaries	X	Research		Ecosystems
	Climate		Monitoring/eval.		Flow/survival
	Other		Resource mgmt		Fish disease
			Planning/admin.	X	Supplementation
			Enforcement		Wildlife habitat en-
			Acquisitions		hancement/restoration

**Other keywords.**

**Section 3. Relationships to other Bonneville projects**

Project #	Project title/description	Nature of relationship

**Section 4. Objectives, tasks and schedules**

**Objectives and tasks**

Obj 1,2,3	Objective	Task a,b,c	Task
1	Review the historical data to determine the physical, chemical, and biological characteristics of Wallowa and	A	Review the historical records at area universities and fishery libraries.

	Warm Lakes that were important to the indigenous sockeye salmon and identify appropriate donor stocks for reintroduction.		
2	Identify the historical changes in the physical, chemical, and biological characteristics of Wallowa and Warm Lakes, their primary spawning tributaries, and the anadromous migration route to them that may constrain reintroduction success.	A	Conduct field studies to determine the physical habitat changes that may impede adult migration to Wallowa and Warm Lakes and to the spawning habitat.
		B	Document man-made or natural barriers for emigration and immigration and determine possible habitat modifications to improve migration.
3	Develop simulation models for Warm Lake and Wallowa Lake to measure the contribution of natural production that would result from various supplementation strategies, habitat modifications, and harvest management strategies.	A	Determine primary and secondary productivity of Wallowa and Warm Lakes by taking water, benthic invertebrate, and zooplankton samples.
		B	Review the historic fish sampling data on Wallowa and Warm Lakes and determine possible ecological interactions or competition between species that may prevent successful reintroduction of sockeye salmon.
		C	Model sockeye salmon natural production expected from Wallowa and Warm Lakes that incorporates the lake's current productivity status, spawning habitat availability and quality, and potential competition between species.
4	Recommend an action plan for achieving the Grand Ronde River and Salmon River	A	Develop an action plan that specifies appropriate donor stocks and stocking strategies that will

	subbasin goals for sockeye recovery and restoration.		lead to sockeye salmon reintroduction success in Wallowa and Warm Lakes.

**Objective schedules and costs**

Objective #	Start Date mm/yyyy	End Date mm/yyyy	Cost %
1	01/1999	12/1999	10
2	01/1999	12/2000	20
3	03/1999	11/2000	60
4	09/2000	12/2000	10

**Schedule constraints.**

The availability of Snake River sockeye salmon eggs and/or fry will not be limited to the Stanley Basin lakes in the future. The genetic structure of Redfish Lake sockeye salmon will not restrain reintroduction success to Wallowa and Warm Lakes. The migration corridor will be sufficient to pass sockeye salmon adults and juveniles to and from the ocean.

**Completion date.**

2000

**Section 5. Budget**

**FY99 budget by line item**

Item	Note	FY99
Personnel		103,000
Fringe benefits		24,700
Supplies, materials, non-expendable property		10,000
Operations & maintenance		7,500
Capital acquisitions or improvements (e.g. land, buildings, major equip.)		32,500
PIT tags	# of tags:	
Travel		16,000
Indirect costs		56,600
Subcontracts		10,000
Other		
<b>TOTAL</b>		<b>260,300</b>

### ***Outyear costs***

<b>Outyear costs</b>	<b>FY2000</b>	<b>FY01</b>	<b>FY02</b>	<b>FY03</b>
Total budget	205,000			
O&M as % of total	94			

## **Section 6. Abstract**

The Snake River sockeye salmon were listed as an endangered species on November 20, 1991 under the Endangered Species Act (ESA). This study would determine current habitat conditions and if and how production of indigenous Snake River sockeye salmon could be restored to Wallowa Lake in Northeast Oregon and Warm Lake in central Idaho. This study is consistent with the Snake River Salmon Recovery Team Recommendations to the National Marine Fisheries Service that states that "Warm or Wallowa Lakes should prove to be substantial contributors to recovery" (SRSRT 1994).

During the first year of study, we will review all historical and current data to determine the physical, chemical, and biological changes that have occurred in Wallowa and Warm Lakes. Field reconnaissance to determine the physical habitat barriers to the lakes and to the spawning areas will be conducted. We will determine the current productive state of Wallowa and Warm Lakes by reviewing recent data and taking additional samples if needed. Fish sampling data will be reviewed with additional sampling conducted to measure possible interactions with other species. A model will be constructed that incorporates Wallowa and Warm Lake's sockeye salmon production potential. An action plan and recommendations will be made that determines the feasibility of reintroducing sockeye salmon to Wallowa and Warm Lakes. Based on a positive analysis for sockeye salmon reintroduction success, future work will include the acquisition of sockeye broodstock, eggs and/or fry for reintroduction to Wallowa and Warm Lakes and monitoring and evaluation of the program.

## **Section 7. Project description**

### **a. Technical and/or scientific background.**

The Snake River sockeye salmon were listed as an endangered species on November 20, 1991 under the Endangered Species Act (ESA). The present existence of Snake River sockeye salmon has been reduced to a remnant population in Redfish Lake in the Stanley Basin, Idaho. This study would determine current habitat conditions and if and how production of indigenous Snake River sockeye salmon could be restored to Wallowa Lake in Northeast Oregon and Warm Lake in central Idaho. Subbasin and system planners have recommended that kokanee salmon that exhibit anadromous tendencies or other donor stock be used as broodstock for reintroductions into Warm Lake. This approach was also recommended in the first phase of a detailed feasibility analysis for reintroducing sockeye salmon to Wallowa Lake (Cramer et al. 1990). This study is consistent with the Snake River Salmon Recovery Team Recommendations to the

National Marine Fisheries Service that states that "Warm or Wallowa Lakes should prove to be substantial contributors to recovery" (SRSRT 1994).

**b. Proposal objectives.**

Objective 1. Review the historical data to determine the physical, chemical, and biological characteristics of Wallowa and Warm Lakes that were important to the indigenous sockeye salmon and identify appropriate donor stocks for reintroduction.

Objective 2. Identify the historical changes in the physical, chemical, and biological characteristics of Wallowa and Warm Lakes, their primary spawning tributaries, and the anadromous migration route to them that may constrain reintroduction success.

Objective 3. Develop simulation models for Warm Lake and Wallowa Lake to measure the contribution of natural production that would result from various supplementation strategies, habitat modifications, and harvest management strategies.

Objective 4. Recommend an action plan for achieving the Grand Ronde River and Salmon River subbasin goals for sockeye recovery and restoration.

H<sub>01</sub>: Primary and secondary productivity of Wallowa and Warm Lakes will not support sockeye salmon.

H<sub>02</sub>: Spawning habitat quantity and quality in Wallowa and Warm Lakes and their tributaries will not support sockeye salmon.

Assumptions: The general public will be supportive of sockeye reintroductions in Wallowa and Warm Lakes and any conflict of interests (e.g. irrigation dams, water rights, fishery concerns, etc.) can be resolved. Adult sockeye salmon migrating to and from the ocean will survive at an adequate rate to allow a high probability of reintroduction success. The genetic structure of Redfish Lake sockeye salmon will not restrain reintroduction success to Wallowa and Warm Lakes.

**c. Rationale and significance to Regional Programs.**

The Snake River sockeye salmon were listed as an endangered species on November 20, 1991 under the Endangered Species Act (ESA). The present existence of Snake River sockeye salmon has been reduced to a remnant population in Redfish Lake in the Stanley Basin, Idaho. This study would determine current habitat conditions and if and how production of indigenous Snake River sockeye salmon could be restored to Wallowa Lake in Northeast Oregon and Warm Lake in central Idaho. Subbasin and system planners have recommended that kokanee salmon that exhibit anadromous tendencies or other donor stock be used as broodstock for reintroductions into Warm Lake. This approach was also recommended in the first phase of a detailed feasibility analysis for reintroducing sockeye salmon to Wallowa Lake (Cramer et al. 1990). This study is consistent with the Snake River Salmon Recovery Team Recommendations to the

National Marine Fisheries Service that states that "Warm or Wallowa Lakes should prove to be substantial contributors to recovery" (SRSRT 1994).

The Snake River sockeye captive broodstock program has produced a substantial number of eggs and juveniles that are available for future supplementation in the Stanley Basin, Idaho. The sockeye salmon captive broodstock program has produced a surplus of juveniles above what the Stanley Basin lakes can support. Several state and federal agencies and Tribes have indicated that sockeye salmon should be restored in lakes where historical production was high and where they are now extinct.

This project will provide fishery managers the necessary habitat data and current limiting factors to determine the feasibility of reintroducing sockeye salmon into Wallowa Lake in Northeast Oregon and Warm Lake in central Idaho. Recommendations will be made for possible habitat improvements in Wallowa and Warm Lakes that may help in forecasting costs and to predict the probability of successful sockeye reintroductions. This project may also reduce the probability of extinction of the Snake River sockeye salmon by spreading the population out between two other primary production areas.

**d. Project history**

New Project. This project was first submitted by the Nez Perce Tribe for FY 1997 funding.

**e. Methods.**

M<sub>1</sub>: 1) Review the historical records at area universities and fishery libraries to determine the physical, chemical, and biological characteristics of Wallowa and Warm Lakes.

M<sub>2</sub>: 1) Conduct field studies to determine the physical habitat changes that may impede adult migration to Wallowa and Warm Lakes and to the spawning habitat. Document man-made or natural barriers for emigration and immigration and determine possible habitat modifications to improve migration.

M<sub>3</sub>: 1) Determine primary and secondary productivity of Wallowa and Warm Lakes by taking water, benthic invertebrate, and zooplankton samples. Sampling will be conducted seasonally to describe a yearly profile of the Lake's current productive state.

M<sub>4</sub>: 1) Review the historic fish sampling data on Wallowa and Warm Lakes and determine possible ecological interactions or competition between species that may prevent successful reintroduction of sockeye salmon. Additional data, if needed, on current fishes present in the lakes will be obtained through traditional fish sampling gear such as gill netting and electrofishing.

M<sub>5</sub>: 1) Model sockeye salmon natural production expected from Wallowa and Warm Lakes that incorporates the lake's current productivity status, spawning habitat availability

and quality, and potential competition between species.

M<sub>6</sub>: 1) Develop an action plan that specifies appropriate donor stocks and stocking strategies that will lead to sockeye salmon reintroduction success in Wallowa and Warm Lakes.

Expected Outcome: A documentation of the physical, chemical, and biological conditions and notable historical changes that have occurred in Wallowa and Warm Lakes. A detailed description of physical habitat barriers to the lakes and to the spawning areas. A description of the current fishes present in Wallowa and Warm Lakes and possible interactions or competition of resources with sockeye salmon. A sockeye salmon production model will be available to fishery managers for Wallowa and Warm Lakes along with an action plan for sockeye salmon reintroduction and habitat improvement recommendations.

**f. Facilities and equipment.**

Two boats suitable for limnological sampling will be purchased. Two GSA vehicles suitable for towing the boats will be leased. All necessary limnological sampling equipment and field camp equipment will be purchased. Office space will be made available in either the Lapwai, ID, McCall, ID, or Enterprise, OR Tribal office facilities.

**g. References.**

Cramer, S.P. 1990. Feasibility of re-introducing sockeye and coho salmon in the Grande Ronde River and coho and chum salmon in the Walla Walla River. S.P. Cramer and Associates; prepared for the Nez Perce Tribe, Umatilla Confederated Tribes, Warm Springs Confederated Tribes, and ODFW, Portland, OR. [S/X.A.10]

SRSRT (Snake River Salmon Recovery Team). 1994. Final Recommendations to the National Marine Fisheries Service. [S/X.E.1]

## **Section 8. Relationships to other projects**

Project 9107100 is assessing Snake River sockeye salmon habitat in the Stanley Basin and this project would be assessing current habitat conditions for sockeye salmon in Warm Lake, Idaho and Wallowa Lake, Oregon. Project 9107200 is currently trapping and rearing sockeye broodstock from the Stanley Basin as part of the Snake River sockeye recovery program and this project would coordinate with appropriate agencies on broodstock selection and acquisition. Project 9204000 is currently conducting sockeye salmon broodstock research and this project would provide an opportunity to develop other areas of opportunity to increase sockeye salmon production through artificial propagation.

Cooperation and coordination will be needed with the National Marine Fisheries Service,

Idaho Department of Fish and Game, Shoshone-Bannock Tribes, and Oregon Department of Fish and Wildlife in developing a management plan for the reintroduction of sockeye salmon into Wallowa and Warm Lakes.

## **Section 9. Key personnel**

Billy D. Arnsberg is currently responsible for: assessing summer and fall chinook salmon spawning, incubation, outmigration timing, and survival in the Clearwater and upper tributaries, lower Salmon, Grande Ronde, and Imnaha rivers. The Project Leader coordinates summer and fall chinook salmon research with the Bonneville Power Administration, U.S. Fish and Wildlife Service, National Marine Fisheries Service, U.S. Forest Service, Washington Department of Fisheries, Oregon Department of Fish and Wildlife, Idaho Department of Fish and Game and other agencies as required. The Project Leader works closely with the Nez Perce Tribal Hatchery Monitoring and Evaluation studies and oversee Project 9801004 Monitoring and Evaluation of Lyons Ferry Hatchery Fall Chinook released upstream of Lower Granite Dam. The Project Leader is responsible for administrating Bonneville Power Administration contracts and conducting evaluation studies for the Nez Perce Tribe including development of budgets, plan of operation, monitoring expenditures, statements of work, reporting and coordinating office and field work with management staff. The Project Leader is also responsible for maintaining written records of interactions with funding agencies, reviewing agencies and co-management agencies, write and publish meeting, progress and annual reports, maintain a data base, correspond orally and in writing with supervisory staff and co-management agencies. The Project Leader provides management, training and supervision of full time and temporary personnel for conducting an evaluation of summer and/or fall chinook salmon restoration potential in mainstem rivers, and yearling fall chinook monitoring and evaluation studies. The Project Leader acts as a technical representative of the Nez Perce Tribe on multi-agency committees for coordination and planning of chinook salmon assessment and restoration in mainstem rivers, including hatchery management, supplementation and natural production.

### **RESUME:**

Project Leader: Billy D. Arnsberg

### **EDUCATION:**

UNIVERSITY OF IDAHO, MOSCOW, ID. 1987-1990. M.S. coursework in Fisheries Science. Thesis entitled: Food Availability and Diet of Fish in Little Payette Lake Before and After Rotenone Treatment.

UNIVERSITY OF MISSOURI, COLUMBIA, MO. 1982-1984. B.S. Degree in Fisheries and Wildlife Management.

SOUTHEAST MISSOURI STATE UNIVERSITY, CAPE GIRARDEAU, MO.

1980-1982.

**EXPERIENCE:**

NEZ PERCE TRIBE, LAPWAI, ID. 1989-Present. Fisheries Research Project Leader. Researcher and primary author of the Mainstem Clearwater River Study: Assessment for Salmonid Spawning, Incubation, and Rearing, BPA Project 88-15. Project Leader for two years on Salmon Supplementation Studies in Idaho Rivers, BPA Project 8909802. Currently Project Leader for Assessing Summer and Fall Chinook Salmon Restoration in the Snake River Basin (BPA Project 9403400).

IDAHO DEPARTMENT OF FISH AND GAME, McCALL, ID. 4/86-9/88. Fisheries Research Technician.

DWORSHAK NATIONAL FISH HATCHERY, AHTAHKALA, ID. 12/86-4/87. Fisheries Biological Aid.

McCALL FISH HATCHERY, McCALL, ID. 10/86-12/86. Fisheries Biological Aid.

MISSOURI DEPARTMENT OF CONSERVATION, COLUMBIA, MO. 1/85-12/85 and 9/85-12/85. Wildlife Research Technician.

U.S. FISH AND WILDLIFE SERVICE, SASKATCHEWAN, CANADA. 7/85-9/85. Wildlife Research Technician.

U.S. FISH AND WILDLIFE SERVICE, SASKATCHEWAN, CANADA. 4/85-7/85. Wildlife Research Technician.

MISSOURI DEPARTMENT OF NATURAL RESOURCES, COLUMBIA, MO. 5/84-10/84. State Park Ranger.

UNIVERSITY OF MISSOURI, COLUMBIA, MO. 5/82-5/84. Fisheries Research Technician.

**PUBLICATIONS:**

Muir, W.D., S.G. Smith, E.E. Hockersmith, M.B. Eppard, W.P. Connor, and B.D. Arnsberg. REVIEW DRAFT. 1998. Passage survival of hatchery subyearling fall chinook salmon to Lower Granite, Little Goose, and Lower Monumental Dams, 1996. Prepared for Bonneville Power Administration.

Arnsberg, B.D and D.P. Statler. 1995. Assessing summer and fall chinook salmon restoration in the upper Clearwater River and principal tributaries. Annual Report 1994 prepared for the U.S. Department of Energy, Bonneville Power Administration, Contract No. DE-BI79-87BI12872, Project No. 94-034.).

Arnsberg, B.D., W.P. Connor, and E. Connor. 1992. Mainstem Clearwater River study: assessment for salmonid spawning, incubation, and rearing. Project 88-15. Final Report to Bonneville Power Administration, Portland, OR.

Connor, W.P., B.D. Arnsberg, and E. Connor. 1990. Mainstem Clearwater River study: assessment for salmonid spawning, incubation, and rearing. Project 88-15. Annual Report to Bonneville Power Administration, Portland, OR.

Anderson, D., D. Scully, J.H. Griswold, and B. Arnsberg. 1987. Idaho Department of Fish and Game Federal Aid in Fish Restoration, Job Performance Report, Project F-71-R-11.

**RESUME:**

Research Director: Paul Kucera, Director of Biological Services, 160 hrs  
Nez Perce Tribe Department of Fisheries Resources Management

**EDUCATION:**

Bachelor of Science. 1975.  
Utah State University.  
Major: Fisheries Management.

Completed MS studies at the University of Idaho 1990  
Major: Fisheries Management.

**PROFESSIONAL EXPERIENCE:**

1991-present Director of Biological Services with the Nez Perce Tribe  
Department of Fisheries Resources Management.  
Responsible for technical program direction and  
administration of the Fisheries Research Division.

1988-1991 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries  
Department.

1987-1988 Acting Fisheries Program Manager with the Nez Perce Tribe  
Fisheries Department. Responsible for fisheries program  
management and direction.

- 1984-1986 Senior Fisheries Biologist with the Nez Perce Tribe Fisheries Department. Conducted research on juvenile steelhead trout life history characteristics and abundance in relation to physical habitat parameters on five streams.
- 1982-1983 Project fisheries biologist with the Nez Perce Tribe Fisheries Department. Responsible for conduct of a physical and biological inventory of streams on the reservation proper with emphasis on anadromous salmonids.
- 1978-1980 Fisheries biologist with the Colville Confederated Tribes Fish and Wildlife Department. Developed fishery management programs for the Colville Tribe on their 1.3 million acre reservation and the 1.7 million acre ceded area.
- 1975-1978 Fisheries research biologist with W.F. Sigler and Associates, Environmental Consulting Firm. Ecological and fish life history research on 110,000 acre Pyramid Lake, Nevada.

### **Unique Abilities:**

- Certified Fisheries Scientist - AFS
- Experienced with Endangered Species Act and management of listed fish species.
- Experience in program development and procuring project funding.
- Research and management experience with resident and anadromous species.
- Familiar with Tribal government and management approaches.
- Trained in CPR and First Aid.
- Certified SCUBA diver - NAUI

### **Publications**

Kucera, P.A. and J.L. Kennedy. 1977. Evaluation of a sphere volume method for estimating fish fecundity. *The Progressive Fish Culturist*. 39(3):115-117.

Kucera, P.A. 1978. Reproductive biology of the tui chub, *Gila bicolor*, in Pyramid Lake, Nevada. *Great Basin Naturalist*. 38(2): 203-207.

Kennedy, J.L. and P.A. Kucera. 1978. The reproductive ecology of the Tahoe sucker, *Catostomus tahoensis*, in Pyramid Lake, Nevada. *Great Basin Naturalist* 38(2): 181-186.

Vigg, S., P. A. Kucera. 1981. Contributions to the life history of Sacramento perch, Archoplites interruptus, in Pyramid Lake, Nevada. Great Basin Naturalist 41(3): 278-289.

Sigler, W.F., W.T. Helm, P. A. Kucera, S. Vigg and G. W. Workman. 1983. Life history of the Lahontan cutthroat trout, Salmo clarki henshawi, in Pyramid Lake, Nevada. Great Basin Naturalist 43(1): 1-29.

Kucera, P.A., D.L. Koch and G.F. Marco. 1985. Introductions of Lahontan cutthroat trout into Omak Lake, Washington. North Amer. Jrnl. Of Fish. Mngt. 5(2): 296-301.

Johnson, J.H. and P.A. Kucera. 1985. Summer-autumn habitat utilization of subyearling steelhead trout in tributaries of the Clearwater River, Idaho. Can. Jrnl. Zool. Vol, 63:2283-2290.

Kucera, P.A. 1989. Nez Perce Tribal review of the Imnaha River Lower Snake River Compensation Plan. AFF1/LSR-89-08, Tech. Rep. 89-7. Annual project report to the U.S. Fish and Wildlife Service. Nez Perce Tribe Fisheries Dept., Lapwai, ID. 49 pp.

Kucera, P.A. and M.L. Blenden. 1996. Summary report of 1996 project activities relating to endangered chinook salmon populations listed under the Endangered Species Act. Nez Perce Tribe Department of Fisheries Resources Management, Lapwai, Idaho. 60 pp.

**RESUME:**

Technical Advisor: Jay A. Hesse, Research Coordinator, no funding associated  
Nez Perce Tribe Department of Fisheries Resources Management

Education: M.S. in Fisheries, Michigan State University, 1994  
B.S. in Fisheries and Wildlife, Michigan State University, 1992

Duties: Technical direction and supervision of fisheries research projects, research coordination, Nez Perce Tribe LSRCP project implementation, report writing, monitoring and evaluation plan and proposal development, tribal fisheries research representation at federal and state meetings, budget preparation, personnel supervision.

Experience: Project Leader, Idaho Salmon Supplementation Study. Nez Perce Tribe. July 1994 - October 1997.

Publications: Hesse, J. 1997. A-run steelhead status in tributaries of the lower Clearwater River, Idaho. In Interactions of hatchery and wild steelhead in the Clearwater River of Idaho. 1995 Progress Report, Fisheries Stewardship Project, USFWS Report. November 1997.

Hesse, J.A., P.J. Cleary, and B.D. Arnsberg. 1995. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1994. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. and B.D. Arnsberg 1994. Salmon Supplementation Studies in Idaho Rivers. Annual Report - 1993. U.S. Department of Energy - Bonneville Power Administration. Portland, Oregon.

Hesse, J.A. 1994. Contribution of hatchery and natural chinook salmon to the eastern Lake Michigan fishery, 1992-1993. Masters Thesis, Michigan State University.

## **Section 10. Information/technology transfer**

An action plan that specifies appropriate donor stocks and stocking strategies that will lead to sockeye salmon reintroduction success in Wallowa and Warm Lakes will be developed and distributed.