

**Bonneville Power Administration  
Fish and Wildlife Program FY98 Watershed Proposal Form**

**Section 1. General administrative information**

**Title**    **Educate Landowners And Agencies On  
Salmon Stream Restoration Methods**

**Bonneville project number, if an ongoing project**    8055

**Business name of agency, institution or organization requesting funding**  
Oregon State University Extension Service

**Business acronym (if appropriate)**    OSU

<b>Proposal</b>	<b><u>contact person:</u></b>	<b><u>principal investigator:</u></b>
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**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.**  
10.2C.1, 10.8C.14, 2.2C.1, 3.3A.1, 6.1D.6, 7.0B.1, 7.0C.3, 7.2D.4, 7.5C.4, 7.5D.3,  
7.5E.3, 7.6A.2, 7.6B.1, 7.6B.3, 7.6B.4, 7.6B.5, 7.6B.6, 7.6C.5, 7.7A.4, 7.8A.2, 7.8A.8,  
7.81.2

**NMFS Biological Opinion Number(s) which this project addresses.**

Not applicable

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**Other planning document references.**

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 Oregon Dept. of Ag and Oregon Dept. of Fish and Wildlife have expressed a need for Extension involvement. The Tribal Salmon Corp in the local areas and the head office in Portland OR are very willing to supply the labor needed for planting and fencing

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**Subbasin.**

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**Short description.**

Educate stakeholders with workshops, demonstration and research, on riparian enhancement, reduction of soil erosion, improving water quality and quantity.

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**Section 2. Key words**

Mark	Programmatic Categories	Mark	Activities	Mark	Project Types
X	Anadromous fish		Construction	X	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.		Supplementation
			Enforcement	+	Wildlife habitat en-
			Acquisitions		enhancement/restorati
					on

**Other keywords.**

Education, demonstration, water quality

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

Project #	Project title/description	Nature of relationship

## Section 4. Objectives, tasks and schedules

### *Objectives and tasks*

<b>Obj 1,2,3</b>	<b>Objective</b>	<b>Task a,b,c</b>	<b>Task</b>
1	conduct educational programs to change management systems	a	create Watershed Stewardship Educational Program (WSEP)
1		b	test pilot WSEP 3 sites
1		c	revise WSEP and publish for state
1		d	conduct WSEP statewide
1		e	conduct individual plan workshops
1		f	conduct multiple tours, workshops on objectives 2 through 8
2	catergorize stream temp. by type	a	choose streams east side, 3 types
2		b	install monitors
2		c	collect data every 2 weeks
2		d	analyze data by stream types
3	show mgnt change affect on stream health; temp, vegetation	a	choose risk streams, install monitoring systems
3		b	yr 2 & 3, install mgmt changes
3		c	take data, analyze every 2 weeks
4	accertain tree protection and spacing feasibility	a	plant clusters and spaced trees with different protection devices
4		b	determine survival by planting design, tree species and by protection device
5	rank available tree species and clones, make available	a	plant available poplar clones, rank for suitability, produce or intice private nurseries to make available
6	stop high water flow off of and soil erosion from wheat fallow	a	continue demos of annual crop no-till in Columbia Basin
6		b	expand cost share for commercial no-till planting, Columbia Basin

### *Objective schedules and costs*

<b>Objective #</b>	<b>Start Date mm/yyyy</b>	<b>End Date mm/yyyy</b>	<b>Cost %</b>
1	04/1998	04/2002	0.4
2	04/1998	11/2000	<b>combined w 3</b>
3	04/1998	11/2003	72.8
4	04/1998	11/2003	<b>combined w 5</b>

5	04/1998	11/2003	5.5
6	04/1998	11/2001	21.3
			TOTAL 100%

**Schedule constraints.**

Floods may destroy some stream renovation efforts, very dry springs may delay acceptance of annual crop no-till planting

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**Completion date.**

2003

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**Section 5. Budget**

***FY99 budget by line item***

**Note - see Addendum II for complete budget starting in 1998**

Item	Note	98	99
Personnel			214,000
	200,000		
Fringe benefits			67,808
	64,000		
Supplies, materials, non-expendable property	printing , tree stock cost share		38,938
Operations & maintenance	cost share, structures, no-till		180,000
	180,000		
Capital acquisitions or improvements (e.g. land, buildings, major equip.)	computer and projection equip.	60,000	0
PIT tags	# of tags:		
Travel			105,000
	104,500		
Indirect costs	20.3% off campus Extension	168,363	141,427
Subcontracts			
Other	temp. labor, Salmon Corp, etc.	59,390	90,938
<b>TOTAL</b>			838,111
	997,743		

***Outyear costs***

Outyear costs	FY2000	FY01	FY02	FY03
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Total budget	744,387	698,582	486,734	505,862
O&M as % of total	15	15.4	0	0

## Section 6. Abstract

Type here (provide answers in paragraph form)

The Governor's Salmon Restoration Initiative, DEQ 303(D) list and Senate Bill 1010, the Coastal Zone Management Act, encourage or require improvements to watersheds to benefit fish and wildlife. None directly address the educational efforts needed to make these a success. Local watershed councils and SWCD board members have been approaching OSU Extension and asking for help. A number of SWCD members have attended Extension Leadership Training seminars. On October 7, 1997, 12 of the Oregon Department of Agriculture (ODA) new watershed managers attended an Extension Leadership training put on for them.

At the Oregon Cattlemen's meeting in Bend in November, 1997, Bruce Andrews of ODA and Jim Greer of Oregon Department of Fish and Wildlife(ODF&W) stated, in a meeting with OSU Extension Agents, that they needed Extension's help in bringing people to the table. They further stated that they did not have the trust of the landowners and managers and would have a very hard time making the planning process work without Extension's help.

The BLM, NRCS, USFS, have signed an agreement to use Proper Functioning Condition (PFC) to assess the quality of streams for fish and wildlife in the Western U.S. This grant teaches PFC assessment to Extension Agents and provides means for them to teach agencies, landowners and managers.

This grant provides the means for OSU Extension to greatly expand pilot watershed workshops, put very targeted demonstrations and missing research on the ground, coordinate and hold educational tours and meetings.

With this needed funding Extension will indeed bring landowners and managers to the planning table so the GWEB grants and other funds can be effectively utilized. Parts of the grant will be completed in 3 and 4 years. Everything will be completed in 6 years. Success will be measured by how many participate and write plans.

## Section 7. Project description

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

Type here (provide answers in paragraph form)

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This proposal is broad based and primarily deals with processes for helping people solve problems coupled with proven Extension techniques of applied demonstration and research. The delivery methods will be Extension type workshops, meetings and tours with publications, newsletters, and using the media. Evaluations will be done by impact statements from Extension and research personnel. Success will be measured in acceptance of the principles taught and demonstrated by the various agencies and landowners and managers.

The components are: educational; stream temperature categorization by type and management affects on stream health; tree protection and planting strategy, tree adaptability etc.; stopping soil erosion in Eastern OR. A detailed budget is attached as Addendum II.

**a. Background, educational: Objective 1.**

On an ecosystem basis, personal values land management is changing to include ecosystem values land management. Land owners/managers making these decisions individually and through partnerships need research-based information related to ecosystem management.

There are a number of state initiatives/programs that aim to mitigate watershed health problems through the use of voluntary practices (Governor's Salmon Restoration Initiative, DEQ 303(D) list and Senate Bill 1010, Coastal Zone Management Act). All of these programs rely on landowners or land managers to develop management plans (with watershed councils, associations, or other public groups) and voluntarily make changes in their land management practices. However, there is no extensive educational program related to these issues and management alternatives. In addition, the public groups involved in these plans/projects (watershed councils, associations, etc.) have not had access to educational programs on community involvement, public policy, meetings management, and how to develop effective partnerships, as related to ecosystem management.

The Problem: Watershed Councils, landowners and managers, and the volunteer and paid workforce rely on understanding watershed processes and conditions, and knowledge of different enhancement practices so they can make decisions, voluntarily make management changes, and implement enhancement projects. There are a limited number of educational programs that teach watershed councils, their members, and other citizens about watershed processes, fish needs, water quality, monitoring, different enhancement practices, how to create successful partnerships, facilitate meetings, improve communications, etc.

Plan: The OSU Extension Service is creating a Watershed Stewardship Educational Program (WSEP), and workshops and a manual that help people write their individual plans.

The WSEP is a comprehensive watershed enhancement educational programs (consisting of curriculum, training materials and learning aids) that will enable target audiences to learn how to form effective partnerships, to assess conditions and develop strategies for mitigating or enhancing their watershed resources, and to implement effective

enhancement projects. In addition, the information could be used by a large variety of other audiences (volunteer interest groups, livestock and small woodland associations, policy makers, etc.).

The workshops and workbook for individual planning have been piloted in Lincoln and Grant Counties. Our goal is that these educational programs will be accepted by state and federal agencies directing state and federal resource restoration and management programs.

**Who Is Involved:** WSEP is a joint program of the Agriculture, Forestry, and Sea Grant Extension Program Areas. The program is led by Derek Godwin, Flaxen Conway and Mike Cloughesy. Other OSU Extension Faculty involved in WSEP to date include: Paul Adams, Pat Corcoran, Ralph Duddles, Kami Ellingson, , Ginny Goblirsch, Paul Heikkila, Dave Hibbs, Katy Kavanagh, Ron Miner, Bill Rogers, Viviane Simon-Brown, Garry Stephenson, and Jim Waldvogel.

Bill Rogers, Lincoln Co. and Gary Delaney, Grant Co. with Mike Borman, OSU Range, have spearheaded the individual planning workshops and workbooks.

Most livestock County Agents have been through one PFC assessment training so they can provide this education and service to landowners. A more extensive training is scheduled for May, '98.

**b. proposal, Objective 1:**

Conduct educational workshops for agencies and landowners and managers around the state starting fall of 1988.

a. The first step is the development of the WSEP Curriculum. This should be completed by April 1998. The outline of the WSEP Curriculum is included as Addendum 1.

b. The second step is the teaching of three pilot training sessions on the South Coast, Central Coast and North Coast. The curriculum will be the backbone of the training sessions, but every training will not necessarily involve the entire curriculum. Training's will be co-sponsored by Watershed Councils or groups of Watershed Councils, Extension, SWCDs, etc. The exact form of each training will depend on the local needs. However, the curriculum will be coast-wide and state-wide in scope.

c. This initial WSEP Proposal is a pilot project and is being funded internally by the OSU Extension Service. When a proven program has been developed that is accepted by local Watershed Councils, then the manuals will be published.

d. Training will be conducted statewide for agencies, watershed councils, etc.

e. The planning workshop curriculum will be assessed and individual planning workshops will be conducted statewide.

**c. Rational and Significance, Objective 1:**

The rational is covered in the abstract above, there is a great need for agencies and others to learn how to work with, facilitate meetings, and have scientifically valid information to work with. The major agencies (BLM, U S Forest Service, NRCS) have agreed to use

Proper Functioning Condition (PFC) to determine stream health. It has many advantages, the major one being it does not require many years of data collection.

**e. Methods, Objective 1:**

Pilot and revise the WESP manual and the individual planning workbooks and workshops so they will teach the needed principals, including PFC assessment.

<b>Budget:</b> Publish 250 books @ \$30	\$7,500
Travel and support revisions	2,500
Total	\$10,000 year 1
Train Coordinators and others	
Travel and support	\$3,000 year 2

Agents training for PFC assessment is included in Objective 3 as it is intertwined with other training and reporting that is needed. PFC's by agents will be done in relation to other activities listed below.

**f. g. facilities are on campus and extension offices**

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**a. Background, categorize stream temp. by type, Objective 2:**

Temperature standards are being used by agencies to determine stream health for salmon and other fish in Oregon. However, there is extream disagreement on what is a normal temperature for streams in excellent condition.

Extension Agents and other OSU staff have been involved in a few studies on stream temperatue across the state but have been extreamly limited by funds and available time. The OSU Rangeland Resource Department has used graduate students to collect 5 years of data on two streams in the Silvies watershed, Grant County. The streams will need a PFC assessment done and the assessment related back to the data already collected.

The Department also has a graduate student lined up for a two year theses study starting in summer '98, to take the Rosgen Stream Classification System and apply it to the three types of streams in Eastern OR that have a high PFC.

**b. Proposal, Ojective 2:**

Gather temperature data on the three main types of streams in Eastern OR, streams that are in the best PFC that can be found. Determine if there are major differences between stream types.

- a. Years 1 & 2 - Locate the best condition PFC streams that can be found, each of the three types, in Eastern OR, total about 17.
- b. Install monitoring systems. c. Take flow and temperature data every two weeks June through September. d. Analyse data by stream type

**c. Rational and Significance, Objective 2:**

There is a lot we do not know about stream function and how the level of function influences stream temperature patterns. There are many different stream types as defined by morphological characteristics (Rosgen 1996).

It is unknown if stream temperature patterns are different for different streams. Research is needed to determine if different stream types ( by PFC) exhibit the same temperature regime. Once this is known then appropriate management options can be developed.

Stream health or quality are being determined by temperature standards and the state's 303D list of streams not meeting standard are based on a temperature of 64\* F. We should have an exhaustive list to see what already exists in the best streams that can be found.

Determine what and how much affect management changes have on stream health; vegetation and/or temperature.

**e. Methods, Objective 2:**

PFC assessments on the approximately 17 streams will be conducted by the OSU Rangeland Resource Dept and Extension Agents as trained. The monitoring is included in objective 3 below.

Tamzen Stringham is research associate with Rangeland Resources, OSU. She would be involved in agent training and coordination for PFC assessment. Bill Krueger, John Buckhouse, Mike Borman, Rangeland Resources, OSU, would do the needed PFC assessments, train coordinators.

\$6000 travel for Rangeland Resources per year

**f. g. Are the same as objective 3 listed below and are included there.**

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**a. Background, show management affects on stream health; temp., vegetation, Objective 3**

Agencies are recommending many management changes to lower temperatures in the 91 listed 303D list in Oregon. Landowners and managers want to know how much management changes will reduce temperatures so they have some assurance that what they put money and effort into will result in streams that meet standards.

Current research and Extension efforts: The Union Livestock Experiment Station and the Agriculture Economics Dept. has completed 3 years of a 5 year study on off stream watering effects on stream health. Not only has stream health improved but there is a positive return to the cattle owner due to better livestock grazing distribution (DelCurto and Tanaka).

The department is developing a computer model that predicts and analyses the relationship between water heating and shade potential. As tree planting and other demonstration and research sites are established this program can track actual versus predicted affects (Moore and Miner).

Other Experiment Station and Extension Activities; Ranch Water Quality Planning workshops Lincoln County (Rogers and Borman), training's on watershed improvement based on the Nez Perce Tribe Habitat Recovery Plan Wallowa County (William's), off stream watering project Harney County (Chamberlain), Burnt River stream temperature modeling study Baker County (Carr and Borman), limited study of Anne Creek Klamath County (Hathaway), Water Quality Handbook piloted in Grant County (Delaney).

**b. Proposal, management affects on stream health, Objective 3**

a. Years 1 & 2 - Locate functioning at risk streams in Eastern OR, enough to establish research and demonstration sites that will be beneficial to the new DEQ and ODA technical representatives, Watershed Councils, ODF&W, other agencies, and particularly



1000 travel for students Total, 17 = \$17,000 per year  
Agents must come to OSU at least twice, once before projects start and once to finalize data and reports each year. They need substantial travel to do PFC's.

\$5000 travel for agents to campus Total \$5,000 per year  
2000 travel per agent in county to do PFC assessments, 17 = \$14,000  
Total, \$19,000 per year

Luanne Sweygert of the Oregon Cattlemen's Association is a resource person who works on stream health with landowners. We would use her to help with coordination and collaboration with landowners.

\$5000 travel for OCA representative per year

Four coordinators for water quality monitoring effort (Columbia Basin, Central OR, Snake River, SW and Coastal). They will help Agents pick sites, coordinate structures and management changes, get site information recorded, do data analysis @

\$40,000 salary  
12,800 other payroll expense  
10,000 travel

Total \$62,800  
Four \$251,200 per year  
one time costs

\$6000 computer equipment  
6000 projection equipment to present educational information  
Total \$12,000  
Four \$48,000 one time capital

**f. Facilities, Objective 3**

County Extension offices are available to house the coordinators. Extension agents are already located in the counties and many already have extensive training. Needed additional expenses such as travel are covered by this grant.

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**a. Background, Accertain suitable tree protection, planting spacing, Objective 4:**

Planting trees on streambanks are supposed to shade streams enough to drop the water temperature. Agencies are proposing and some have cost shared planting trees along streams. A small project is underway in the Coast Range using different tree spacing and species (Emmingham and Bishaw)

**b. Proposal, Accertain suitable tree protection, planting spacing, Objective 4:**

Demonstrate the feasibility of using various tree species, planting layouts, tree protection methods, for lowering stream temperatures and stabilizing banks. Use poplar clones from Klamath and other sources for poplar, alder, conifers as well as Willows to plant riparian areas in Klamath, Lincoln and other counties.

Experiment with planting the larger trees in clusters, or spacing them 50' apart, and using different methods of tree protection such as non-climb wire on steel posts. Electric fence could also be used at critical times of the year. The conifers would be planted between the faster growing species to eventually provide long term durable wood.

**c. Rational and significance, Objective 4:**



Propagate the most promising poplar clones and native stock from the Klamath Experiment Station using master gardner volunteers.

**c. Rational and Significance, rank and make available tree species, Objective 5:**

According to agencies involved durable (harder) wood and larger wood is preferable along stream banks as it provides more fish habitat when it finally falls into the stream. Taller trees provide more shade than shorter trees like willow. Poplar trees, especially the new clones for fiber production are extremely fast growing although a soft wood. They are very tall and large in less than 10 years.

**e. Methods, Objective 5:**

- a. Year 1 - establish nursery at Klamath Falls with master gardner volunteers,
- Year 2 - make rooted stock available to 10 Klamath ranches
- Year 3 - continue distributing rooted stock, solicit private nurseries to take over production

Budget: Klamath Nursery with volunteers                      \$4,000/yr O & M

**f. Facilities, Objective 5:**

A site will be solicited on the Klamath Experiment Station or at one of the master gardeners operations. Master gardeners are a very active group in Klamath Falls and tackle projects such as this one. The O & M will be for irrigation drip tube etc. The Klamath Co. Extension office is available and one of the Extension Agents (Rod Todd) is interested in spearheading this effort.

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**a. Background, stop soil erosion on wheat fallow, Eastern OR, Objective 6:**

According to analysis of the long term (60 year) plots at the Columbia Basin Agriculture Research Center, Pendleton OR, (Rasmussen and Duff, '92) the dryland wheat fallow farming system is not biologically nor economically sustainable. Biologically it is not sustainable because one summer of fallow every other year oxidizes organic matter, in most cases organic matter is now half of what it was under grass; water erosion is tremendous when rain falls in the winter time on frozen soil when wheat is planted on fallow ground.

No-till seeding was tried in the Columbia Basin in the early 1980's. It was a failure due to a lack of alternate crops, a lack of proper registered pesticides which caused weed and disease pressure, and the high cost of equipment just before the farm crisis of the mid 80's.

Substantial work has been done by OSU Extension and Research in Oregon's Columbia Basin on alternate crops and intensive cropping since 1986. There are more registered pesticides available and fertilizer timing and application methods have been researched and are changing, better varieties are available. In '96 and '97 a series of annual spring crop demonstrations were conducted in the Basin resulting in positive returns. In '97 paired sites were run with conventional seeding compared to no-till seeding of spring crops. No-till did maintain yields compared to conventional planting ( Stoltz, Macnab, Karow, unpublished data)

Some innovative producers have been using the information provided by Extension and

converted some or all of their operation to annual crop or flex crop systems. So far yields only dropped marginally compared to wheat fallow yields.

In the fall of '97 a EPA grant was obtained from their Geographic Resource Initiative funds targeted to only the Umtilla River watershed. This \$80,000 grant is being used to fund cost shares for using no-till seeding. The cost share is \$10 per acre seeded up to a maximum of 200 acres for any one producer. \$12,000 of the money goes to Extension to do needed research such as Wild Oat control in no-till, spring cropping demonstrations in the Umatilla Basin, etc. \$68,000 will be used for producer cost share. This is a one year grant.

So far 1200 acres were seeded the fall of '97 and over 2000 acres are committed by growers for the spring of '98 in the Umatilla River watershed. It is anticipated that all of the cost share money will be used covering 6800 acres. Extension has made one on one contact with every producer involved to consult on seeding rates, rotations, fertilizer rates and placement, herbicides, varieties, etc. to enhance the chance of success.

Equipment dealers in Eastern OR are taking a large interest and many have purchased or leased no-till drills to rent to producers. Most of them are cutting the rental rate below custom farming costs (from a standard of \$22 per acre to about \$15 per acre for drill and tractor). The producer pays for seed, fertilizer, and operator of the equipment.

The dealers cut rate plus this incentive cost share takes a large part of the risk out of trying the new system. The producer will be able to try different equipment and different rotations with the new technology before making a purchase or making a large switch in their farming system.

**b. Proposal, stop soil erosion, Objective 6:**

a. Choose 8 to 10 cooperators across Oregon's Columbia Basin to plant annual crop no till strips 30' x 700' of spring wheat, spring barley, spring canola, yellow mustard. Where the climate is favorable also plant garbanzos, lupine, lentils. Compare spring no-till seeding to conventional spring seeding where possible.

b. Have at least the following number of producers seed 10,000 acres annual crop no-till in each of the next 4 years ('98 - '01).

Umatilla	20 growers	4000 acres
Morrow	5	1000
Gilliam	5	1000
Sherman	10	2000
Wasco	<u>10</u>	<u>2000</u>
Total	50 growers	10,000 acres

**c. Rational, stop soil erosion, Objective 6:**

We do know that a large amount of sedimentation in streams comes from eroding banks in high flows and from water erosion off fields in Eastern Oregon that are under a wheat,

summer fallow rotation. Stopping those high flows and sedimentation from the huge wheat region of Oregon's Columbia Basin would greatly affect the water quality of the Grande Ronde, Umatilla, John Day, and Deschutes Rivers and their tributaries. Annual cropping and no-till seeding virtually eliminate soil erosion from fields according to NRCS data and high flows would be substantially reduced.

Economically wheat fallow rotations are not sustainable because of the continuing cost price squeeze. Yields are only increasing marginally, prices are not increasing and are subject to wild swings in the market, and prices of all inputs continue to go up.

With the "Freedom to Farm" 1996 Farm Bill government constraints on what can be grown are gone. As subsidies are phased out by the year 2000 grower are asking for help on increasing their bottem line.

Annual cropping may increase income and no-till seeding has the potential to cut costs while maintaining yields. There is tremendous risk to the producer to make this switch. Sometimes yields are erratic, in fact can be quite poor, the first year or two. A dry spring may really hurt the chance of success. Therefore to change farming systems, especially one with higher risk, there must be a way to reduce the risk for the producer willing to change. Demonstrating alternate crops in their area really helps, and cost sharing a big expense allows a management change without endangering the farm financial health.

**e. Methods, stop soil erosion, Objective 6:**

**Budget:**

\$10 per acre, up to 200 acres, cost share to growers who use no-till commercial drills  
 \$100,000 per year, years 1 through 4 O & M

**Budget:**

8 to 10 sites annual crop no-till across the Columbia Basin each of 4 years

seed, fertilizer, chemical	\$4,000	supplies
equipment use	\$5,000	O & M
part time labor	\$5,000	
¾ ton pickup rent for weigh wagon	3,000	O & M
travel for agents	2,000	
Total	\$19,000	per year, years 1 thru 4

Coordinator for annual crop no-till planting demonstrations and no-till cost share program. They will help Agents pick sites and cooperators, coordinate equipment dealers, get site information recorded, coordinate other needed research, do data analysis @

**Budget:**

\$40,000 salary	one time costs
12,800 other payroll expense	\$6000 computer equipment
10,000 travel and support	6000 projection equipment to
Total \$62,800 per year, years 1 through 4	present educational infoormation
	total \$12,000 year 1, capital

Educational efforts by Extension; summer tours are scheduled in every county with good participation by producers, winter meetings such as the Columbia Basin Wheat Seminars are utilized to present results. One on one consultation with producers will continue and is the proven method for success when major changes are attempted. (see objective 1. F.)

**f. Facilities, Objective 6:**

The no-till and conventional experimental equipment and weigh wagons are at the Columbia Basin Agriculture Research Center and are available as is the truck and trailer to haul them to sites. Equipment dealers in the Basin now have no-till drills to rent.

**b. Proposal objectives.**

Type here (provide answers in paragraph form) see above by category

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

Type here (provide answers in paragraph form) see above by category

**d. Project history**

Type here (provide answers in paragraph form)

**e. Methods.**

Type here (provide answers in paragraph form) see above by category

**f. Facilities and equipment.**

Type here (provide answers in paragraph form)

**g. References.**

Type here (provide answers in paragraph form) see above by category, much of this is work in progress and demonstration.

**Section 8. Relationships to other projects**

Type here (provide answers in paragraph form)

This project to be successful requires working with local Watershed Councils, the ODA and DEQ watershed managers, ODF&W, Forestry and others. These other entities will be formulating plans with individuals and groups. This project will train and help them in negotiation and group process.

This project will give agencies needed information from the applied research and demonstration components to be credible with the clientele. Clientele will have experienced some of the research and demonstration first hand and will greatly aid in bringing about management changes.

## **Section 9. Key personnel**

Type here (provide answers in paragraph form)

Michael Stoltz, Regional Director, Oregon State University Extension Service, 1 FTE Extension Administration. Until December, 1997, was a 30 year County Extension Agent, 7 years in Eugene and 12 years in Pendleton. He is the project manager.

Donald Wysocki, Extension Soil Scientist, OSU Columbia Basin Agriculture Research Center, 1 FTE Soils Extension and Research. In position in Oregon and the Columbia Basin since 1985. He is the principle investigator.

William Krueger, Rangeland Resource Dept. Head, OSU, and Extension Rangeland Specialist, 1 FTE. 25 years at OSU, teaching, research and Extension. He is co-principle investigator.

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

Type here (provide answers in paragraph form)

The delivery methods will be Extension type workshops, meetings and tours with publications, newsletters, and using the media. Evaluations will be done by impact statements from Extension and research personnel. Success will be measured in acceptance of the principles taught and demonstrated by the various agencies and landowners and managers.