October 2000

PATAHA CREEK
MODEL WATERSHED
1999 Habitat Conservation Projects

Annual Report 1999

DOE/BP-12585-1

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PATAHA CREEK MODEL WATERSHED

1999 Habitat Conservation Projects

Cooperators:
Bonneville Power Administration
Washington State Conservation Commission
Washington State Department of Fish and Wildlife
Natural Resource Conservation Service
Umatilla National Forest, Pomeroy Ranger District
Farmers and Ranchers of the Pataha Watershed

October 2000

1999 Habitat Projects Completed

Completion Report – October 2000

Project # 99-21 Purchase Order # 99AP14994

Project # 94-18-7 Purchase Order # 98AP12585

Project # 97-88 Purchase Order # 00000356-00001 (97AP37117)

Project # 99-59 Purchase Order # 99-059-00 (99BI-19595)

Prepared for:

U.S. Department of Energy
Bonneville Power Administration
Environment, Fish and Wildlife Division

Washington State Conservation Commission

Washington Department of Fish and Wildlife

Umatilla National Forest, Pomeroy Ranger District

Natural Resources Conservation Service

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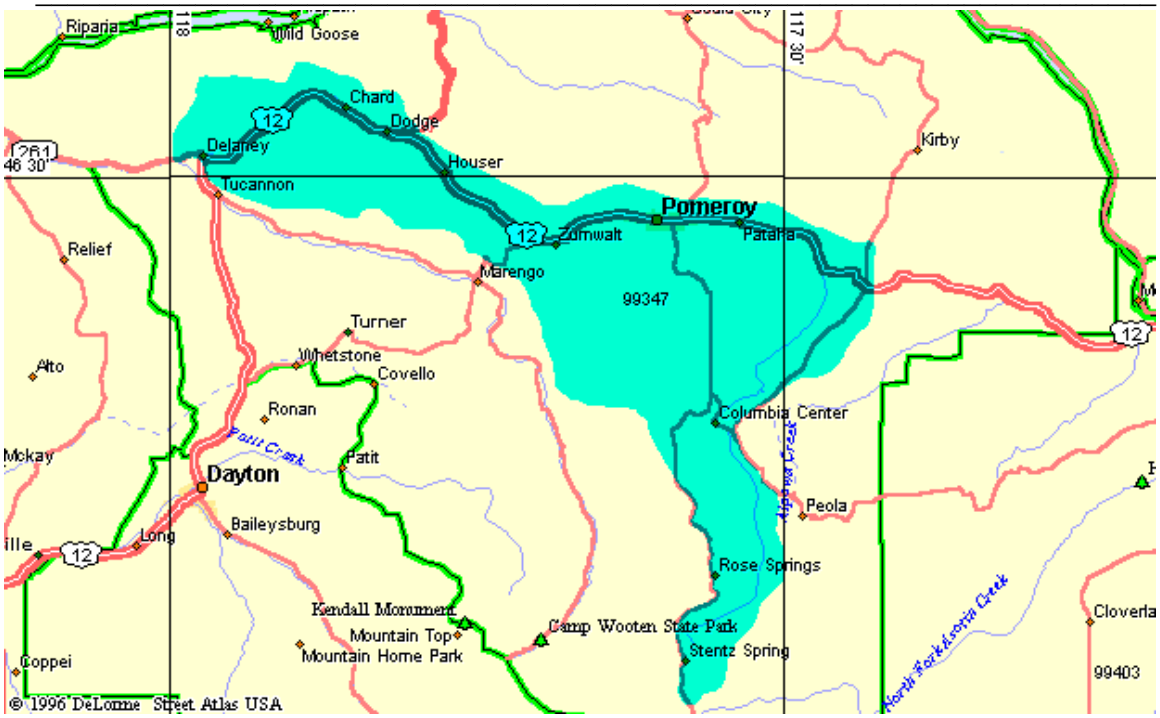

Pataha Creek Watershed

Located in Garfield County in SE Washington

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Abstract

The projects outlined in detail on the attached project reports are a summary of the many projects implemented in the Pataha Creek Model Watershed since it was selected as a model in 1993. Up until last year, demonstration sites using riparian fencing, off site watering facilities, tree and shrub plantings and upland conservation practices were used for information and education and was the main focus of the implementation phase of the watershed plan. These practices are the main focus of the watershed plan to reduce the majority of the sediment entering the stream. However, the watershed stream evaluation team used in the watershed analysis determined that there were problems along the Pataha Creek that needed to be addressed that would add further protection to the banks and therefore a further reduction of sedimentation into the stream.

1999 was a year where a focused effort was made to work on the upland conservation practices to reduce the sedimentation into Pataha Creek. Over 95% of the sediment entering the stream can be tied directly to the upland and riparian areas of the watershed. In stream work was not addressed this year because of the costs associated with these projects and the low impact of the sediment issue concerning Pataha Creeks impact on Chinook Salmon in the Tucannon River.

The Pataha Creek has Steelhead in the upper reaches and native and planted rainbow in the mid to upper portion. Suckers, pikeminow and shiners inhabit the lower portion because of the higher water temperatures and lack of vegetation. The improvement of riparian habitat will improve habitat for the desired fish species. The lower portion of the Pataha Creek could eventually develop into spawning and rearing habitat for Chinook salmon if some migration barriers are removed and habitat is restored.

The upland projects completed during 1999 were practices that reduce erosion from the cropland. Three-year continuous no-till projects are on schedule and the monitoring of this particular practice is ongoing. It's direct impact on soil erosion along with the economical aspects are being studied. Other practices such as terrace, waterway, sediment basin construction and the installation of strip systems is also taking place.

1999 was a very productive year for the Pataha Creek Model Watershed. All the upland practices that were implemented have helped to reduce erosion from the cropland. This has resulted in a reduction of sedimentation into the spawning and rearing area of the Fall Chinook salmon located in the lower portion of the Tucannon River. The tree planting projects have helped in reducing sedimentation and have also improved the riparian zone of desired locations inside the Pataha Creek Watershed.

Forward

Due to the high value of the fish resource in the Tucannon River, there have been many studies and planning efforts directed at restoring resource conditions in this watershed. Pataha Creek, as the largest sub-watershed in the Tucannon watershed has been identified as one of the primary contributors of sediment to the Tucannon River.

One of these studies was conducted by Frank Reckendorf and Mike VanLiew. They conducted a study from September 1985 to April 1986 to determine sediment intrusion into artificial redds in the Tucannon Watershed. Under this study, the textural composition of artificial redds was monitored over a 6 month period to determine sediment intrusion into salmonid spawning beds. The artificial redds were constructed in September 1985, at four sites on the Tucannon River in Southeast Washington. Freeze-core samples were then collected 4 times, from October 1985 to April 1986. The data indicated a marked increase in the percentage of fines and sand sized material present in the redds due to sediment intrusion from winter runoff on the Tucannon River. The apparent decrease in both pore size and relative permeability of the artificial redds due to sediment intrusion reflects a potential decrease in the survival-to-emergence of salmonid.

Under this study the affects of fine sediment and organic matter on salmonid reproduction have been studied intensively for more than three decades, both in situ and in the laboratory (Everest et al, 1987). Sands, silts, clays and organic matter that are deposited in gravel spawning beds -- referred to a redds -- adversely affect the survival to emergence of salmonid populations. Clogging of gravel beds by fine sediments and organic matter reduce the availability of dissolved oxygen needed by salmonid embryos and fry. Fine sediments that are deposited in gravel beds also restrict metabolic wastes produced by incubating salmonid eggs (Alonso et al, 1988). Moreover, fine sediments that clog the interstices of gravel spawning beds entrap the fry within the gravel as they try to emerge.

The following list are publications used in the preparation of the Pataha Creek Model Watershed Plan and also in parts of this proposal.

Sampling of Sediment Intrusion into Artificial Redds in the Tucannon Watershed (Reckendorf & VanLiew, 1989: This was a study completed under the authority of the Soil Conservation Service to determine the affect of sedimentation on artificial redds at four sites in the Tucannon Watershed.

Tucannon River Watershed Plan (USDA 1991): This plan was prepared under authority of PL-566 and recommends certain conservation practices that would lower water temperature and reduce the amount of sediment delivered to the

stream. This plan provides federal cost-share funds to private landowners to help establish the recommended practices. Instream habitat improvement, however, was not included as part of the planning or funding of this project.

Sediment Transport, Water Quality and Changing Bed Conditions, Tucannon River, Washington (Hecht et al. 1982): This plan identified and discussed the effects of land use and other watershed influences on the water quality and fish habitat of the river. It also discussed the effects of reduced water quality on the aquatic populations within the stream.

Ecological Investigations on the Tucannon River, Washington (Kelley and Associates 1982): This study is the second part of the 1981 USDA report listed above, and includes the related biological investigations for the report.

Southeast Washington Cooperative River Basin Study (USDA 1984): The objective of this study was to provide a basin-wide evaluation of existing land management and stream habitat conditions related to erosion and sediment problems.

Tucannon Basin Final Report - Assessment of Ongoing Management Activities (USDA Forest Service 1993): This report analyzes the potential impacts of forest activities, within the Umatilla National Forest, on Chinook salmon in the Tucannon River.

1999 Pataha Creek Model Watershed Projects
Budget Summary

BPA Contract #	BPA Project Name	Total Cost	BPA Funding	Landowner CS
97AP37117	Subsoiling	$2,308	$1,154	$1,154
97AP37117	No-till seeding	$8,032	$4,016	$4,016
97AP37117	Terrace rebuild	$401	$301	$100
98AP12585	Subsoiling	$26,606	$13,303	$13,303
98AP12585	No-till seeding	$46,529	$23,264	$23,264
98AP12585	Two pass seeding	$29,522	$14,761	$14,761
98AP12585	Sediment Basins	$15,242	$7,621	$7,621
98AP12585	Upland fencing	$201	$100	$100
98AP12585	Upland Buffer	$2,300	$1,150	$1,150
98AP12585	Grassed Waterways	$795	$397	$397
98AP12585	Terrace rebuild	$5,550	$2,775	$2,775
98AP12585	Streambank Protection	$1,776	$1,776	0
98AP12585	Tree Planting	$1,608	$804	$804
99BI-19595	Subsoiling	$9,150	$4,575	$4,575
99BI-19595	No-till seeding	$8,706	$4,353	$4,353
99BI-19595	Sediment Basins	$2,166	$1,083	$1,083
99BI-19595	Grassed Waterway	$1,326	$663	$663
99AP14994	Administration	$43,192	$43,192	0
	Totals	$205,410	$125,288	$80,119
		100%	61%	39%

Project: Watershed Project Coordination and Administration for 1999 using contract 99AP14994.

The Pomeroy Conservation District was provided a grant from the Bonneville Power Administration (BPA for the purpose of funding the administration of the implementation of the Draft Pataha Creek Model Watershed Plan. This plan was a pilot effort to encourage private landowners to join government agencies in finding solutions to loss of salmon habitat and critical riparian area. The goal of the plan was to set into motion efforts to return the upper Pataha Creek Watershed and lower Tucannon River to productive capacity for salmon spawning and rearing.

The Pataha's high delivery of sediment and high water temperatures into the spawning and rearing area of the lower Tucannon River was determined to be the main problem in the Pataha Creek Watershed.

The conservation district hired a watershed coordinator to bring together the technical experts of state and federal agencies with private landowners to jointly find solutions to habitat problems within the watershed. The technical representatives provide the scientific background and information on the critical needs of the fish while the landowners provide the common sense backstop to ensure that the action items suggested by the agencies are attainable, physically and financially within the watershed.

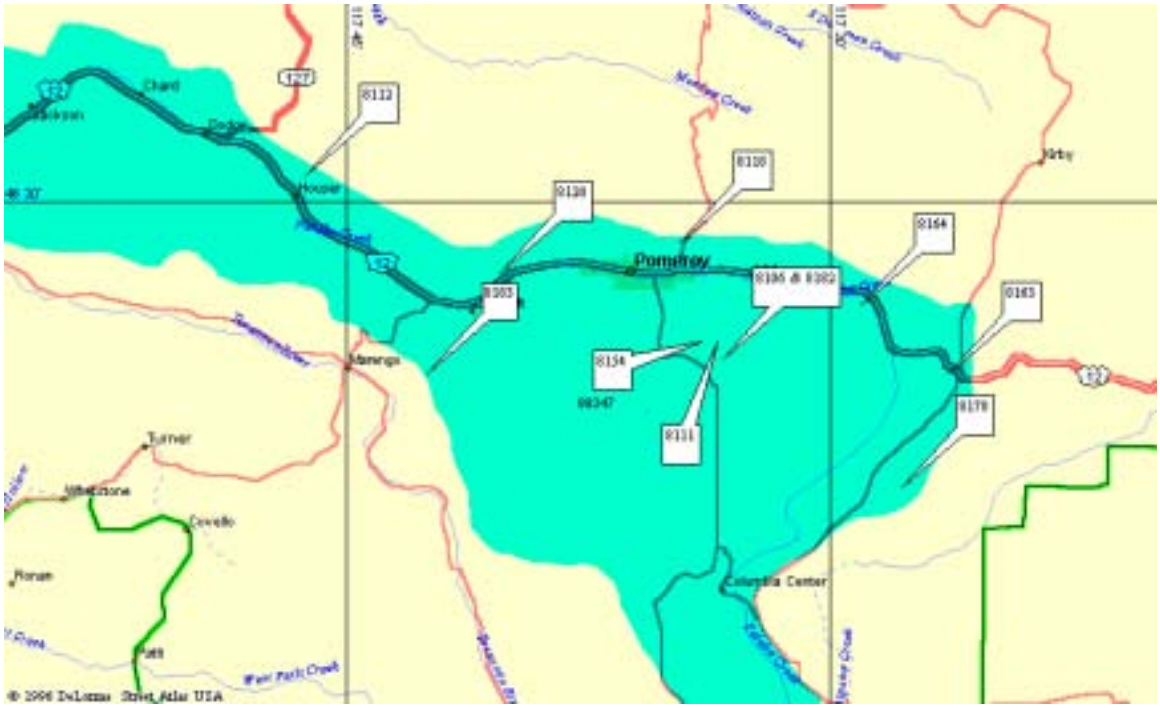
The Pomeroy Conservation District has worked with the Washington State Conservation Commission, Bonneville Power Administration, and the Natural Resource Conservation Service since the beginning of this pilot program. We have jointly implemented conservation practices to help reduce the erosion and resulting sedimentation moving from our uplands into the Tucannon River. We have also installed practices within the riparian area to improve bank stability, riparian vegetation and in-stream fish habitat.

These grants (98AP14994) were used for salaries and benefits for the coordinator and administrative assistant, travel expenses, and goods and services needed for the administration of these implementation grants.

The following summary reflects those expenses:

Salaries		
Coordinator	$15,756	
Clerical	$ 6,066	
Total		$21,823
Benefits		
Employment Sec.	$ 109	
Labor & Industry	$ 116	
Medicare	$ 316	
Soc. Sec.	$ 1,353	
Med. Insurance	$ 8,915	
Retirement	$ 2,340	
Total		$13,149
Goods and Services		
Admin. Support	$ 55	
Cellphone	$ 158	
Communications	$ 103	
Information Edu.	$ 1,505	
Internet Service	$ 200	
Office Supplies	$ 2,802	
Postage	$ 764	
Storage	$ 660	
Supplies	$ 12	
Support of existing Proj.	$ 115	
Weather Stations	$ 1,181	
Total		$ 7,556
Travel		
Annual Meeting	$ 270	
Regional Seminar	$ 394	
Total		$ 664
Total Coordinator expenses		**$43,192**

Project: Deep Fall Subsoiling in Pataha Creek Watershed
BPA Contract #97AP37117 and #98AP12585



Subsoiling completed in Pataha WS FY99

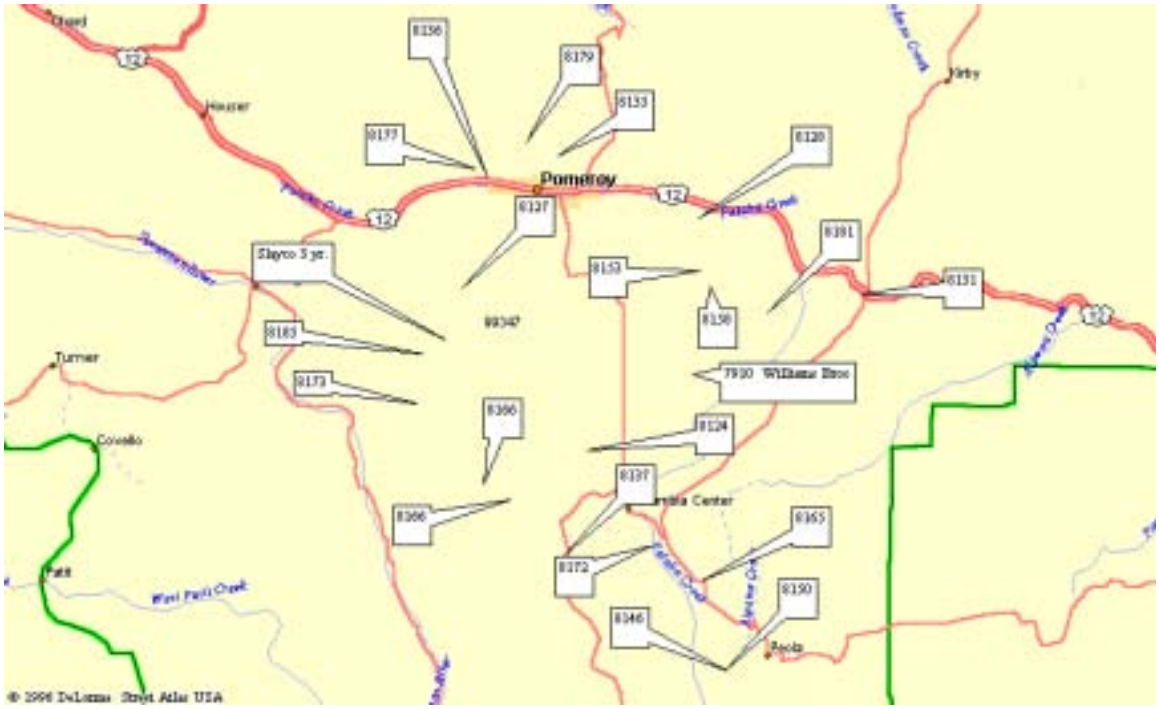
CS #	Operator	BPA CS	Operator CS	Acres	Tons soil saved
8106	Ken Ledgerwood	$1,154	$1,154	146	582
8112	Dick Ledgerwood & Sons	$1,791	$1,791	179	717
8118	Tom Herres	$ 885	$ 885	89	276
8120	Ken Ledgerwood	$1,690	$1,690	169	676
8154	Paul Kimble	$1,560	41,560	156	780
8163	Gilbert Farms	$2,140	$2,140	214	214
8164	Pataha Creek Farms	$2,432	$2,432	243	243
8178	Mike Flerchinger	$5,000	$5,000	500	500
8182	Ken Ledgerwood	$ 259	$259	26	51
8183	Ken Ledgerwood	$ 2,121	$2,121	212	850
Total		$19,032	$19,032	1,933	4,966 tons

R& R Subsoiler

The practice of subsoiling (Figure 1)breaks up the hardpan layer which develops over a long period of cultivation. This layer develops from 6

to 12 inches below the surface and restricts the infiltration of water that will eventually cause severe erosion on cropland.

Project: No-till seeding in Pataha Creek Watershed
BPA Contract #97AP37117, 98AP12585, & 99BI-19595



No-till seeding in Pataha WS 1999

CS #	Operator	BPA CS	Operator CS	Acres	Tons soil saved
3 yr.	Williams Bros	$2,385	$2,385	106	848
3 yr.	Slayco	$1,631	$1,631	73	653
8124	Shawley Family Limited	$1,200	$1,200	80	40
8127	Regie Waldher	$750	$750	50	100
8128	RC Farms	$1,005	$1,005	74	370
8131	Gilbert Farms Partnership	$543	$543	36.2	398
8135	Don Richardson	$4,479	$4,479	299	1194
8136	Herres Land Company	$1,230	$1,230	82	574
8137	Joseph Benson	$2,691	$2,691	179	538
8146	John Flerchinger	$750	$750	50	260
8150	John Flerchinger	$960	$960	64	192

8153	RC Farms	$921	$921	61.4	61
8158	Regie Waldher	$1,071	$1.071	71.4	357
8165	Max Scoggin	$1,275	$1,275	85	340
8172	Ledgerwood Farms	$953	$953	64	445
8166	Ken Ledgerwood	$2,621	$2,620	175	1,572
8173	Niebel Farms	$2,665	$2,665	177	177
8177	Herres Land Company	$1,200	$1,200	80	480
8179	Steve and Chris Wolf	$1,119	$1,119	75	298
8181	C&S Farms	$3,750	$3,750	250	500
8185	Slayco	$810	$810	54	378
	Totals	$34,068	$34,068	2,185	9,776

Figure 1 No-till seeding on chemical fallow

This drill (Figure 2) and others similar to this are used to no-till grain crops into soil that has remained undisturbed since the last crop. The drills are capable of preparing a seed bed, placing fertilizer and seeding in one operation. The advantage of this seeding system is the overall reduction in soil erosion and the improvement of soil health. When soil is not cultivated as it has been in the past, a much lower amount of carbon dioxide is released into the atmosphere. The soil is not left exposed to the elements and will not erode from the crop fields into nearby streams. No-till or direct seeding in conjunction with annual cropping and crop rotations is one of the very best ways to reduce upland erosion and the resulting sedimentation into our fish bearing streams.

Project: Two Pass seeding in Pataha Creek Watershed
BPA Contract #98AP12585 and 99BI-19595

Two pass seeding in Pataha Creek WS 1999

CS #	Operator	BPA CS	Operator CS	Acres	Tons soil saved
8098	Shawley Family	$1,550	$1,550	155	310
8130	David Dixon Est.	$1,485	$1,485	149	1040
8132	Randy Kausche	$800	$800	80	80
8133	Buddy Boyd	$1,258	$1,258	126	252
8134	Wessels and Chapman	$1,303	$1,303	130	301
8138	David Dixon Est.	$279	$279	28	28
8140	Pataha Creek Farms	$850	$850	85	850
8156	RC Farms	$1,303	$1,303	130	652
8159	David Dixon Est.	$1,197	$1,197	120	120
8160	David Dixon Est.	$1,068	$1,068	107	401
8161	Scott Davis	$662	$662	66	132
8162	L & M Ranch	$2,328	$2,328	296	1183
8167	Anna Marie Ledgerwo	$482	$482	48	48
8168	Warren Acres	$881	$881	88	264

8176	Bruce & Les Lyle	$3,398	$3,398	340	2,038
	Total	$19,114	$19,114	1,974	7,789

Figure 2 Straw Boss fertilizer applicator

The two pass system is very similar to no-till/direct seeding. The difference is that under a two pass system, the fertilizer is applied in a separate operation from the seeding of the crop.

Two pass seeding is as good as no-till in reducing soil erosion. It leaves large amounts of residue on the soil surface for protection against wind and water erosion. It opens up the ground so moisture may enter more readily.

Unlike no-till seeding, most two pass systems disturb the soil in such a manner that the overall soil health is not improved and larger amounts of carbon dioxide escape into the atmosphere.

The availability of the necessary equipment to do this conservation practice is much higher than a no-till operation. Most of the chemical and fertilizer dealers have the fertilizer equipment available and many have purchased drills capable of seeding into the high residue.

This practice is the next best thing to no-till and has brought many cooperators into the area of minimum tillage, annual cropping and crop rotations.

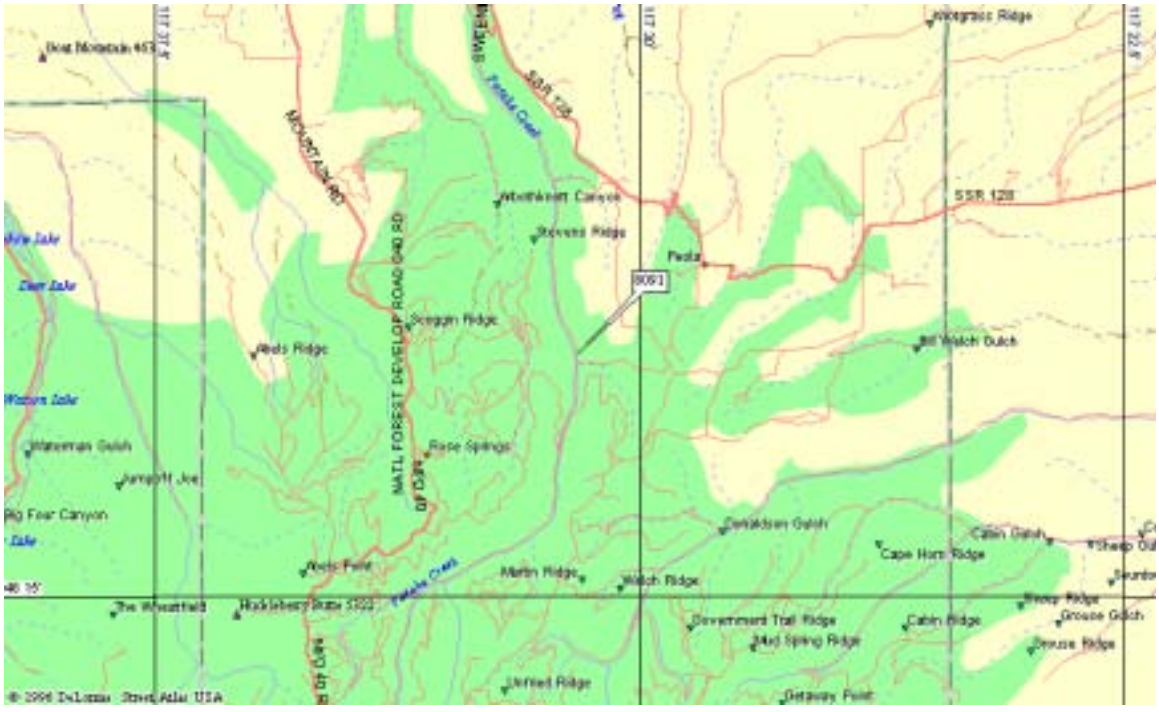
Project: Sediment Basin Construction and cleanout in Pataha Creek Watershed BPA Contract #98AP12585

Sediment basins installed in Pataha WS 99

CS #	Operator	BPA CS	Operator CS	#	Tons soil saved
8071	Warren Acres	$1,860	$1,860	3	57
8087	Gilbert Farms	$3,160	$3,160	7	565
8145	Pataha Creek Farms	$2,601	$2,601	4	49
8175	David Dixon Estate	$1,083	$1,083	3	125
	Total	$8,704	$8,704	17	796

Sediment basins are constructed at the ends of terraces or drainage's to collect sediment that is moving within the watershed and along these terraces. The basins slow the water to a point where the sediment of the runoff and collects in the sediment basins. The basins need periodic maintenance in the form of cleanout to remain effective drops out . Sediment basins aid to some degree in sediment reduction into our streams but are certainly not the only practice that should be utilized. The percentage of failure is relatively high.

Project: Riparian fencing installed in Pataha Creek Watershed BPA Contract #98AP12585



Riparian fencing installed in Pataha WS 1999

CS #	Operator	BPA CS	Operator CS	Acres	Tons soil saved
8091	Arlene Wolf	$100.50	$100.50	1	

In the Pataha Creek Watershed, riparian fencing is being accomplished through BPA Cost Share programs. As the picture shows, the riparian area along much of the Pataha Creek lacks protection to help stabilize the high stream banks. Riparian fencing has allowed the landowner to remove livestock from the areas of these high banks. This then allows them to establish trees and grasses on and along these banks to protect them from collapsing into the stream. New programs such as the new CREP program will allow more farmers access to funding in the county to implement this particular practice.

Project: Upland Buffer Strip in Pataha Creek Watershed BPA Contract #98AP12585

Upland Buffer Strip established FY99

CS #	Operator	BPA CS	Operator CS	Acres	Tons soil saved
8125	Warren Acres	$1,150	$1,150	4.6 ac.	37

This riparian buffer strip was cost shared with Herres Land Co. and also Washington State Department of Fish and Wildlife. The district cost share paid for a portion of the fencing while WDFW did the grass seeding on both sides of the stream. Buffer strips like this project the stream banks, filter out sediments from adjoining cropland and provide wildlife habitat.

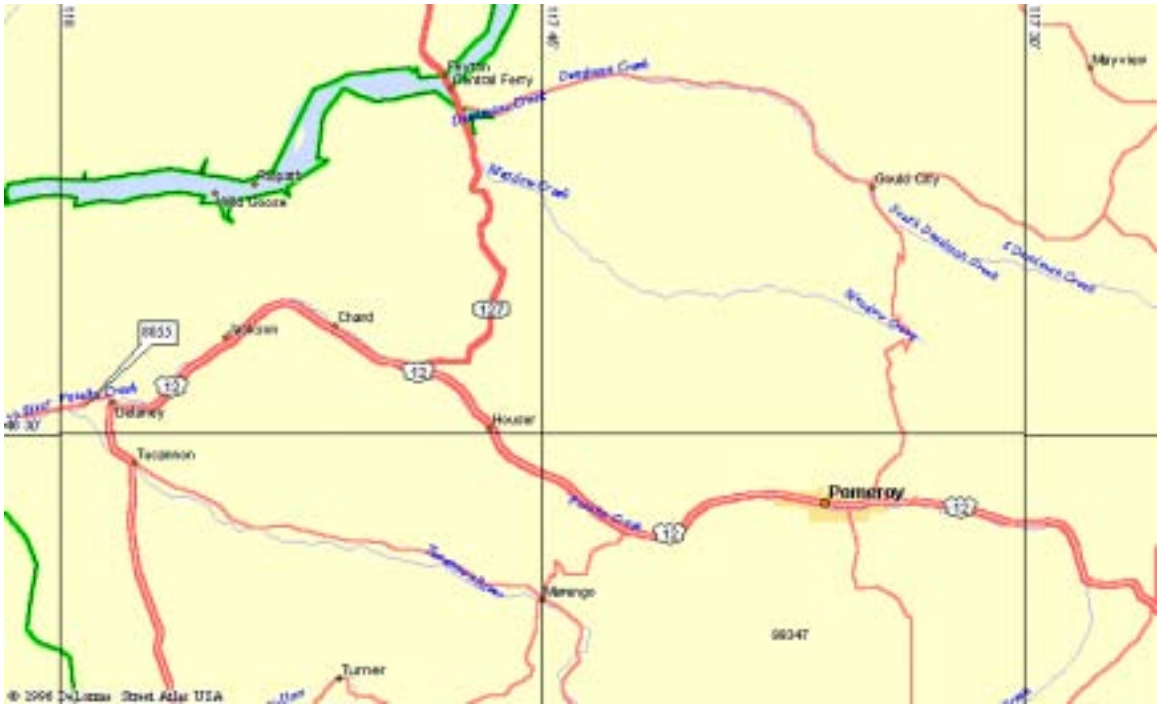
Project: Grass Waterways installed in Pataha Creek Watershed BPA Contract #97AP37117

Grassed waterways installed in Pataha WS 1999

CS #	Operator	BPA CS	Operator CS	Feet	Tons soil saved
8070	Warren Acres	$122	$42	230	230
8144	Gilbert Farms Part.	$275	$92	854	35
8175	David Dixon Est.	$663	$221	2350 ft	125
		$1,060	$353	3,433	390

Grassed waterways are used to reduce gully erosion in the drainage's within a field. The grass stabilizes the bottom and sides of the waterway and also collects sediment as it moves through the system. Waterways are placed at the ends of gradient terraces to transport the runoff from these terraces to areas where the cutting affect of the water is minimal.

Project: Streambank protection in Pataha Creek Watershed BPA Contract #98AP12585



CS #	Operator	BPA CS	Operator CS	Feet	
8055	Blaine Fletcher	$1,776	0	150	

This bank was stabilized to reduce the erosion caused by lack of vegetation and protection of the bank face. Even though this practice is not implemented to a high degree in the Pataha Creek because of the high costs, there are sites that benefit from it. Bank stabilization projects at strategic locations along Pataha Creek reduce bank erosion and the resulting sedimentation into the stream.

Project: New and reconstructed terraces installed in Pataha Creek Watershed BPA Contract 98AP12585

Terraces rebuilt and constructed in Pataha WS 1999

CS #	Operator	BPA CS	Operator CS	Feet	Tons soil saved
8093	Gary Houser	$753	$251	5,809	351
8147	Bob Bingman	$301	$100	1,790	105
8148	Bingman Farms	$582	$194	5,134	150
8170	Bob Bingman	$288	$96	1,340	50
8171	Bingman Farms	$899	$300	4,195	300
	Totals	$ 3,076	$ 941	18,268	957

Terrace construction on upper Pataha Watershed.

Terraces have been constructed in the Pomeroy CD and Pataha Watershed for many years. Two types of terraces are constructed or rebuild. They are the gradient terraces that are constructed at a grade around .5% to intercept the runoff and divert it off the field. They usually drain into a grassed waterway or sediment basin but some drain onto rocky sections of a pasture. They do not retain any water. Level terraces on the other hand are constructed to catch and retain the runoff that goes into them. They are larger than gradient terraces and are designed to hold the runoff above them. Terraces do reduce erosion to some degree but are prone to failure do to sediment and snow build up and do break and overflow on occasion.

Project: Tree Planting in Pataha Watershed during 1999

Tree planting in Pataha WS 1999

The Pomeroy CD utilized volunteer labor to plant over 10,000 willow and cottonwood whips and poles. The poles that were planted had a very high mortality while the whips survived extremely well. The planting of these trees are yearly programs. It will take several years to re-vegetate portions of the Pataha Riparian area.

One cost share payment was made to Dona Flynn for replacement trees used on our riparian demonstration project. This cost share amount was $804 was used against 98AP12585 and was 50% of the total cost of the replacement planting.