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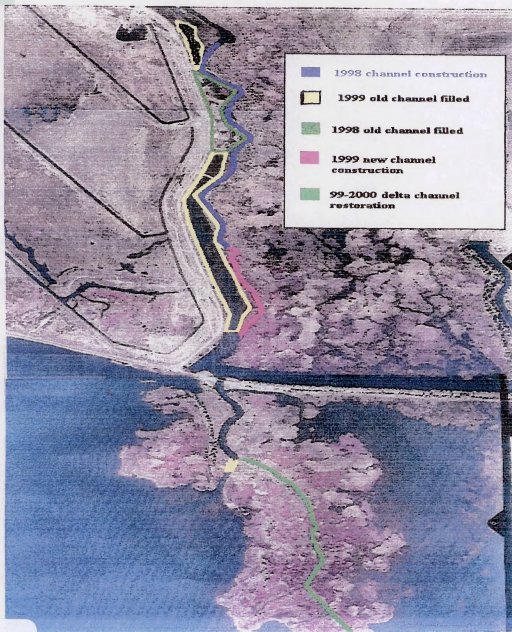


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WOOD RIVER WETLAND 1998 MONITORING REPORT

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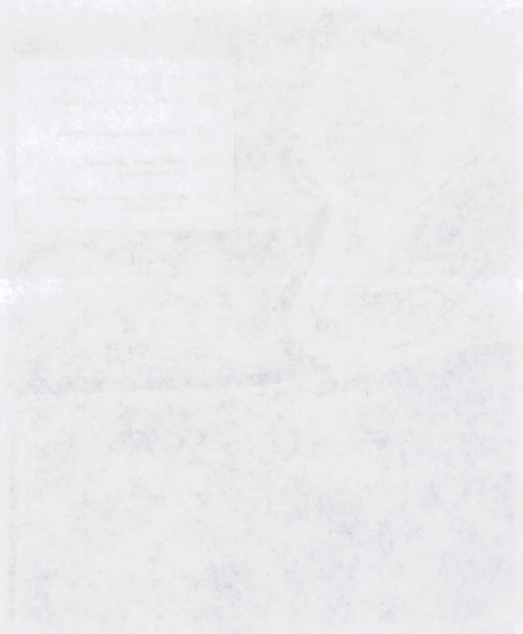
Bureau of Land Management
Klamath Falls Resource Area



QH
96.8
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W66
1996

WOOD RIVER WETLAND
1998 MONITORING REPORT

Division of Fish Management
North Carolina Department of Environment and Natural Resources



Monitoring Point	Location	Coordinates
1	Point A	36° 15' N, 78° 15' W
2	Point B	36° 15' N, 78° 15' W
3	Point C	36° 15' N, 78° 15' W
4	Point D	36° 15' N, 78° 15' W
5	Point E	36° 15' N, 78° 15' W





BUREAU OF LAND MANAGEMENT
Klamath Falls Field Office
2795 Anderson Avenue, Building 25.
Klamath Falls, Oregon 97603
E-Mail Address: Username@kfra.or.blm.gov
Website: 158.68.93.215



IN REPLY REFER TO:

1760 (OR014)

April 30, 1999

Dear Wood River Wetland Team Participant:

As part of our commitment to keep you informed, we (Bureau of Land Management [BLM]) are sending out this monitoring report, summarizing the activities completed during 1998 at Wood River Wetland Restoration. We are excited to share this information with you regarding the implementation of our management plan.

The construction work that has been completed thus far includes; **Phase 1**- north levee, ponds, channel meanders, and new pump station; **Phase 2** - center levee, filter ponds, and; **Phase 3** (approximately 50%) restoring the Wood River channel to its historic form and function. We anticipate another busy construction schedule for this field season. In addition to restoring the channel between the confluence of Crooked Creek and the Dike Road bridge, we are currently exploring the possibility of expanding our work to restore a 2/3 mile reach of historic channel in the old delta downstream of the bridge. We also anticipate continuing our recreation and interpretive improvements. In 1998, we paved the parking lot, installed bathroom, added a canoe launch, added a trail with benches and picnic tables. In 1999, we plan to add a second rest-room, interpretive display panels, a wetland boardwalk and some ditch crossings.

We are continuing to build partnerships and add to our funding base for this important restoration effort. Our list of committed partners include Oregon Trout, Ducks Unlimited, The Klamath Tribes, Klamath Basin Working Group, Ecosystem Restoration Office, Bureau of Reclamation, U.S. Fish and Wildlife Service, Oregon Department of Environmental Quality, U.S. Environmental Protection Agency, National Fish and Wildlife Foundation, Oregon Department of Transportation, Oregon Department of Fish and Wildlife, The Governor's Watershed Enhancement Board, Jim Root, Winema National Forest, U.S.F.S. Redwood Sciences Lab, Henley High School, Butte Valley High School, Lost River High School, Tulelake High School, High Desert Learning Center, and Klamath Basin Audubon. Through the hard work and support of these partners, we have secured funding for three of the four phases outlined in our management plan. We will continue to seek funding to carry out this important restoration project.

Thank you for your interest and support. We look forward to working with you on the Wood River Restoration project. If you have any questions about the project, please call Wedge Watkins at (503) 885-4110 or wwatkins@or.blm.gov.

Sincerely,

Teresa A. Raml
Area Manager

BLM
DSC Library - Building 50
Denver, CO 80225



Bureau of Land Management
Klamath Falls Resource Area
2795 Anderson Ave., Bldg. 25
Klamath Falls, OR 97603

WOOD RIVER WETLAND 1998 MONITORING REPORT

BLM-KLAMATH FALLS RESOURCE AREA (KFRA)

PROJECT TIME LINE

The project is designed to restore approximately 3,000 acres of wetland habitat. The Bureau of Land Management's (BLM's) project goals include improved water quality and quantity and improved habitat for two endangered fish species as well as other wildlife. The money spent in FY 98 went for final design, construction and monitoring of the first, second and third phases of the project plan implementation.

Phase 1

Phase one components consisted of the construction of 2 miles of dike and associated water control structures, the creation of two ponds in the northeast corner of the property, replacement of an existing pump station, a new drainage system designed to emulate original stream courses across the property, and the reconstruction of 0.5 mile of existing levee.

Construction of the new pump station was completed by *Ducks Unlimited* 9/96 (\$125,000). Two miles of dike construction (approximately 65,000 cubic yards), the installation of four new water control structures (full-round risers with screw gates and flash boards), and the creation of two ponds (approximately 20 acres total) completed by *Ducks Unlimited* 7/97 (approximately \$400,000).

U.S. Fish and Wildlife Service created 6 miles of meandering drainage channels and repaired 0.5 miles of existing levee. Completed 8/97 (contributed labor and equipment was approximately \$100,000).

Phase 2

A levee across the middle of the project area was reconstructed (1.8 miles and 60,000 cubic yards). Two settling ponds (30 acres total) were constructed in front of the two pump stations. These ponds will serve as final treatment for water to be pumped from the property. Three water control structures were installed in association with this middle levee and ponds (completed 2/98, approximately \$375,000). Four other water control structures were installed prior to June 1998 to complete phase 2 of the restoration at an additional cost of \$85,000.

Phase 3

The third phase of the project is to restore the lower 1.8 miles of the Wood River, from the confluence of Crooked Creek south to dike road bridge, to its historic form and function. This phase of the project is designed to improve refugial habitats for the early life stages of endangered suckers, fish passage, and instream habitat for trout, and provide a wider floodplain with improved riparian and wetland habitat for waterfowl and neotropical migrant birds.

Oregon Trout is the lead partner providing technical and financial support for this phase of the restoration project. Construction of this phase began in September of 1997, with the stockpiling of materials and creation of approximately two acres of wetland habitat. Approximately 40% of the construction work was completed during 1998. The cost for the 1998 construction was approximately \$500,000. The remainder of the work will be accomplished in 1999. Currently, our technical design and planning team is evaluating the possibility of extending the channel restoration work to include a 3,300 foot section of historic channel south of the dike road bridge. Restoration of this delta stream channel could greatly improve refugial habitat and water quality.

Phase 4

The final phase of the Wood River Wetland restoration project will be to develop a more sinuous and diverse interface along Sevenmile Canal. This would involve a two mile reach of existing levee. This phase of the project will provide improved refugial habitat for larval and juvenile fish, as well as improved nesting and brood-rearing habitat for waterfowl and neotropical migrant birds. Implementation of the final phase is expected in 2000. Potential partners include Ducks Unlimited, Oregon Trout, Water for Life, Trout Unlimited, and the Bureau of Reclamation.

Partners

A diverse group of partners, committed to restoring the Klamath Basin Ecosystem, is making this project a reality. To date, Federal partners are Klamath Basin Working Group, BLM, Bureau of Reclamation, U.S. Fish and Wildlife Service (Klamath Basin Refuges), Klamath Basin Ecosystem Restoration Office, National Fish and Wildlife Foundation, Winema National Forest, U.S. Forest Service Redwood Sciences Lab and the U.S. Geological Survey.

Non - federal partners to date are The Klamath Tribes, Oregon Trout, Ducks Unlimited, The Governor's Watershed Enhancement Board, Oregon Department of Environmental Quality, Oregon Department of Transportation, Jim Root Ranch, Concerned Friends of the Winema, Oregon Shores Recreation Club, Oregon Department of Fish and Wildlife, Oregon Wetlands Joint Venture, Klamath Basin Audubon, Henley High School, Lost River High School, Tulelake High School, Butte Valley High School, Chiloquin Elementary School, High Desert Learning Center and Oregon Wetlands Joint Venture.

More information about this monitoring report, or the Wood River Wetland project, is available by contacting Wedge Watkins at the Klamath Falls Resource Area (541)-885-4110, or wwatkins@or.blm.gov.

WATERFOWL

Historic Property Management

From 1985 through 1994, this property was managed as irrigated pasture land for beef cattle production. Under this management objective, the mode of operation was as follows. Water that accumulated on the property over the winter was pumped off beginning in February or March. Pumping continued until the property was without surface water except in the drainage canals. This condition was usually achieved by approximately May 1. Cattle were trucked into the ranch beginning in April and turned out on the north half of the property. Approximately 1,300 cow/calf pairs grazed the property through November with some variation in these dates due to weather. The property was usually irrigated during July, August, and September. Under this management scenario open water was limited to the drainage ditches from May to December. Nesting cover was also limited to a few areas that were not grazed in the previous year. Spring and fall forage for migrating geese was abundant. Vegetation on the property was dominated by grasses, sedges, and weeds. In 1995, much of the property remained wet, resulting in dramatic changes in vegetation (away from grasses), and increased waterfowl use primarily by ducks.

Management in 1997

Management of the property in 1997 was essentially the same as in 1996. Pumping of accumulated water, was initiated in February and completed in May. The property was completely dry by July first, in preparation for construction activities. The entire property was again dominated by grasses and sedges. Forbs were also abundant in spots during the spring. Aquatic smartweed was less abundant than in 1995 and hard stem bulrush increased.

Management in 1998

Water management in 1998 was somewhat different than in previous years. Due to the need to complete earth moving and water control structure installation, the property was kept dry from January through April. After the construction work was completed, the property was flooded in May. Water levels averaged approximately 14 inches over the south half of the property and approximately 4 inches on the north half. These water levels were maintained through July. The need to salvage wetland plants from the south half of the property resulted in a general drying of the property during August and September. Open water was restricted to the ponds and channels during this time. The south half of the property was reflooded during November for waterfowl hunting.

Field Observations in 1998

Waterfowl and shore birds appeared to respond well to the water management in 1998. Goose production appeared to be improved over 1997.

In 1998 we attempted to quantify duck production for the first time. The brood count conducted during August was impressive, both in the number of birds and in the variety of species observed with broods.

The acquisition of approximately 7,000 acres to the west of Wood River Wetland by the Bureau of Reclamation (BOR) greatly influenced waterfowl during 1998. Because of the timing of the acquisition, the BOR property was not grazed during 1998. In fact it was flooded with approximately 18 inches of water throughout the summer and fall. This provided excellent habitat for resident and migrating waterfowl, with peak numbers exceeding 300,000 birds.

Periodic flights have been made over the property during the past five years (except May-August) by the U.S. Fish and Wildlife Service. Results of those flights are displayed in Table 2.

Wood River Wetland Waterfowl Brood Count 1998

On August 4, 1998 a waterfowl brood count was conducted on the south half of the Wood River Wetland. The survey was conducted between 8:00 a.m. and 12:00 p.m., on approximately six miles of channels using a combination of canoe and pick-up trucks. Two observers, used binoculars to determine species, number of young, age of young, and presence of adult birds with the brood. Table 1 reflects the data collected during this one day of observation. The survey did not count young of the year birds observed in flight. Gadwall hens were observed incubating eggs during the time of survey. As a result, early broods and late broods are not represented in this data.

Table 1 BROOD COUNT DATA 8/4/98

Species	Total Young	Misc. Notes
Gadwall	541	Many gadwall hens were still on nests.
Cinnamon Teal	174	
Mallard	84	Several mallard broods were already able to fly, and were not counted.
Shoveler	19	
Ruddy Duck	19	
Ring-necked Duck	14	
Scaup	14	
Coot	4	
Horned Grebe	2	
Eared Grebe	2	
Total Production	873	

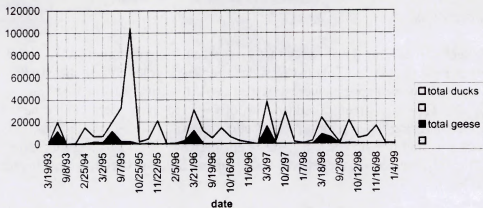
Several family groups with young of the year birds were observed in flight. No attempt was made to estimate production based on these observations. These family groups included Canada geese, mallards, cinnamon teal, pintails, black necked stilts, common snipe, long billed dowitcher and white faced ibis.

Conclusions

Wetland vegetation and waterfowl responded positively to the changes in water management during 1998. Although this limited data can not provide any far reaching conclusions, it does show that water level management is a critical factor in achieving the long term project goals. This year (1999) will be the first year that construction activities will not influence wetland management at Wood River Wetland. The ability to flood each half of the property, at different water depths, will be implemented throughout the growing season. This should greatly increase management options and habitat effectiveness. We hope to see waterfowl use and numbers responding to this new management during 1999. By 2000, the effects of wetland restoration on waterfowl will have become more evident.

Table 2

Total Ducks and Geese



NEOTROPICAL MIGRATORY BIRD AND YELLOW RAIL SURVEYS

Introduction

The third year of the Bureau of Land Management's (BLM) baseline monitoring for neotropical migratory birds was completed at the Wood River Wetland in July 1997.

Major wetland and river restoration work was initiated during late summer in 1997; therefore, changes in habitat conditions warranted the end of baseline monitoring for this group of species.

Monitoring efforts conducted by the Redwood Sciences Lab (RSL), Pacific Southwest Research of the U.S. Forest Service, continued in 1998 to collect data on demographics and use of the area during fall migration. This study is being conducted under an interagency agreement between the U.S. Forest Service and the Bureau of Land Management.

Surveys for yellow rails were conducted by The Nature Conservancy on the northeast portion of the property where restoration work has been completed. In addition, mid-winter bald eagle counts have been conducted by BLM personnel on the property for the past two years.

Methods

In 1998, sampling at the "Monitoring Avian Productivity and Survivorship" (MAPS) site continued at Wood River to collect data on reproductive success, use of the area during fall migration, and overall trend for neotropical migratory birds. The methods involved for monitoring under this study include mist netting, point counts associated with mist net sites during the breeding season, and area search at the mist net sites during fall migration. The site is sampled from mid-May through the end of October.

RESULTS AND DISCUSSION

Neotropical Migratory Birds

A total of 154 bird species, including 11 not previously observed, were documented at Wood River as of November 1998 (Table 3). This list includes species detected during the MAPS study. Eight of the eleven new bird species were detected by RSL during mist netting and censusing. Of these, three species (green-tailed towhee, olive-sided flycatcher, and red-naped sapsucker) were detected during the breeding/post breeding season. Four species (brown creeper, spotted towhee, varied thrush, and white-throated sparrow) were detected during the fall migration period. The red-breasted sapsucker was found during both the breeding/post breeding and fall periods (Table 4).

The six most common neotropical migratory bird species captured during the breeding/post breeding period, in order of abundance, included the song sparrow, American robin, red-winged blackbird and yellow warbler, brown-headed cowbird, and Wilson's warbler. There were 30 Wilson's warblers captured one morning in late May; these birds, were likely migrating through the area. During subsequent sampling days conducted during the peak of the breeding season, only four were captured. This species was rarely encountered during BLM's point count surveys conducted from 1995 through 1997.

The five most common bird species captured through mist netting during the fall migration period, in order of abundance, were the hermit thrush, song sparrow, orange-crowned warbler, varied thrush, and fox sparrow. Except for the song sparrow, none of these species were detected during the breeding season surveys conducted by BLM during 1995, 1996, or 1997, and none were found by RSL during the peak breeding season.

With the exception of the song sparrow which is a year - round resident, these species likely used the area primarily for migration. Of these most commonly captured fall migrants, all except the varied thrush were also detected during 1997.

A few bird species rare to uncommon in the Klamath Basin (based on Summers 1993) which were first detected during 1998 included the white-throated sparrow and red-naped sapsucker. The yellow-breasted chat was captured again in 1998 for the second year. This species is "inexplicably found only as a transient, and is a difficult bird to find", (Summers, 1993). In addition, a colony of nesting tri-colored blackbirds was found along the north dike. Colonies of this bird have been found for the past four years, including 1998.

Yellow Rail

In 1998, the potential yellow rail habitat was flooded subsequent to completion of restoration work in that area. The presence of shallow water is one of the breeding habitat requirements for the yellow rail. During the 1998 breeding season, six territorial male yellow rails were captured and four of these were subsequently banded. Two of the six birds were recaptures that had been banded at the Four-mile Creek Wetland earlier in the 1998 season.

Bald Eagle

Mid-winter bald eagle counts were conducted during 1998 and 1999. Mid-winter counts are conducted annually on a nationwide basis during target dates in January. The route at Wood River consists of a 6-mile route around the perimeter of the property. In 1998, five immature bald eagles and one adult bald eagle were observed along the route. In 1999, two adult bald eagles and two immatures were documented. Bald eagles also have been frequently observed hunting at Wood River during the spring and summer months.

Future Monitoring

The MAPS study will continue as funding is available. Because the above data is preliminary, no conclusions can be made on the importance of the Wood River Wetland as habitat for migrating neotropical birds, or overall trend for these birds, at this time. Bald eagle mid-winter counts will continue indefinitely.

Table 3. List of All Bird Species Documented at the Wood River Wetland as of November 1998.

American avocet
American bittern
American coot
American goldfinch
American kestrel

American robin
American white pelican
American widgeon
Bald eagle
Barn swallow

Belted kingfisher
Black-billed magpie
Black-capped chickadee
Black-crowned night heron
Black-headed grosbeak
Black-necked stilt
Black tern
Blue-winged teal
Bonaparte's gull
Brant
Brewer's blackbird
Brown creeper *
Brown-headed cowbird
Bufflehead
Bullock=s oriole
California gull
California quail
Canada goose
Canvasback
Caspian tern
Cedar waxwing
Chestnut-backed chickadee
Chipping sparrow
Cinnamon teal
Clark's grebe
Cliff swallow
Common barn owl
Common loon
Common merganser
Common nighthawk
Common raven
Common snipe
Common yellowthroat
Dark-eyed junco
Double-crested cormorant
Downy woodpecker
Eared grebe
European starling
Ferruginous hawk
Forster's tern
Fox sparrow
Franklin's gull
Gadwall
Golden-crowned kinglet
Golden-crowned sparrow
Goldeneye
Grasshopper sparrow
Great blue heron
Great egret
Great horned owl
Greater white-fronted goose
Greater yellowlegs
Green-backed heron
Green-tailed towhee *
Green-winged teal
Hermit thrush
Hermit warbler
Horned grebe
Horned lark
House wren
Killdeer

Lazuli bunting
Least sandpiper
Lesser scaup
Lesser yellowlegs
Lincoln sparrow
Loggerhead shrike
Long-billed dowitcher
Long-eared owl
MacGillivray's warbler
Mallard
Marsh Wren
Merlin
Mountain bluebird
Mountain chickadee
Mourning dove
Nashville warbler
Northern flicker
Northern harrier
Northern pintail
Northern rough-winged swallow
Northern saw-whet owl
Northern shoveler
Olive-sided flycatcher *
Orange-crowned warbler
Osprey
Peregrine falcon
Pied-billed grebe
Pine siskin
Prairie falcon
Purple finch
Red-breasted sapsucker *
Redhead
Red-naped sapsucker *
Red-tailed hawk
Red-winged blackbird
Ring-billed gull
Ring-necked duck
Ross= goose
Ruby-crowned kinglet
Ruddy duck
Sandhill crane
Savannah sparrow
Scaup
Sharp-shinned hawk
Short-billed dowitcher
Snow goose
Snowy egret
Solitary vireo
Song sparrow
Sora
Spotted sandpiper
Spotted towhee *
Stellar=s jay
Swainson=s thrush
Tree swallow
Tri-colored blackbird
Tundra swan
Turkey vulture
Varied thrush *
Violet-green swallow
Virginia rail

Warbling vireo
 Western flycatcher
 Western grebe
 Western kingbird
 Western meadowlark
 Western sandpiper
 Western tanager
 Western wood-pewee
 White-crowned sparrow (gambelii)
 White-throated sparrow *
 White-faced ibis
 Willow flycatcher

Willet
 Wilson's phalarope
 Wilson's warbler
 Winter wren
 Wood duck
 Yellow-breasted chat
 Yellow-headed blackbird
 Yellow rail
 Yellow-rumped warbler
 Audubon's warbler
 Myrtle warbler
 Yellow warbler

Total number of species = 154

Total number of species not previously detected = 11

*Species not previously documented at Wood River which were detected during mist netting and censusing conducted by Redwood Sciences Lab during the spring, summer, and fall of 1998.

Table 4. Bird species not previously detected at Wood River which were captured in 1998 through mist netting at Petric Dike during the breeding/post breeding and fall migration periods. Sampling was conducted by the Redwood Sciences Lab, Pacific Southwest Research, U.S. Forest Service.

Bird Species	Breeding/Post Breeding Season Detections	Fall Migration Season Detections
Brown creeper		X
Green-tailed towhee	X	
Olive-sided flycatcher	X	
Red-breasted sapsucker	X	X
Red-naped sapsucker	X	
Spotted towhee		X
Varied thrush		X
White-throated sparrow		X

VEGETATION

Data were collected from 29 vegetation monitoring plots on the Wood River Wetland property during 1997. This completed baseline monitoring for vegetation change in the interior wetland area of the Wood River Wetland. Therefore, no vegetation monitoring plots were sampled in 1998. Although 1998 was the first growing season of water levels managed for wetland restoration, significant changes in vegetation were qualitatively observed. Therefore, it is planned to sample all 29 vegetation monitoring plots during 1999 to more quantitatively describe the observed changes in the vegetation. This sampling frequency is earlier than the 3 to 5 year interval initially planned to occur after baseline data were collected.

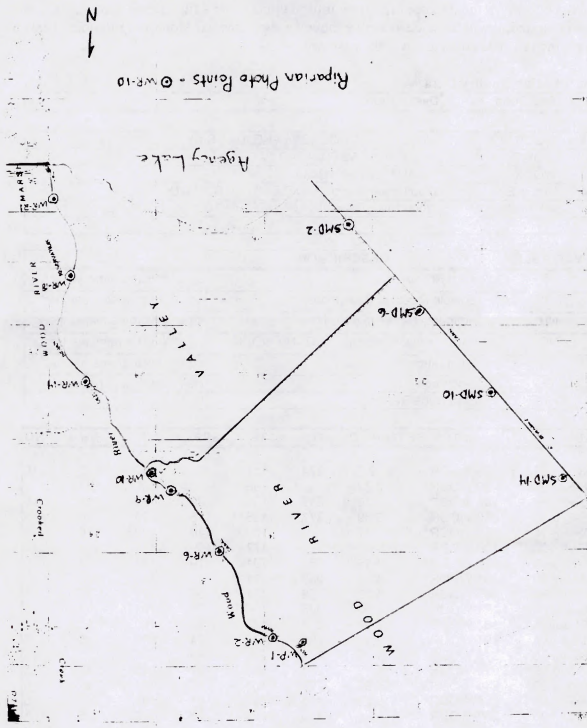
RIPARIAN RESOURCES

Photo Points

Photos were taken at the 11 established photo points along the Seven Mile dike and the Wood River (see Map 1). An additional photo point was added at the pond area in the northeast corner of the property. The riparian photo points are located approximately 1,000 meters apart. At each point four photos are taken (one in each of the four cardinal directions North, South, East, and West) using a compass to determine the direction. The photos are taken between the middle to end of June.

Photo points were first taken in 1995, the first year after livestock were removed from the property. A review of the photos, shows an obvious increase in the total amount of vegetation present in succeeding years. The 1995 photos show patches of bare ground that are no longer evident in the 1998 photos. Changes in the species composition are not immediately evident from the photos. These photo points will continue to be valuable as water levels and channel configurations are manipulated. Vegetation amounts and species composition will likely change with different moisture regimes.

Copies of the photos are located in the Wood River Photo Points binder located at Dana Eckard's desk in the Klamath Falls Field Office. These photos will be retaken in 1999.



Riparian Photo Points - WR-10

WATER QUALITY

The Klamath Tribes collected water quality data in 1996, 1997 and 1998. However, this data has not yet been analyzed and no conclusions have been drawn from it at this point. It is displayed here in raw form for the purpose of sharing information. When a final report summarizing the data is compiled, it will be made available through a supplemental Monitoring Report. Table 5 displays the raw data collected over the past three years.

Table 5 Water Quality Data

Site #	Site Code	Description
41	WODR	Wood River @ AGENCY LAKE (Dike Rd.)
42	WOWR	Wood River (WEED ROAD)
43	WODX	Wood River Dixon Road
44	WRRPE	Wood River Ranch PUMP EAST (INTO WOOD RIVER)
45	WRRPW	Wood River Ranch PUMP WEST (INTO 7-MILE CANAL)

VARIABLE	DESCRIPTION	UNITS
TP	Total Phosphorus	ug L ⁻¹ (micrograms per liter)
SRP	Soluble Reactive Phosphorus	ug L ⁻¹ (micrograms per liter)
NH	Ammonia Nitrogen (NH ₄ -N)	ug L ⁻¹ (micrograms per liter)
NO	Nitrate + Nitrite Nitrogen (NO ₃ -N + NO ₂ -N)	ug L ⁻¹ (micrograms per liter)
TN	Total Nitrogen	ug L ⁻¹ (micrograms per liter)
Q	Discharge	cfs (cubic feet per second)
STAFF	Staff Gage Reading	feet

DATE	JD	SITES	STAFF	Q	TP	SRP	TN	NH	NO	
03-Jan-96		3 WODR		2.3	374	117	92	280	30	16
08-Feb-96		39 WODR		2.72		166		395	31	
13-Feb-96		44 WODR		3.36	519	123	98	480	58	5
28-Feb-96		59 WODR		3.59	377	106	118	428	26	5
03-Apr-96		94 WODR		3.77		163	146	498	116	13
15-Apr-96		106 WODR				177	109	2730	130	17
08-May-96		129 WODR		4.15	352	151	119	134	5	5
20-May-96		141 WODR		4.38	549	124	115	165	23	12
03-Jun-96		155 WODR		4.19	359	121	97	127	37	5
19-Jun-96		171 WODR		3.55	388	107	99	181	33	5
01-Jul-96		183 WODR		2.99	228	103	83	190	13	5
15-Jul-96		197 WODR		2.42	205	100	24	50	5	5
29-Jul-96		211 WODR		1.79	301	112	95	236	5	5
13-Aug-96		226 WODR			273	107	87	215	46	5
28-Aug-96		241 WODR		1.69	299	104	79	104	17	5
24-Sep-96		268 WODR		0.22	455	87	81	183	43	5
09-Oct-96		283 WODR			409	104	85	132	25	5

DATE	JD	SITES	STAFF	Q	475	84	79	50	48	14
DATE	JD	SITES	STAFF	Q	TP	SRP	TN	NH	NO	
07-Nov-96	312	WODR	0.2		475	84	79	50	48	14
25-Nov-96	330	WODR	0.65		561	101	95	169	27	19
13-Dec-96	348	WODR				242	178	1030	69	39
03-Jan-97	3	WODR	3.35			90		230	23	
08-Jan-97	8	WODR	3.81			111	97	332	16	57
28-Jan-97	28	WODR	2.67	620		109	94	172	5	24
18-Feb-97	49	WODR	2.76	313		133	115	259	15	15
01-Apr-97	91	WODR	3.43	672		92	89	109	21	12
07-May-97	127	WODR	4.05	387		103	89	50	22	5
14-May-97	134	WODR	4.11	389		82	96	132	23	5
11-Jun-97	162	WODR	3.88	404		91	55	50	5	5
26-Jun-97	177	WODR	3.42	233		99	249	50	26	5
08-Jul-97	189	WODR	2.78	419		88	76	50	17	5
22-Jul-97	203	WODR	3.25	327		115	91	127	13	5
03-Sep-97	246	WODR	1.29	399		100		50	18	5
13-Oct-97	286	WODR	1.12	501		82	71	50	18	5
14-Jan-98	14	WODR				93		160		
02-Feb-98	33	WODR	2.8			110		268	5	
26-Feb-98	57	WODR	2.96			94		113	5	
10-Mar-98	69	WODR	3.1	467		104	97	195	5	15
24-Mar-98	83	WODR	3.83			92	70	344	20	16
07-Apr-98	97	WODR	3.7	666		97	84	119	22	5
21-Apr-98	111	WODR	3.81	519		107	83	149	16	5
09-Jun-98	160	WODR	4.19	479		98	80	130	5	5
23-Jun-98	174	WODR	4.19	317		101	76	132	5	5
09-Jul-98	190	WODR	3.95	370		100	71	160	5	5
21-Jul-98	202	WODR	3.45	292		115	81	196	5	5
11-Aug-98	223	WODR	2.4	243		99	76	140	28	5
26-Aug-98	238	WODR	1.75							
16-Sep-98	259	WODR	1.15	440		112	79	289	17	5
30-Sep-98	273	WODR	0.92			108	64	220	17	10
10-Oct-95	283	WODX	2.18	206						
07-Nov-95	311	WODX	2.2	208						
29-Nov-95	333	WODX	2.18	216						
08-Feb-96	39	WODX				80		114	22	
13-Feb-96	44	WODX	2.34	240		71	67	199	5	5
03-Jan-96	3	WOWR	9.59	403		83	47	184	28	18
08-Feb-96	39	WOWR				108		925	19	
13-Feb-96	44	WOWR	9.8	430		91	59	193	26	5
28-Feb-96	59	WOWR	9.58	373		67	67	244	17	13
03-Apr-96	94	WOWR	9.69			70	71	130	37	14
15-Apr-96	106	WOWR	9.75	365		76	55	136	19	12
08-May-96	129	WOWR	9.46	305		73	68	50	5	11
20-May-96	141	WOWR		484		70	60	36	5	18
03-Jun-96	155	WOWR	9.86	330		81	62	114	28	10
19-Jun-96	171	WOWR	9.47	275		79	71	141	32	5
01-Jul-96	183	WOWR	9.44	252		79	61	133	10	10
15-Jul-96	197	WOWR	9.39	246		87	67	50	5	12
29-Jul-96	211	WOWR	9.31	238		81	71	199	5	5
13-Aug-96	226	WOWR	9	231		82	68	117	5	5
28-Aug-96	241	WOWR	8.87	268		80	64	101	14	5

DATE	JD	SITES	STAFF	Q	TP	SRP	TN	NH	NO
25-Sep-96	269	WOWR	9.65	447	74	69	50	5	14
09-Oct-96	283	WOWR	9.46	377	78	74	85	5	12
07-Nov-96	312	WOWR	9.72	472	62	65	50	5	5
25-Nov-96	330	WOWR			88	74	168	23	19
13-Dec-96	348	WOWR			137	91	531	22	18
03-Jan-97	3	WOWR			70		155	12	
08-Jan-97	8	WOWR			72	71	115	5	30
27-Jan-97	27	WOWR		464	83	71	146	5	25
20-Feb-97	51	WOWR	10	500	76	78	156	5	5
01-Apr-97	91	WOWR	9.82	451	67	72	50	5	16
07-May-97	127	WOWR	9.36	324	80	70	50	11	5
14-May-97	134	WOWR	9.55	362	74	59	102	5	5
11-Jun-97	162	WOWR	9.75	363	84	52	50	5	5
25-Jun-97	176	WOWR	9.05	255	76	73	50	11	10
07-Jul-97	188	WOWR	9.18	270	90	72	124	17	10
22-Jul-97	203	WOWR	9.21	282	79	65	109	22	5
03-Sep-97	246	WOWR	9.62	339	88	62	50	7	10
13-Oct-97	286	WOWR		422	74	67	117	9	5
14-Jan-98	14	WOWR			81		129		
02-Feb-98	33	WOWR			83		227	5	
26-Feb-98	57	WOWR			79		50	5	
10-Mar-98	69	WOWR		429	74	75	50	5	20
24-Mar-98	83	WOWR			74	58	268	21	17
07-Apr-98	97	WOWR			79	67	92	16	5
21-Apr-98	111	WOWR		381	85	67	81	13	5
09-Jun-98	160	WOWR		358	84	63	129	5	5
23-Jun-98	174	WOWR		366	83	59	145	5	11
09-Jul-98	190	WOWR		336	91	61	170	5	5
21-Jul-98	202	WOWR	9.47	254	93	65	137	5	5
11-Aug-98	223	WOWR	9.1	217	83	68	121	14	5
26-Aug-98	238	WOWR	8.93	221	76	55	50	5	5
16-Sep-98	259	WOWR	9.55	305	80	69	116	18	11
30-Sep-98	273	WOWR	9.96		71	66	57	5	13
17-Aug-93	229	WRRPE			358	226	2360	94	18
05-Apr-94	95	WRRPE			1510	1170	3370	171	17
13-Apr-94	103	WRRPE			1620	1080	4470	773	23
31-May-94	151	WRRPE			233	131	1070	11	5
14-Jun-94	165	WRRPE			171		1370	35	
05-May-95	125	WRRPE			548		1210	222	
23-May-95	143	WRRPE			1220	970	2030	174	5
06-Jun-95	157	WRRPE			1570	1100	2290	170	31
21-Jun-95	172	WRRPE			1330	870	2690	86	64
05-Jul-95	186	WRRPE			1780	1370	3380	314	17
28-Feb-96	59	WRRPE			541	318	1990	50	5
15-Apr-96	106	WRRPE			2220	830	6130	2660	153
29-Aug-96	242	WRRPE			176	44	1570	175	5
07-Nov-96	312	WRRPE			230	167	1645	985	127
13-Dec-96	348	WRRPE			1060	318	5470	674	190
08-Jan-97	8	WRRPE			755	297	2140	264	172
28-Jan-97	28	WRRPE			707	467	2140	156	73

DATE	JD	SITES\$	STAFF	Q	TP	SRP	TN	NH	NO
18-Feb-97	49	WRRPE			800	806	3030	5	18
25-Jun-97	176	WRRPE			646	299	1610	663	40
25-Nov-91	329	WRRPW			68	31	531	5	5
25-Mar-93	84	WRRPW			628	360	2610	321	502
31-Mar-93	90	WRRPW			562	443	2190	35	10
06-Apr-93	96	WRRPW			676	378	2360	56	199
14-Apr-93	104	WRRPW			912	396	2180	5	13
20-Apr-93	110	WRRPW			566	82	1750	18	11
29-Apr-93	119	WRRPW			682		2180	36	
05-May-93	125	WRRPW			714	368	2580	37	12
13-May-93	133	WRRPW			1000	522	2240	36	5
18-May-93	138	WRRPW			1115	685	2380	118	19
26-May-93	146	WRRPW			1120	639	4100	592	5
05-Aug-93	217	WRRPW			243	221	1010	78	17
29-Mar-94	88	WRRPW			1400	1150	2950	154	18
05-Apr-94	95	WRRPW			1540	1280	3270	287	19
14-Jun-94	165	WRRPW			406		1120	88	
05-May-95	125	WRRPW			1020		4020	781	
08-May-95	128	WRRPW			902	762	2570	5	5
05-Jul-95	186	WRRPW			1600	1040	3610	368	15
28-Feb-96	59	WRRPW			873	512	2560	103	19
15-Apr-96	106	WRRPW			1310	466	6180	2260	138
13-Dec-96	348	WRRPW			798	236	4370	440	193
08-Jan-97	8	WRRPW			664	147	6680	314	172
28-Jan-97	28	WRRPW			551	480	2380	512	52

03-Jan-96	3	7MCA			207	540	58	534	48	24
08-Feb-96	39	7MCA				172		653	37	
13-Feb-96	44	7MCA			428	90	49	1780	52	5
28-Feb-96	59	7MCA								
08-May-96	129	7MCA			217	99	71	216	5	5
03-Jun-96	155	7MCA			110	116	66	244	57	5
01-Jul-96	183	7MCA			56	146	795	577	34	5
15-Jul-96	197	7MCA			163	373	202	746	359	62
29-Jul-96	211	7MCA								
28-Aug-96	241	7MCA			86	205	108	688	123	5
09-Oct-96	283	7MCA			83	118	79	261	51	5
06-Nov-96	311	7MCA			165	71	65	110	31	10
25-Nov-96	330	7MCA			219	119	95	485	65	40
13-Dec-96	348	7MCA				173	88	755	48	20
08-Jan-97	8	7MCA				84	70	652	30	53
27-Jan-97	27	7MCA			289	102	72	454	45	24
19-Feb-97	50	7MCA			173	94	62	519	30	16
02-Apr-97	92	7MCA			86	82	71	159	32	5
07-May-97	127	7MCA			169	97	71	157	52	5
14-May-97	134	7MCA			242	98	91	256	43	5
13-Jan-98	13	7MCA			258	96		484		
02-Feb-98	33	7MCA				105		514	24	
26-Feb-98	57	7MCA				95		363	48	
24-Mar-98	83	7MCA								

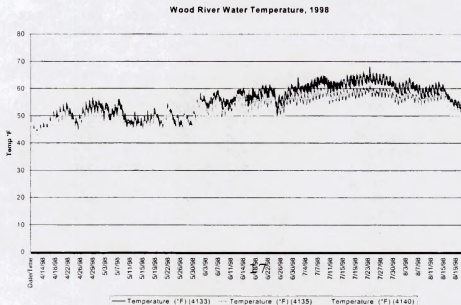
DATE	JD	SITES	STAFF	Q	TP	SRP	TN	NH	NO	
07-Apr-98		97	7MCA		194	128	63	535	81	5
21-Apr-98		111	7MCA		76	135	62	616	24	5
09-Jun-98		160	7MCA		171	142	83	319	11	5
23-Jun-98		174	7MCA							
09-Jul-98		190	7MCA							
26-Aug-98		238	7MCA		80	193	80	562	85	5
16-Sep-98		259	7MCA							
30-Sep-98		273	7MCA		92	67	256	39	5	

WATER TEMPERATURE MONITORING

Methods: Water temperature loggers (Onset Tidbit and Hobo-Temp) were deployed at three locations in the Wood River to record changes in water temperature over time. Instantaneous water temperatures are logged hourly for the duration of the monitoring period. Guidelines for calibration and deployment can be reviewed in "Klamath Falls Resource Area Waterbody Temperature Report, 1997" available at the Klamath Falls Resource Area office.

Results: Three water temperature data loggers were deployed within the channel restoration project reach. Temperature logger locations are: 1) North property line (approximately 3 miles upstream from the dike road bridge); 2) immediately downstream of confluence with Crooked Creek; 3) immediately downstream from dike road bridge.

Temperatures recorded between April and August showed the maximum water temperatures ranged between 55 and 65 degrees Fahrenheit for the three sites. During July, average warming through this reach was approximately 8 degrees from the upper station to the lower station. Water temperatures will again be monitored in 1999 and in 2000 to assess the effects of channel reconstruction on stream temperatures.



FISH POPULATION MONITORING

Introduction: This section of the report addresses fish monitoring and inventory relating to wetland and channel restoration. In general, there were three sampling categories:

Interior wetland. Fish populations within the interior wetland are samples with the objective of gathering baseline information on fish abundance and distribution as habitat changes over time.

Wood River larval and juvenile out-migration. Sampling was done with a shoreline orientated trap net and fishing with drift nets and Fyke nets off the Dike Road bridge. The objective is to gather baseline information on timing of early life stages and species presence of suckers and trout in the project area.

Channel Construction Salvage. Data presented here includes capture data from efforts to collect fish that would be harmed from channel construction activities. The goal was to collect and move all fish before dredging and filling (except fathead minnows) and move them into un-impacted areas of the Wood River.

Interior Wetland: Fish presence within the interior marsh was sampled by using a single ½ inch mesh trap net with a 100 foot lead extension. Traps were set for two nights each at two pond habitat sites between July 9, 1998 and August 6, 1998. The ponds were by removing borrow material for dike building in 1996 and 1997. The ponds are located near the northeast corner the property and near the Wood River pump station. Shoreline vegetation at these sites is relatively sparse consisting mostly of recently colonized willow, *Potamogeton*, aquatic smartweed and scattered bulrush. Average and maximum water depths were approximately three feet and five feet, respectively. Little or no emergent vegetation was noted and bottom substrate was a mixture of peat and pumice sand. Figure 1 represents the combined catch at both pond sites. All fish sampled, except the chub species are introduced species to the Klamath Basin.

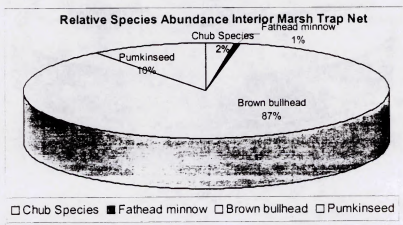


Figure 1.

A single water quality sample was taken with a multiprobe Hydrolab device at the pump pond trap site:

Date: 07/16/98
Temp: 34.25 degrees Celsius
Spec Cond: 283 us
pH: 7.46
Total Dissolved Solids: 0.181

Time: 1544
D.O. saturation: 60.1%
D.O.: 4.31 mg/l O
Sample depth: 0.4 m

Of particular note in this water quality sample was the extremely high water temperature of 96.65 degrees Fahrenheit.

Data collected on the interior ponds has significant limitations. For example, data represent an extremely small temporal and spatial sample. Additionally, there are gear limitations that include species and size specific trap avoidance. Since the trap is effective only for fish over 60 mm fork length, small species such as fathead minnow are likely under-represented. All brown bullhead captured were from a single trap set in the pump pond.

Wood River larval and juvenile out-migration. The larval trap net was used to monitor fish presence in the 1998 construction area and to obtain information on presence and timing of possible larval or juvenile out-migration. Unfortunately, no suckers or trout were sampled using this method. The trap was set in moving water sections of the existing west shoreline of the Wood River and within historic channel meanders before construction began. The trap, consisting of 1 mm nytex was set overnight on five occasions between July 15 and July 22, 1998.

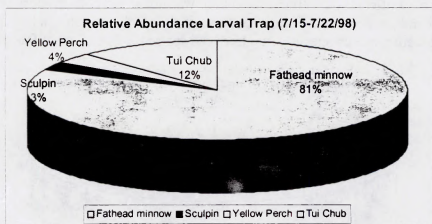


Figure 2.

Figure 2 is combined data from all trap nights. Fathead minnow was the most frequently captured fish for most trap locations. One possible significant gear bias is that schooling fish, such as juvenile fathead minnows, may

have been attracted to the trap as cover structure. Additionally, shoreline areas were generally low velocity and migrating juvenile trout and suckers may have been avoiding these areas.

Drift nets and a fyke net were deployed off the Dike road bridge on July 22 from approximately 7 PM to 8 PM. No fish were captured. On July 28, the same traps were deployed at two hour intervals from 6 PM to midnight. One redband trout (90 mm FL) and one juvenile sucker (Catostomidae) at 63 mm FL were captured in the large Fyke net.

Channel Construction Salvage. The objective of the fish salvage was to rescue fish just after areas were hydrologically isolated for dredging and filling operations. In 1998, this occurred in the upper two historic meander bends and in the adjacent existing Wood River channel (approximately 4 acres of aquatic habitat). The historic meander bends had much of the submergent and floating vegetation (primarily aquatic buttercup) manually removed one week prior to salvage activities. This activity, in combination with heavy boat traffic, may have displaced many of the fish prior to the salvage activity. Fish were captured by seining with 1/8 inch beech seines and two passes with backpack electroshockers. Fish were placed in containers and then moved to the Wood River below the construction site where fish were identified to species, measured, and released. Figure 3 represents the combined capture between 8/17/98 and 8/24/98.

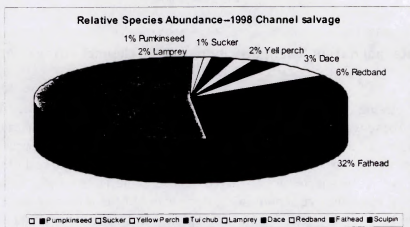


Figure 3.

Fathead minnows are under-represented in the sample due to an intentional effort to avoid capturing them while electroshocking. They were abundant in the warm water microhabitats among floating mats of aquatic *Ranunculus* in the historic meander bends, as well as the main channel. Additionally, sculpin are likely under-represented due to their escape by nosing into soft substrate. Three sculpin species were represented in the capture data. However, due to time constraints, no attempt was made to quantify relative abundance.

Sculpin species observed include the marbled sculpin (*Cottus klamathensis*), the Klamath Lake

sculpin (*Cottus princeps*), and the slender sculpin (*Cottus tenuis*). All lamprey (*Lampetra*) captured were ameoetes (larval form). No attempt was made to identify lamprey ameoetes to species. All suckers (4 total) were 1998 cohort (59-77 mm FL) and were identified as shortnose suckers (*Chasmistes brevirostris*). There is some degree of uncertainty in distinguishing between juvenile Klamath largescale suckers (*Catostomus snyderi*) and shortnose suckers. Redband trout were captured only in the historic meander bends. Figure 4 represents 50 mm size class distribution for redband trout.

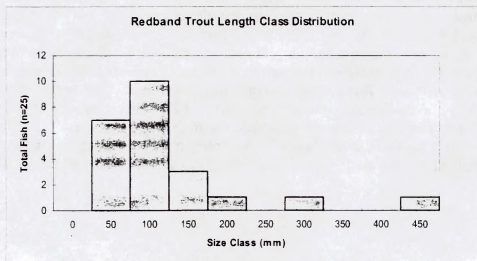


Figure 4. Redband trout length distribution, 1998 channel salvage (fork length in millimeters)

Snorkel survey. A single snorkel survey was conducted in the 1998 construction area on July 22, 1998. The purpose was to assess the need for fish salvage related to construction activity and to determine if snorkel surveys could be a viable project monitoring tool. Three snorkelers drifted downstream while attempting to stay equidistant from each other and the shoreline. Figure 5 represents relative species abundance observed in the 1998 project area. All redband trout were observed in a cohesive school in the deep water of the lower meander bend. Most of these trout ranged between 150 to 250 mm fork length. Only one brown trout (80 mm) and one lamprey were observed. No fish were observed in the main channel. Notable limitations to this survey included dense aquatic vegetation, deep water, turbidity, and high channel width.

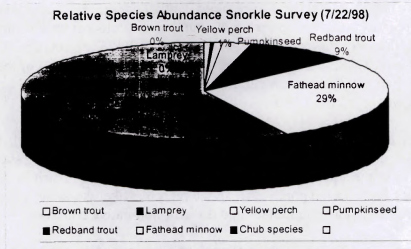


Figure 5.

SPOTTED FROG POPULATIONS

Surveys

Amphibian surveys, primarily focused on the Oregon spotted frog population, were conducted as part of an ongoing effort to monitor changes in population size and distribution as restoration of interior wetland habitat proceeds. Surveys were conducted on four different days between July 16 and August 8, 1998. A total of 50 spotted frogs were captured, measured, and released. An additional 56 spotted frogs were observed but not captured.

Spotted frogs were found only in areas known to have had strong breeding populations during past survey years. These include the entire length of the North Canal, the East canal along the Wood River, and the small channel just west of the East canal. Additional areas that were considered suitable habitat were surveyed, including several of the north/south running interior ditches. No spotted frogs were observed in these areas. Preliminary water quality measurements indicate that current spotted frog distribution may be limited by water quality in the interior marsh. Temperature and dissolved oxygen were measured at 8 microhabitats where spotted frogs were observed basking. Dissolved oxygen ranged from 7.27 mg/l to 10.36 mg/l. Temperature ranged from 19.6 to 27.09 degrees Celsius. Spotted frog density appeared to decrease in all cases as distance from the Wood River source increased. Spotted frogs were observed only in areas that receive varying amounts of perennial flow.

Of particular interest in this year's survey results was the apparent shift in previous size frequency distributions from a predominantly juvenile age structure to one dominated by adults and sub-adults (84% adult/sub-adult).

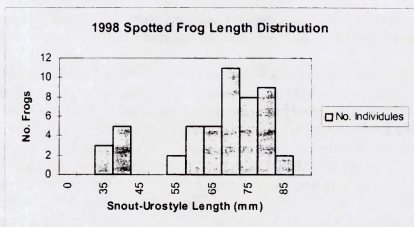
It should be noted, however, that there were significantly fewer juvenile spotted frogs observed in 1998 than in previous years whereas a similar number of adults per unit of survey effort were observed. During the 1997 survey 59 frogs were tagged with PIT tags. Of the 42 adult/sub-adults captured during 1998, four had been previously tagged. An analysis of these frogs movements from their 1997 location is currently being conducted. No new PIT (passive induced transponder) tags were placed in 1998.

If these areas develop the floating, submergent, and low emergent vegetation that favors adults Oregon spotted frogs, the population may be enhanced. However, predicting such an effect is risky because some of the aquatic structure may favor non-native fish (such as fathead minnow).

Keeping low water levels in the ponds early in the season is likely to favor recruitment of the Oregon spotted frog and other amphibians and disfavor non-native fishes.

Subsequent slow raising of water levels as the season advances will probably increase refuge area and food levels for more advanced life stages. While this scenario seems likely, it contains certain elements of unpredictability, so it should be viewed as experimental. In the latter context, some kind of monitoring should be implemented to determine the actual consequences of these manipulations.

Some amphibian species at Wood River are rarely observed (long-toed salamander western toad) either because their populations may be limited or they display erratic, unpredictable reproduction. It will be of special interest to determine whether pond creation and the water management favor these species in a manner in which they can be observed more frequently in a more predictable way. Table 9 and Figure 4 display size distributions and allow comparisons of species observations between years.



RECREATION

The Klamath Falls BLM conducted several different recreation monitoring efforts throughout 1998. Through monitoring, the BLM is continuing to gain valuable information about the types and levels of recreation use occurring on the wetland property.

As the recreation use pattern becomes better defined, so will the development of adequate and appropriate recreation facilities.

Recreational use was monitored and observed informally a fairly regular basis throughout the year by BLM employees visiting the wetland property. Additional monitoring occurred through the use of (and comments from) voluntary self-registration forms and more personal contacts with visitors. Based on these informal observations and other monitoring, some general conclusions from the 1998 recreation use season can be made:

- 1) Recreational use of the wetland increased during the 1998 waterfowl hunting season versus the 1997 hunting season. The opportunities for finding waterfowl and hunting success were much greater, as the former pasture lands within the wetland property provided good cover and open water for waterfowl.
- 2) Use of the property by non-hunters (fisherman, sightseers, wildlife viewers, hikers, etc.) continues to greatly exceed use by hunters.
- 3) Use of the area during the non-hunting season increased over the same period in 1997, but overall year-round use remains light (estimated to average five visitors per day).
- 4) Average group size remains small, probably less than three individuals per group.
- 5) Local residents (Agency Lake area) represent the largest visitor group using the property on regular basis.

Regarding recreational facility development, the area received substantial improvements in 1998. The entrance, parking, and staging areas were paved to reduce concerns regarding dust. A new vault type toilet, canoe and small boat launch, and parking area landscaping were installed. A one-half mile fully accessible trail was constructed from the parking area to the main wetland area. A contract was awarded to design and fabricate six interpretive display panels to orient visitors, interpret wildlife, wetland function, and other resources to visitors. The interpretive contract and trail work were partially funded with a wetland restoration grant received through the Klamath Falls Bureau of Reclamation.

These new facilities appear to receive good use and were almost universally praised by visitors contacted by the BLM.

Future improvements include an additional permanent restroom near the Wood River bridge, installation of the above mentioned interpretive displays, floating boardwalk levee crossings and complete planning for a wetland trail and environmental education site in 1999. Another contract for design and fabrication of approximately six additional interpretive displays will also be awarded. Some of this work will be funded by grant monies received from the U.S. Fish and Wildlife Service and the state of Oregon.

VISUAL RESOURCES

Wood River channel restoration, other wetland restoration efforts and recreation facility development continued in 1998. Informal monitoring of these surface disturbing activities showed greater short-term visual contrasts to the existing environment. As these areas are re-vegetated and the wetland areas re-established, it is fully expected that the visual resources should be greatly improved over the previous grazed pasture land area. It is also hoped that through additional landscaping, and cottonwood and willow plantings will further enhance visual resources. As stated in the Wood River RMP/EIS, the area's visual resources are to be managed for the long-term objectives of improving or providing positive effects to visual resources.

Dike building and other wetland restoration efforts continued in 1997. Informal monitoring of these surface-disturbing activities showed greater short-term visual contrasts to the existing environment. As these areas are re-vegetated and the wetland areas are re-established, visual resources are expected to be greatly improved over the previous grazed pasture land area.

Lands

Land Sales

When Congress authorized the Bureau of Land Management (BLM's) purchase of the Wood River property, it also instructed BLM to dispose of public lands in Klamath County to offset losses in property tax revenue that could occur from the acquisition. In 1998 the Klamath Falls Resource Area sold 1,600 acres of public land to the American Land Conservancy for the appraised fair market value of \$625,400. The American Land Conservancy subsequently sold the property to the Jeld-Wen corporation. The mineral estate (except for the oil, gas and geothermal resources) was also conveyed.

Lands Actions in Support of Restoration Efforts

Land surveys by the BLM Cadastral Surveyors are programmed for the summer of 1999. The surveys will identify private lands that need to be acquired to facilitate phase 3 of the Wood River restoration.

BLM and private landowners have verbally agreed to cooperate on phase 4 of the Wood River restoration.

CULTURAL RESOURCE MANAGEMENT

The BLM Cultural Resource Program provided supported various project activities at the Wood River Wetland in 1998. Activities centered on archaeological survey, cultural site protection, and consultation with the Klamath Tribes on cultural issues. Much time was expended to guide the management of cultural resources encountered during construction phases of the Wood River channel restoration project.

The National Historic Preservation Act, in addition to other laws and regulations, require that potential impacts to cultural resources be addressed prior to and during implementation of construction and various other projects. To assess potential project impacts, archaeological survey is often required. During 1998, two cultural resource surveys were conducted by a BLM Archaeologist in support of Wood River Restoration activities. One survey was conducted along the Wood River dike below the confluence of Crooked Creek within the area of Phase 1 and Phase 2 construction. The other survey, with assistance from a Cultural Site Protection Specialist of the Klamath Tribes, was conducted in the area of Phase 3 construction along the historic channel of the Wood River downstream from the Agency Lake dike bridge. This survey was performed under rather adverse conditions with dense marsh vegetation and much standing water. Another cultural resource survey, associated with a Watergate replacement, was performed at the northwest corner of the property.

Extensive cultural resource monitoring occurred during 1998 Wood River Restoration construction activities. Though archaeological sites had not been discovered during previous surveys conducted along the Wood River, it was anticipated that cultural resources would be encountered during restoration construction. An agreement had been signed between the Klamath Tribes and Oregon Trout to provide monitoring support and the protection of cultural sites. As anticipated, numerous sites were discovered during construction.

Four sites were encountered during Phase 1 and Phase 2 construction activities. Efforts were made to protect and isolate three of the smaller sites. The remaining site was quite extensive and required substantial recording and protection work. In part due to cultural concerns, project activity was suspended in this area during 1998. In conjunction with the Klamath Tribes and guidance from the Oregon State Historic Preservation Office, the BLM is preparing a cultural resource management plan for this site to ensure potential construction impacts are considered and mitigated during 1999 construction. In some areas, construction plans have been modified to minimize impacts to cultural resources. Many features of the river restoration project should serve to protect cultural resources from damage caused by fluvial erosion and unauthorized collection. Two additional archaeological sites were recorded within areas outside of project impacts.

Numerous meetings were held with Klamath Tribes staff and monitors to consult on various cultural resource issues as related to the Wood River Restoration project.

The BLM Archaeologist spent many field days at the Wood River Property working alongside Klamath Tribes monitors and staff to ensure cultural issues were addressed. Cultural resource management activities will continue at the Wood River Property in 1999. As indicated above, a cultural resource management plan is being developed to address concerns associated with a significant site encountered during 1998 construction. Measures will be implemented to mitigate potential damage to archaeological resources. The Klamath Tribes will continue to provide cultural resource monitors during restoration construction.