NORTHWEST MONTANA WETLAND MANAGEMENT DISTRICT

Kalispell, Montana

and

Moiese, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

U.S. Department of Interior

Fish & Wildlife Service

National Wildlife Refuge System

REVIEW AND APPROVALS

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Refuge Manager	Date 3-7-94	Project Leader	Date 3/11/94

Refuge Supervisor Review	Date 5/14/94
Regional Office Approval	Date 3/22/94

INTRODUCTION

Waterfowl Production Areas of the Northwest Montana Wetland Management District are located in Lake and Flathead Counties in northwestern Montana. The Wetland District is a satellite unit of the National Bison Range.

Lake County WPA's are located 3 to 9 miles north and northeast of the National Bison Range. The eight WPA units, Duck Haven, Herak, Kickinghorse, Montgomery, Sandsmark, Crow, Johnson 80, and Anderson total 3,063 acres. They are located in an area of glacial and lake bed soil deposits and are part of an area of dense glacial kettles which were formed during the Wisconsin period of glaciation. Lake County WPA's have been administered from the National Bison Range since the first acquisition in 1974.

Flathead County units total 4,458 acres and include Batavia, Flathead, Smith Lake, and Blasdel WPA's.

Flathead WPA (2,370 acres) consists of 7 miles of lake shoreline and upland along the north end of Flathead Lake, including remnants of "delta" islands at the mouth of the Flathead River.

Batavia and Smith Lake WPA's are located in the Smith Valley, 4 and 10 miles respectively, west-southwest of Kalispell. The 535-acre Blasdel WPA is located approximately 1½ miles north of Flathead Lake in what is known as the "lower valley" area of Flathead County.

Flathead County WPA's are administered as satellite units by the on-site Refuge Manager, who is headquartered at the Creston Fish and Wildlife Center, Creston, Montana (Section E.1).

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H. PUBLIC USE

A. HIGHLIGHTS

Flathead County

Total yearly precipitation resulted in the Flathead Valley recording its second-wettest year on record. (Section B). Little progress was made in wetland acquisition and enhancement under the two mitigation programs (Section C.1.).

Work continued on several Private Lands projects (Section F.2.).

Duck production increased 43 percent; Canada goose production decreased 45 percent, (Section G.3.).

Lake County

Work continued on the Five Valleys Wetland Conservation Project under the Prairie Pothole Joint Venture. A Preliminary Project Proposal on a pilot project for habitat protection in the Ninepipe area was submitted to the Washington Office (Section D.2.).

Breeding populations and nesting success of ducks decreased in the Ninepipe skunk removal area after reaching new highs in 1992, but were still much better than in non-control areas (Sections D.5. and G.3.).

The Partners for Wildlife Program continued, and 42 acres of wetlands, 477 acres of uplands and 6 acres of riparian habitat were restored/enhanced on private lands (Section G.2.).

A $60,000 Ducks Unlimited project completed at Crow WPA will increase a wetland complex in the southwest portion of the unit from 17 to 57 acres (Section G.2.).

B. CLIMATIC CONDITIONS

Flathead County

Variable monthly rainfall amounts, several recorded high temperatures, snow in June and a new record precipitation amount of 6.02 inches in July highlighted climatic conditions in Flathead County this year.

Total precipitation was 23.40 inches, nearly 7 inches above the 30-year-average. Above-average precipitation fell in 8 of the 12 months. A record 6.02 inches of precipitation fell in

July eclipsing the old one month mark of 4.78 inches, a record that had stood since December 1917. Rainfall in April, May, June and July accounted for 42 percent of the year's total precipitation. Most wetlands in the county were ice-free by April 1.

Temperatures were generally average throughout the year. The low for the year was -22° on January 13; the yearly high was a monthly record of 90° on May 12. The rainy weather in July also resulted in lower than average high monthly temperatures. The heavy precipitation resulted in flows being 27 percent above average in the three forks of the Flathead River, however runoff was not excessive. The rest of the year saw monthly temperatures remain normal until the latter part of November when a winter storm dumped 12 inches of snow in the upper valley area and temperatures plummeted to -14°. Weather conditions moderated in December, but a snowstorm on New Year's Eve brought .42 inches of additional precipitation making 1993 the second wettest on record. All wetlands froze on November 23. At year's end, Flathead Lake and other creeks in the county were ice-free; approximately 5 inches of snow remained on the ground.

Table I. 1993 Climatic Data, Flathead County WPA's*

MONTH	TEMPERATURE HIGH	TEMPERATURE LOW	PRECIPITATION (") 1993	PRECIPITATION (") 30-YR AVG.	SNOWFALL-1993 INCHES
January	41	-22	1.67	1.53	17.8
February	38	-21	.61	1.10	9.7
March	62	1	.62	1.02	2.5
April	65	27	2.20	1.10	.3
May	90	27	1.93	1.87	
June	86	34	3.46	2.21	
July	85	39	6.02	1.12	
August	86	31	1.49	1.40	
September	83	28	1.61	1.26	
October	73	20	1.01	.87	
November	53	-14	1.20	1.30	16.6
December	47	9	1.58	1.73	14.4
Totals			23.40	16.51	61.3

* Weather data for Flathead County WPA's is recorded at the National Weather Service Office at Glacier Park International Airport, Kalispell, Montana.

Weather conditions for Lake County WPA's were similar to those for the National Bison Range which can be found in that report.

C. LAND ACQUISITION

1. Fee Title

The importance of land acquisition/easements was demonstrated when we learned in April that a 20-unit sub-division (with a grass airstrip) was being considered in the lower valley area adjacent to Blasdel WPA. At year's end the airstrip had been developed and work was proceeding on several water wells. Further development of the area will presumably take place in 1994.

In December, a compatibility determination was completed on a proposed road easement on Smith Lake WPA. The easement request came from a California developer who was proposing a 290-acre development overlooking the WPA; the easement was required to meet county road regulations. We denied his request based on the compatibility issue. Other local landowners supported our findings and are also against this particular development.

The potential for acquisition/enhancement of wetlands within the district under the BPA and Kerr mitigation programs continued to be hampered this year despite much time spent in attending meetings and submitting enhancement project proposals. Continued bureaucratic foot-dragging by Advisory Board members, the introduction of unrelated mitigation proposals, and a reluctance by the State to actively meet waterfowl mitigation goals through wetland purchases or easements delayed any potential progress. In the late summer months, we were advised that the state was in the process of developing a new wetland mitigation plan which would include riparian areas as mitigation. Public involvement in this process is required, which will further delay any potential mitigation. It is hoped that we will see some positive action by the State in 1994. The entire BPA mitigative process continues to be frustrating and a perfect example of ineffectiveness and ineptitude on the part of the State. Despite the fact that we continue to receive calls from willing sellers and the approved mitigation plans call for acquisition/enhancement of over 4,000 acres of wetlands, the State has done nothing to effectively mitigate wetland losses caused by past hydro-electric development here in northwest Montana. Staff members of the Bison Range, Assistant Manager Washtak and ES personnel located at Creston continued attending various mitigation meetings and submitting project

proposals this year. As time goes on, we continue to see more and more development and loss of the wetland base in both Flathead and Lake Counties.

Acquisition/mitigation under the Kerr Dam mitigation plan also saw potential delays this year. In November, FERC (Federal Energy Regulatory Commission) released a draft evaluation of the erosion remedial action plan (on Flathead WPA) for agency comment. A no-action alternative was suggested; this would result in continued erosion of the WPA, as well as lack of other mitigative measures. All involved agencies (including Montana Power Company) have responded with strong disagreement to this alternative. As of late December, we were awaiting Secretarial action on FWS/Interior recommendations.

2. Easements

The primary development on the Lake County acquisition front was completion of a Preliminary Project Proposal for a habitat protection project centered on the excellent wetland complex in the vicinity surrounding Ninepipe NWR. The proposal was submitted to the Washington Office and is expected to rank high on the FWS request list for Land and Water Conservation Funds. The project would rely heavily on conservation easements from willing sellers to protect both wetlands and uplands in the area from subdivision. Efforts to garner public support for the project continued throughout the year, with a lot of support and very little opposition expressed. Among those endorsing the proposal were the Lake County Commissioners, CSKT Tribal Council and the Flathead Reservation Fish and Wildlife Advisory Board.

At year's end the language in the proposed easement document was nearly finalized. The initial easements will, hopefully, be taken in 1994 with Migratory Bird Fund money, and we are recommending that options be taken pending allocation of Land and Water Conservation Funds.

Figure 1. Lands bordering our WPA's are prime real estate. The typical new buyer is from out of state, wants land next to a wildlife area or other public land. They bring marauding dogs and cats, more barbed wire fence, septic lines into wetlands, weeds and land tracts that are too small for viable farm or ranch operations. The new houses they build make it impossible to restore the area back to wildlife habitat. All of this is up next to WPA's with nest densities approaching 1 per acre on uplands with 75 percent Mayfield success rates.

D. PLANNING

2. Management Plan

Planning included the preparation of the Preliminary Project Proposal for the Ninepipe Habitat Protection Project discussed above. The Environmental Assessment for this project is scheduled for completion in 1994.

4. Compliance with Environmental & Cultural Resource Mandates

In April, we received word that a cultural resource inventory would not be needed for the proposed land exchange on Smith Lake.

A station inspection in early July resurrected the issue of the Blasdel barn. The old barn (built in 1909) was part of the WPA acquisition in 1987. In 1988, the Montana SHPO determined the site eligible for nomination to the National Register of Historic Places based on architectural design. This summer Regional Office personnel called the barn an "attractive nuisance" declaring the barn was a safety hazard and potential liability problem; destruction of the structure was recommended.

A public meeting held in October led to a public outcry over disposition of the barn. Suggestions ranged from keeping the structure as is, renovating it, moving it or using the lumber for a community construction project. At year's end we were attempting to gather "committed" public involvement (dollar-wise) to see if renovation would be feasible; if not, the building may be taken down.

We continue to contact the Confederated Salish & Kootenai Tribes prior to wetland enhancement work on private lands on the Flathead Reservation. Their Shoreline Protection Division reviewed 77 wetland projects on 18 properties this year. Projects included ditch plugs and low level dikes that were proposed by the Montana Partners for Wildlife Office of FWS. All projects were approved. The Tribes "Aquatic Lands Conservation Ordinance" (ALCO) is similar to the U.S. Army Corps of Engineers' 404 permit process. For more information on wetland restorations see Section F.2.

5. Research and Investigations

Flathead County

Ecological Services personnel continued their study on Blasdel WPA this year. The purpose of the study is to evaluate the biological effectiveness of previously constructed habitat enhancements on the WPA's. The study is funded by the National Ecology Research Center (NERC) and involves investigation and monitoring of avian diversity on the WPA. This year the study indicated no significant difference in bird use between enhanced and natural wetland sites. The monitoring effort will continue in 1994. Upon completion of the study, which may continue for five years and involve enhancement construction, NERC hopes to be able to formulate an "enhancement guide" for the Flathead Valley.

Lake County

Ninepipe NR-87 - Nest Success of Upland Nesting Ducks in Relation to Predator Removal (61540-41) Tom Fondell, University of Montana.

This was the 8th year of study on Lake County wetlands in a 17-square-mile predator (skunk) removal area. Mr. Fondell's graduate studies are a follow-up to earlier studies by Nate Hall and Kurt Foreman. This long-term study was initiated after 3 years of data indicated Mayfield nest success was only 20.7 percent (1986-88). Predator removal was initiated in 1988 and has continued since. This was the last year of lethal skunk control for the study. The skunk catch has declined steadily, with 109 trapped in 1988, and only 10 caught this year. Passive control measures have included covering old culverts with bars, removing rock piles and old buildings, screening the base of old buildings and filling dens in irrigation ditch banks with cement. Outside the study area, 1993 skunk populations remained high at Pablo NWR and other areas of the Flathead Valley. Lethal control will be discontinued in the skunk control area, and monitoring will continue for the next few years to determine if passive measures will keep the skunk population down.

Three nest searches were conducted this year on 334 acres of managed cover and 170 acres of pasture in the skunk control area surrounding Ninepipe NWR. There were 86 acres of alfalfa and 111 acres of pasture searched at the Pablo National Wildlife Refuge, and another 55 acres of idle grassland searched at Sloan's Lake (in non-removal areas).
In the skunk removal area, 396 duck nests were found for a density of 0.5 nests per acre. Mayfield nest success was 42 percent for all species and 43 percent for mallards. This compared to 26 percent Mayfield for all species and 19 percent for mallards found in the non-removal comparison areas at Pablo and Sloan Lake, where 71 nests were found for a density of 0.28 nests per acre.

Searches for other species of ground nesting birds yielded a total of 182 nests of 13 different species on the 3 study areas. Sample size was not sufficient to allow comparisons of nest success between the removal and non-removal areas. Overall Mayfield nest success ranged from 9.5 percent for killdeer to 84.7 percent for common snipe. The most common nests found were those of short-eared owls at 42 nests and 55.4 Mayfield success, savannah sparrows with 24 nests and 17.7 percent Mayfield, meadowlarks at 23 nests and 20.1 percent, northern harriers at 15 nests and 27.9 percent and common snipe at 15 and 84.7 percent.

E. ADMINISTRATION

1. Personnel

All WMD personnel, with the exception of Assistant Manager Washtak and north valley seasonal employees, are headquartered at the National Bison Range. For a complete summary of personnel status and staff photo see the NBR Narrative.

Administration, operation, and maintenance of Lake County WPA's is the responsibility of personnel at the National Bison Range.

On-site management and administration of WPA's in Flathead County is the responsibility of the Assistant Manager, Ray Washtak (see below) who is headquartered at the Creston Fish and Wildlife Center. The Center is located approximately 15 miles east of Kalispell and 71 miles north of the Bison Range. The Fish and Wildlife Center is the only FWS facility in Flathead County. Several other FWS divisions, including Ecological Services, Fish and Wildlife Management Assistance, and Hatcheries are also headquartered at the Center. In 1993, there were a total of 13 full-time employees assigned to the various divisions.

Dean Vaughan, Private Lands Technician stationed at the National Bison Range, received a permanent appointment and promotion to GS-6 this year. Dean was also presented with a $500 Special Achievement Award for his outstanding work in promotion and completion of private lands projects.

Figure 2. Refuge Manager Jon Malcolm presented Private Lands Technician Dean Vaughan with a Special Achievement Award for his outstanding work in the Partners for Wildlife Program.

On April 18, Paul Gelhar EOD for his 4th year as a Biological Technician (Wildlife) to assist with WMD and refuge operations in Flathead County.

Figure 3. Biological Technician Paul Gelhar. This was Paul's fourth summer assisting with north valley WMD/Refuge operations. His previous experience included one summer as a Range Aid at CMR Refuge and seasonal experience with the Minnesota Department of Natural Resources.

Daily clerical support for the WMD operations in Flathead County is provided by the Administrative Support Assistant and Administrative Assistant at the Fish and Wildlife Center office. Office space and clerical assistance at Creston is provided on a cooperative reimbursable basis. The Office Assistant at the Bison Range provides budget tracking and other administrative assistance.

Figure 4. Sharol Birks, Administrative Support Assistant (on the right) and Sharon Hooley, Administrative Assistant offer much assistance to the WMD program in the north valley, as well as handling duties involving three other FWS divisions.

4. Volunteers

Rita Gelhar volunteered approximately 3 days assisting with fence repair, general sign maintenance and telephone answering responsibilities.

In January and February, members of Flathead Wildlife spent several days repairing and installing nesting material in goose structures on the WPA's in Flathead County; six additional structures were put out on Smith Lake and Batavia.

Volunteer Justin Paugh continued monitoring and maintenance of bluebird boxes on the local "bluebird trail" in Flathead County. Part of Justin's monitoring included the nest boxes along the boundary of Smith Lake and Batavia WPA (Section G.7.).

In February, Jake Tiesman volunteered 2 days helping with the construction and installation of goose nesting structures on Blasdel.

Figure 5. Local waterfowler and volunteer, Jake Tiesman helped put out these nesting structures on Blasdel WPA. Additional structures may be installed in 1994.

In August, the Flathead Chapter of the National Audubon Society volunteered 80 man-hours of pulling and digging purple loosestrife in Lake County wetlands.

5. Funding

Operational funding for the entire Wetland District is included in the annual appropriation of the National Bison Range Complex. Funding for WPA's in Flathead County and the Swan River NWR is broken down separately based on annual work plan requests submitted by the Assistant Manager at Creston. For FY 93, north valley O & M funding targets totalled $69,000. A preliminary amount of $73,000 has been targeted for FY 94.

Table II summarizes past funding for the north valley program.

Table II. Annual Appropriations, Flathead County WPA's and Swan River National Wildlife Refuge

FY	O & M	ADDITIONAL FUNDING
90	63,500	
91	65,100	$18,400 (Maint. 1262 funds)
92	69,200	
93	69,000	
94	73,000	

6. Safety

North Valley Refuge personnel attended safety meetings when conducted at the Fisheries Center.

In addition, annual step tests and L.E. physicals were completed. Washtak attended Aviation Safety Training. New body armor was received this year for L.E. related duties.

Staff members stationed at the National Bison Range attended routine safety meetings. See the Bison Range Narrative for details.

7. Technical Assistance

Ray Washtak and Paul Gelhar completed mourning dove surveys in Flathead and Lincoln Counties. As in past years, few doves were observed due to the usual very cool weather.

In May, Washtak assisted SCS with minimal effects determination on four wetland sites near Libby, Montana. Washtak also served as a science fair judge at the local elementary school in March.

Lynn Clark of the National Bison Range staff completed the St. Regis breeding bird survey in Sanders County and the mourning dove survey in Sanders County. Lynn also judged the Lake County 4-H Fair categories in wildlife, forestry, and entomology.

8. Other

Meetings and/or training attended this year included:

R. Washtak and B. West:
Coordination, planning, and advisory board meetings with BPA, FWS, MDFWP, Forest Service biologists and other special interest groups concerning BPA/Kerr mitigation. Compatibility training and annual work plan meetings; annual L.E. Re-certification, Marana, Arizona.

F. HABITAT MANAGEMENT

2. Wetlands

Flathead County

Despite near normal snow depths in surrounding mountain drainages, and normal temperatures during March and April, wetland water levels were generally below normal. Reed canary grass meadows on Smith Lake WPA were basically dry in the late spring months due to below average flows in Ashley Creek. Water levels on Blasdel WPA continued to be at an all time low. Only our recharge capabilities on Batavia kept that WPA from drying up. Rainfall in June and July totalled 9.48 inches, but offered little in the way of improving wetland conditions except on Smith. Warm fall weather and precipitation amounts near normal in the fall months left county wetlands below normal heading into the winter months. At year's end, snowpack in Montana's western mountain ranges was 12 to 40 percent below average, which may result in reduced wetland levels in early 1994.

Dean Vaughan, Private Lands Coordinator at the Bison Range continued investigating several wetland development opportunity's in Flathead County.

Lake County

Water conditions in Lake County wetlands improved somewhat in the spring, but run-off was still inadequate to refill many wetlands. The best news was that Crow Creek ran high much of the summer due to above normal rainfall, and water was diverted through a county road culvert on the north side of Duck Haven WPA. This water recharged four basins totalling about 25 acres on the WPA before spilling west and filling a

Figure 7. This 1-acre drained wetland (above) on private land in Lake County was restored (below) by installing a stop log riser on the drainage culvert passing under the irrigation canal in the background.

Wetland restoration/enhancement work on WPA's included a $60,000 Ducks Unlimited project at Crow WPA that will enhance 40 new wetland acres in four basins. Other work at Crow included filling 8-acre and 5-acre dry basins from irrigation canals, and subsequent pumping from the 8-acre basin to fill another 1-acre basin. Irrigation water was also used to recharge 20 acres of wetlands in several wetlands at Sandsmark and Johnson 80 WPA's.

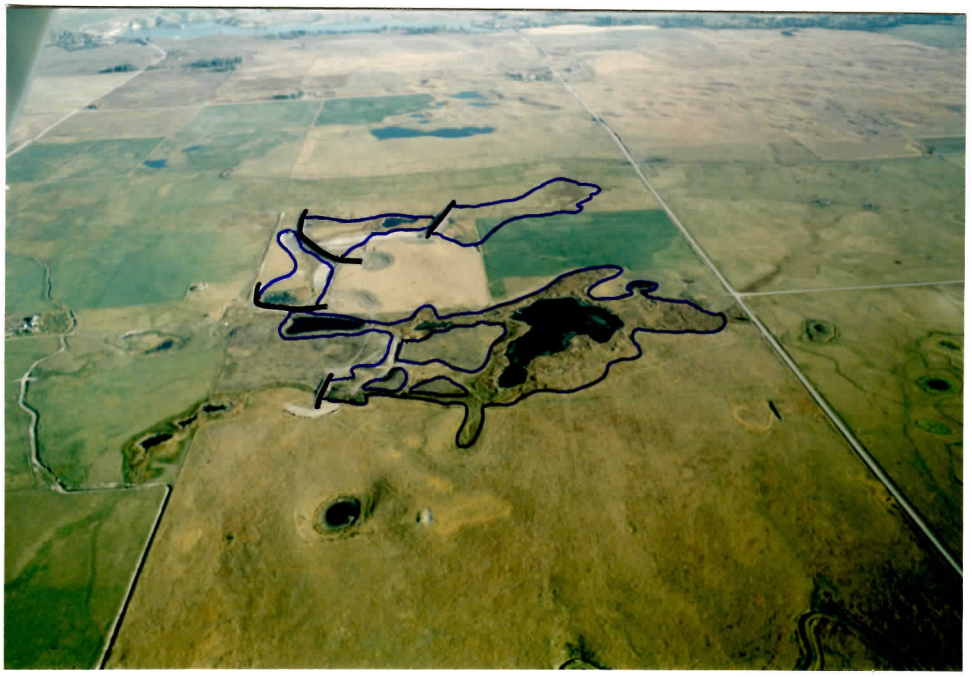

Figure 8. A Ducks Unlimited project completed at Crow WPA included construction of four dikes which will increase wetland acreage from 17 to 57 acres. Dikes are shown in black and full pool is outlined in blue.

Figure 9. This 8-acre basin at Crow WPA was filled from an irrigation canal, and water was later pumped from it to fill another 1-acre wetland.

4. Croplands

Barley plantings on Blasdel WPA were not rotated this year. In past years, 50 percent of the 60-acre field was planted to barley and 50 percent was fallowed to control weed growth. Our efforts were successful and the entire field was planted this year. Cooperative farming such as this is done on a 70-30 share with the cooperator harvesting 70 percent of the crop while the other 30 percent remains as a fall/winter food source. This year the fields were used by excellent numbers of waterfowl searching for waste grain. Cropping the entire field also resulted in "good PR" with local farmers who have complained about depredating waterfowl in their fields in past years.

Five acres of barley were also planted in Unit 8 on Blasdel. The entire field was left unharvested as an additional food source for wildlife.

In 1993, DNC growth in the north half of Unit 4 (Blasdel) was excellent (Figures 10 and 11).

Figure 10. The north half of Unit 4 on Blasdel was seeded to DNC in May 1992. By summer's end we had a reasonably "good catch", but Canada thistle remained a problem.

Figure 11. By mid-July of this year the seeding had "exploded" resulting in this excellent stand of sweet clover. An understory of alfalfa was also evident and should provide many years of quality nesting cover after the clover dies out.

In July, the four-row shelterbelt on Blasdel WPA was tilled and seeded to native grasses. In past years, we had a cooperator till the rows in an attempt to control Canada thistle growth. By planting the area we hope the grasses will eventually "out compete" future thistle growth even though we may have to mow the area for the next two years.

Farming on Lake County WPA's included four 20-acre grain plots at Crow WPA. Two plots were in half spring wheat and half winter wheat, one plot was in all spring wheat and the fourth was seeded to spring wheat and black medic. The black medic is an experiment at lea farming to help with weed control and provide a source of nitrogen. The medic will grow in 1994, and the field will be seeded to winter wheat in the fall. The plots were used well by pheasants and gray partridge, and there was some use by ducks, particularly on the plot adjacent to the DU wetland project.

5. Grasslands

Grassland units on Flathead County WPA's are dominated by reed canary grass, quack grass, Kentucky bluegrass, creeping meadow foxtail, bluebunch wheat grass, basin wild rye, rough fescue, fowl bluegrass, redtop, and DNC with a scattered overstory of rose and snowberry. All upland units are managed to promote optimum nesting opportunities. Management practices include rotational burning, haying, grazing, and control of noxious weeds. Vegetative growth, mulch buildup and subsequent applied management are monitored through photo points and Robel readings taken each spring and fall.

Lake County WPA grasslands are composed primarily of quackgrass, Kentucky bluegrass and DNC plantings. Several older DNC plantings have weed problems, with whitetop (Cardaria draba).

After recovering well in 1992, nesting cover in Lake County deteriorated slightly this year. This was noted in higher predation levels, likely due to avian predators, early in the nesting season. Cover improved later in the season and predation rates subsided. Portions of Sandsmark WPA continued to provide the best nesting cover in the county.

7. Grazing

In 1993, the permittee continued annual shoreline grazing of Unit 8 on Smith Lake, but at a reduced AUM rate. The purpose of the graze was to provide goose browse for broods hatched on the WPA. Approximately 8 AUM's were removed, which amounts to

a 60 percent reduction of AUM's from last year. Goose use of the shoreline was minimal this year possibly reflecting that a higher AUM rate is necessary to provide adequate goose browse.

In late April, permittee grazing of Unit 12 (Smith Lake) started (Figures 12 and 13).

Figure 12. Smith Lake, Unit 12 looking south prior to the graze. This unit had received no treatment since 1984 and mulch buildup was becoming excessive.

Figure 13. The same unit after the graze in early November. Total use was 91 AUM's; the unit probably should have been grazed "harder" to remove more of the mulch but the permittee did not have an adequate number of cattle. The unit will be monitored in 1994 to determine if additional grazing is needed.

In September, Unit 5 on Flathead WPA was grazed to provide goose browse; 82 AUM's were removed.

In Lake County, 80 acres were fall grazed at Duck Haven WPA as part of an Extension Agreement with an adjoining landowner. Under the arrangement, the cooperator uses each of three units for up to 160 AUM's of fall grazing once every third year. In exchange, the Service receives the use of 15 acres of private land where a wetland restoration project was done through the Partners for Wildlife Program.

At Crow WPA, 240 acres of grazing was provided the farming cooperator in return for his work in preparing and planting the wildlife food plots. Approximately 150 AUM's were provided on the northeast quarter section of the WPA, which is currently dominated by cheatgrass. Another 80 AUM's were used on the southeast 80 of the WPA.

8. Haying

Only one bid was received this year for the hay units surrounding Smith Lake. Extremely wet weather in July prevented the cooperator from adequately haying the units. Only 40 acres were hayed this year. The meadows are mowed annually in order to "open up the marsh" and provide additional pair habitat the following spring.

Approximately 30 acres of DNC were hayed on Flathead WPA (Unit 1) to stimulate the vegetation, remove the mulch buildup and control Canada thistle.

Haying on Lake County WPA's included 40 acres of alfalfa hayed at Johnson WPA which was provided in return for the cooperator's work in preparing and seeding the food plots mentioned above. Some 48 tons of first cutting was harvested by the cooperator, and he subsequently irrigated the field and left the second cutting standing for residual nesting cover in 1994.

9. Fire Management

Two prescribed burns were conducted on Flathead County WPA's this year. In mid-April, 35 acres in Unit 3N on Batavia were burned with assistance from personnel at NBR. The burn was conducted to provide goose browse and stimulate growth in decadent grasslands.

We also attempted to burn off the litter in Unit 4N on Blasdel; lack of vegetation prevented this from being a successful burn.

In April, a wildfire occurred on Smith Lake WPA in Unit 14. Approximately 15 acres of reed canary grass was burned. The fire was the result of an escaped burn from adjacent private lands. Smith Valley fire department responded and no damage to government property occurred.

There were no prescribed burns or wildfires on Lake County WPA's in 1993.

10. Pest Control

Flathead County

Canada thistle remained the most persistent and common noxious weed found on Flathead County WPA's. Infestations were widely scattered throughout the upland units making control difficult. Other noxious weeds include spotted knapweed and musk thistle. Knapweed infestations were found on Batavia, Blasdel, and Flathead. Musk thistle was present on upland units on Smith Lake and Batavia. In 1993, we spent 10 days spraying noxious weeds with the herbicide "Curtail". Force account efforts and cooperative work by the Weed Department using Curtail gave us excellent control over 70 percent of areas we spot sprayed. County Weed personnel spent an additional 3 days assisting our efforts.

Noxious weed control is also a goal of rotational haying within upland units. Haying allows for additional control over larger tracts and reduces our dependency on chemicals. We have found that two-to-three year rotational haying within DNC stands, which cannot be sprayed with 2,4-D based chemicals, is giving us excellent control with little weed regrowth.

Biological control efforts in Flathead County included continued monitoring of the thistle head weevil (Rynocyllus conicus). Approximately 800 of the weevils were released in 1978 on Batavia WPA. Excellent results continued in the uplands and the WPA now serves as a source of the weevil for transplantation to other musk thistle infested areas.

In July, we released 100 Canada thistle flowerhead weevils (Larinus planus) on Blasdel in Unit 5.

Figure 14. Bio-tech Paul Gelhar releases the thistle flowerhead weevil on Blasdel WPA. The unit will be monitored in 1994.

In 1993, we continued our assistance to County Weed personnel in locating purple loosestrife in Flathead County. State law has declared this plant a noxious weed and prohibits "propagation of any variety thereof...." Enforcement is the responsibility of the County. In September, we met with the supervisor of the Weed Department and owners of Gadiss Gardens, a local ornamental garden which had over 70 loosestrife plants. The owners insisted that "their" variety had been in the garden for 50 years, had never spread and was considered sterile. Tests were conducted at Montana State University to determine the virility of the seeds; approximately 40 percent of the seeds sprouted. Even with that information, the garden owners insisted there would be no problem. The County Weed Board voted for total eradication; this decision was appealed to the County Commissioners but the eradication order was upheld. After much discussion and more complaints by the owners they finally agreed to remove the plants in the spring of 1994. Currently, there are no known loosestrife infestations in any wetlands in Flathead County.

Efforts to control whitetop, Dalmation toadflax, Canada thistle and spotted knapweed continued on Lake County WPA's. Spraying treatments of weeds on Sandsmark, Crow and Kickinghorse WPA's are shown in the following table.

Table III. Herbicide use on Lake County WPA's in 1993.

WPA	Target Species	Herbicide	Rate*	Acres
Kickinghorse	Spotted Knapweed	Curtail	1 lb	49
Kickinghorse	Whitetop	2,4-D Ally	1 lb .12	20
Crow	Spotted Knapweed	2,4-D Ally	1 lb .27	43
Crow	Dalmation Toadflax	Tordon 22K	1 lb	30
Crow	Toadflax Knapweed Sulphur Cinquefoil	2,4-D Amine	2 lb	22
Sandsmark	Whitetop	2,4-D Ally	1 lb .36	57

*Pounds acid equivalent/acre

Although very little of the Lake County infestations were on Service lands, Bill West continued taking the lead on control efforts through the Lake County Purple Loosestrife Control District. Spraying with glyphosate continued as the primary method of control on approximately 129 sites throughout the County. Hand digging by volunteers was the method of choice on one site as reported in Section E.4. The control efforts were successful in halting the spread of this wetland weed pending the establishment of biological controls. Biological control efforts this year are discussed in the Ninepipe NWR Narrative Report.

11. Water Rights

Water rights for Batavia and Smith Lake WPA's were purchased by the FWS from the Ashley Irrigation District in 1981. At that time, $5,000 was paid to acquire 1,445 acre-feet of the waters of Ashley Creek; 745 acre-feet to be diverted for Batavia and 700 acre-feet for Smith Lake WPA. Montana statutes do not recognize a legal right to use water without an artificial diversion from the source; hence, the water right at Smith Lake provides for pumping from Ashley Creek. We did not exercise our right to pump this year because we do not have the means to pump out of the creek. In 1993, 319 acre-feet were diverted from Ashley Creek into the three marsh pools on Batavia WPA. Water was diverted to provide for pair and brood habitat. Deteriorated dikes within the WPA continued to cause water retention problems this year. The dikes are in a state of disrepair from age and extensive muskrat activity. Diverted water can be held within the marsh pools only by keeping the stoplogs in the main structure in Ashley Creek. This has the potential to interrupt rainbow trout movement in the creek. In addition, the City of Kalispell requires 15 cfs for proper dilution of sewage at their plant. Because of this, we have to recharge the WPA slowly while trying to maintain 15 cfs of overspill at the control structure. This year we recharged the marsh pools on three occasions.

The Fish and Wildlife Service is assessed a yearly fee for irrigation water and ditch maintenance by the Flathead Irrigation Project, regardless of the amount of water used. Water releases and diversions are made by personnel of the Project. This year's assessment totalled $15,300, or over $21 per acre of assessed land under the project. There are 716.89 acres assessed on FWS lands. Each acre was allotted .8 foot of water in 1993. However, only about 70 acre-feet of our allotment was used to recharge wetlands.

G. WILDLIFE

2. Endangered and Threatened Species

In 1993, bald eagles continued to use the WPA's in Flathead County as nesting and loafing sites. Bald eagles were observed on nearly every visit to Flathead WPA. In cooperation with the State, we again completed the bald eagle survey in July of this year. Survey results indicated that three eaglets were hatched and fledged on the WPA.

Use of the WPA by migrating and/or transient bald eagles also continued in 1993 with several other adults observed on numerous occasions. "Transient" eagles were often observed near the mouth of the Flathead River. These birds appeared to be using the "snags" along the WPA shoreline as occasional resting and loafing sites.

In Lake County, we again cooperated with the Confederated Salish and Kootenai Tribes and the Peregrine Fund by providing an open, treeless, grassland hack site free of great horned owls at Johnson WPA. Personnel of the Fund released 11 peregrines at the site in June. Site attendants reported two of the birds disappeared immediately, but the remainder were cared for until fall. Two birds also returned to the site from the 1992 hacking efforts, including a bird that disappeared early in 1992. An additional release is scheduled for 1994.

3. Waterfowl

Geese

The 1993 Canada goose aerial pair counts on Flathead County WPA's revealed a total of 104 pairs, an increase of 13 percent from 1992 figures. Brood counts conducted in early June indicated 220 goslings were produced on the four WPA's. This figure represents a 45 percent decrease from last year's estimates.

Figure 15. Canada geese continue to nest in a few of the old stumps on the delta island area of Flathead WPA. Continued erosion is eliminating these valuable nest sights. Only 2 stumps were occupied this year compared with 15-to-20 nests as little as 5 years ago.

Table IV. 1993 Canada Goose Production, Flathead County WPA's

WPA	No. of Pairs Observed	No. of Goslings Observed
Batavia	13	35
Smith Lake	34	75
Flathead	44	102*
Blasdel	13	8

* Estimated production; broods often move to the WPA from the Flathead River in search of loafing and feeding sites.

The valley-wide aerial census revealed 919 breeding pairs of Canada geese, down 8.6 percent from 1992. However, the number of pairs increased 25 percent when compared with the 12-year average. The valley-wide aerial brood count tallied 1,863 young, up 19 percent from last year.

In Flathead County, duck pair habitat was poor throughout the months of April and May, despite a 6 percent increase in average precipitation the first 5 months of the year. Lack of normal snowfall and runoff in the north end of the valley through April resulted in low water levels throughout the county. Aerial surveys in April indicated all permanent and semi-permanent basins were extremely low or dry. By early May, it was obvious that pair habitat would be lacking. Record rains in July came too late to improve wetland conditions. Poor habitat conditions resulted in a continued trend of decreased duck pairs; observed duck pairs this year decreased 6 percent from 1992.

Duck production on Flathead County WPA's was calculated using a hen productivity rate of .40, based on the nesting data from Lake county WPA's. Using this productivity rate, an average brood size of 5.1 and a brood survival rate of .7, estimated production for 1993 came to 661, a 43 percent increase from last year's estimates. The increase in production (despite decreased duck pairs) can be attributed to an increase in hen productivity and an increase in the average brood size.

Pair count data and production estimates for Flathead County units are summarized in Table V.

Table V. 1993 Duck Breeding Pair Counts and Estimated Production for Flathead County WPA's

Species	# Pairs	Production
*Flathead WPA		
Mallard	20	29
Gadwall	9	13
Pintail	2	3
BW/Cinnamon teal	11	16
Widgeon	3	4
Shoveler	2	3
Canvasback	2	3
Lesser scaup	4	6
Common goldeneye	2	3
Common merganser	8	11
* subtotal *	63	91
*Batavia WPA		
Mallard	32	46
Gadwall	1	1
Green-winged teal	1	1
BW/Cinnamon teal	30	43
Widgeon	6	9
Shoveler	10	14
Ring-necked	1	1
Ruddy duck	3	4
* subtotal *	84	119
*Smith Lake WPA		
Mallard	81	116
Gadwall	1	1
BW/Cinnamon teal	74	106
Widgeon	13	19
Shoveler	2	3
Redhead	51	73
Ring-necked	3	4
Canvasback	14	20
Lesser scaup	6	9
Common goldeneye	1	1
Common merganser	5	7
Wood duck	6	9
* subtotal *	257	368

Table V. 1993 Duck Breeding Pair Counts and Estimated Production for Flathead County WPA's (cont.)

Species	# Pairs	Production
*Blasdel WPA		
Mallard	11	16
Gadwall	7	10
BW/Cinnamon teal	11	16
Widgeon	1	1
Shoveler	10	14
Redhead	3	4
Lesser scaup	5	7
Common goldeneye	6	9
Ruddy duck	5	7
* subtotal *	59	84
*** Total ***	463	662

We continued to monitor waterfowl populations on all WPA's by aerial census flights and random ground counts done in conjunction with on-going work programs. Spring waterfowl populations on WPA's peaked in March when nearly 6,450 birds were observed.

Fall waterfowl populations peaked in late October when an estimated 12,750 ducks, geese, and swans were observed. The majority of these birds stayed in the area until late November when freeze-up occurred. However, hardy populations of mallards, Canada geese, scaup, redhead and tundra swans continued to use the Flathead River, the lakes northern shoreline and warm water sloughs throughout December. Total waterfowl-use-days for the district were estimated at 1,471,740, 35 percent below last year's estimates. Waterfowl population peaks are summarized in Tables VI and VII.

Table VI. Peak Waterfowl Populations, Spring Migrations

	1987	1988	1989	1990	1991	1992	1993
Swans	650	250	500	250	600	100	400
Canada Geese	500	750	600	250	1,200	1,150	1,500
Ducks *	4,935	7,480	5,200	18,300	9,350	6,045	4,550

Table VII. Peak Waterfowl Populations, Fall Migrations

	1987	1988	1989	1990	1991	1992	1993
Swans	115	140	125	350	250	150	300
Canada Geese	370	2,100	1,000	2,500	2,500	1,300	2,000
Ducks*	24,466	21,900	20,300	34,550	24,575	20,550	10,450

*Coot numbers are included.

The mid-winter waterfowl census was done for Flathead County and Swan River on January 14, and revealed 1,600 ducks (1,230 mallards), 550 Canada geese and 308 tundra swans. The Mission and lower Flathead River area was flown on January 15, with just over 22,000 ducks (21,000 mallards), 1,250 Canada geese and 20 tundra swans recorded.

Duck breeding pair counts on Lake County WPA's revealed a 21 percent decrease in breeding pairs, with 575 pairs counted compared to 726 pairs in 1992. Part of the recorded decrease may have been due to the count being somewhat late

in the season. Mallards comprised 35 percent of the breeding pairs, with cinnamon teal making up 15 percent, gadwall 15 percent and redheads comprised 9 percent. Nest monitoring as part of long-term studies by Montana Cooperative Wildlife Research Unit indicated a Mayfield nest success of 42 percent in the skunk removal area in the Ninepipe vicinity. This was down from the average of 64 percent recorded in 1992. Avian predation during the early part of the nesting season was a major reason for the decline.

Estimated duck production for Lake County WPA's was calculated using a hen productivity rate of .56 based on nest success from nest monitoring on a portion of the WPA's. An average brood size of 4.0 was derived from the brood index counts, and we used an estimated .70 survival from the count average to flight stage. Estimated production of 902 ducks was only 43 percent of that estimated in the banner year of 1992.

Table VIII. 1993 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's

Species	# Pairs	Production
*Montgomery WPA		
Mallard	13	20
Shoveler	10	16
Gadwall	5	8
Cinnamon teal	3	5
Redhead	17	27
Blue-winged teal	1	2
Widgeon	3	5
Lesser Scaup	2	3
Ruddy Duck	2	3
Ring-necked duck	1	2
Common merganser	3	5
* subtotal *	60	96

Table VIII. 1993 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's (cont.)

Species	# Pairs	Production
*Kickinghorse WPA		
Mallard	16	25
Gadwall	20	31
Cinnamon teal	18	28
Blue-winged teal	5	8
Green-winged teal	2	3
Shoveler	15	24
Widgeon	5	8
Redhead	2	3
Lesser scaup	5	8
* subtotal *	88	138
*Herak WPA		
Mallard	12	19
Cinnamon teal	12	19
Shoveler	8	13
Gadwall	10	16
Redhead	4	6
Green-winged teal	2	3
Ruddy duck	2	3
Widgeon	2	3
Pintail	3	5
* subtotal *	55	87
*Crow WPA		
Mallard	24	38
Gadwall	16	25
Cinnamon teal	15	24
Blue-winged teal	6	9
Shoveler	24	38
Widgeon	4	6
Pintail	1	2
subtotal	90	142

Table VIII. 1993 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's (cont.)

Species	# Pairs	Production
*Johnson 80 WPA		
Mallard	5	8
Cinnamon teal	1	2
Shoveler	3	5
Gadwall	6	9
Redhead	6	9
Widgeon	3	5
subtotal	24	38
*Sandsmark WPA		
Mallard	36	56
Pintail	3	5
Gadwall	26	41
Shoveler	33	52
Cinnamon teal	28	44
Blue-winged teal	6	9
Green-winged Teal	1	2
Redhead	18	28
Widgeon	5	8
* subtotal *	156	245
*Duck Haven WPA		
Mallard	14	19
Redhead	20	31
Shoveler	20	31
Cinnamon teal	17	27
Gadwall	19	30
Widgeon	2	3
Green-winged teal	3	5
Ruddy duck	7	11
* subtotal *	102	157
*** total ***	575	903

In December, an outbreak of acute aspergillosis occurred in the wintering population of ducks on the Flathead River and at a warm water slough just west of the National Bison Range. Refuge personnel picked up 112 duck carcasses, and the loss likely was several times that. We submitted five specimens to the Madison Wildlife Health Lab, where acute aspergillosis from moldy corn was confirmed as the cause of death. The outbreak subsided when cattle were turned into cornfields in the Moiese Valley, and apparently cleaned up the piles of moldy corn. This was the second such outbreak of the disease in that area in recent years.

4. Marsh and Water Birds

American bitterns, great blue herons, pied-billed grebes, eared grebes, and sora rails utilized the WPA's in Flathead County this year. Populations were monitored in conjunction with on-going field activities. Populations appeared to peak in mid-August.

Two pairs of sandhill cranes were observed again on Batavia WPA in April. In past years, the cranes have nested; however we observed no "colts" this year on the WPA. We also observed about 20 cranes on Smith Lake throughout the spring and early summer months. Two cranes were observed adjacent to Flathead WPA during the Audubon Christmas bird count in mid-December.

Birds in this category observed during duck pair counts on Lake County WPA's included 5 double-crested cormorants, 2 great blue herons, 1 American bittern, 1 red-necked grebe, 5 horned grebes and 50 coots.

5. Shorebirds, Gulls, Terns & Allied Species

Bird species in this group that were observed again this year on Flathead County WPA's included spotted sandpipers, lesser yellow-legs, Wilson's phalaropes, dowitchers, snipe, avocets, ring-billed, and California gulls. Long stretches of open shoreline on Flathead WPA attract hundreds of gulls each year. This year, approximately 3,000 ring-billed gulls were observed in early August. Several hundred California gulls were also observed on every trip to Smith Lake.

In Lake County, birds of this category counted during the duck pair counts included 1 American avocet, 8 common snipes, 2 killdeer, 14 Wilson's phalaropes and 12 black terns.

6. Raptors

Raptors that were common to Flathead County WPA's included: northern goshawk, northern harrier, red-tailed hawk, rough-legged hawk, Swainson's hawks, osprey, golden eagle, bald eagle, great horned owl, short-eared owl, and kestrel. Nesting of short-eared owls and northern harriers has been documented in past years. A peregrine falcon was observed in the Creston area in July.

The first osprey sighting of the year in Flathead County was on April 1. Warm, spring-like weather was likely a factor in the early sighting. Flathead WPA continues to attract a number of these birds each year. The birds generally arrive in early spring from their wintering grounds in Central America and Mexico. The WPA offers ideal nesting conditions, with many cottonwood snags and tree stumps located in the delta area and lake shoreline used as nest sites each year. Access to the lake provides an easy fish base for the birds. In 1993, there were 19 nests on the WPA; production was estimated at approximately 48 young.

Raptors recorded during duck pair counts on Lake County WPA's included 16 short-eared owls, 3 red-tailed hawks, 1 rough-legged hawk, and 8 northern harriers.

7. Other Migratory Birds

Washtak and Gelhar completed two mourning dove coo-count surveys again this year. The surveys were run in Flathead and Lincoln Counties. No doves were observed this year due to very cool weather conditions.

Justin Paugh continued his voluntary monitoring of the nesting boxes at Smith Lake and Batavia this year. Justin reported 6 boxes were occupied and 11 bluebirds and 22 swallows were fledged. Marion Kelly also monitored a bluebird trail in the same area; her report indicated that 27 bluebirds were fledged on her route. Bluebirds were first observed in the valley on March 30; they departed the area in late August.

There were six common ravens seen during duck pair counts on Lake County WPA's.

8. Game Mammals

Whitetail deer are the most common big game animal observed on Flathead County WPA's each year. Aspen, willow, and cottonwood groves, as well as brushy areas on Batavia, Flathead, and Blasdel, continue to provide year-round habitat; sightings of does and fawns were common this year. Dense cattail stands along the shoreline of Flathead WPA also provided excellent winter habitat. Mountainous, forested units on Smith have been designated by the State as winter range for the whitetails. Exact populations using the WPA's are unknown, but may be as high as 100 to 150 animals.

9. Other Resident Wildlife

Random observations indicated pheasant populations in Flathead County were down again this year. However, crow counts conducted by State biologists in the "lower valley" area continued to show a relatively stable population in the area.

The pheasant population was also down from last year in Lake County.

11. Fishery Resources

As in past years, Smith Lake WPA continued to support an excellent population of yellow perch. The State of Montana is responsible for management of the fishery resource in the lake; no management was applied this year as the resource continues to be self-sustaining.

15. Animal Control

In 1993, the refuge office at Creston continued to receive several complaints from "lower valley" landowners concerning depredating waterfowl. These complaints usually involve no more than a 100 to 200 geese which generally disperse from the croplands after a few days. However, in order to satisfy the concerned parties, complaints are turned over to Animal Damage Control personnel in Stevensville, Montana even though it may be as long as a week before they can respond.

Predator control activities in Lake County are covered in Section D.5.

16. Marking and Banding

Sandsmark WPA was among the banding sites in a cooperative effort with Montana Cooperative Research Unit, Montana Department FWP and Confederated Salish and Kootenai Tribes in banding a western Montana quota of 400 mallards. A total of 530 ducks, including 382 mallards, were banded. Immature birds comprised about 50 percent of the total.

Figure 16. Joe Ball, Leader of the MT Cooperative Wildlife Research Unit and Sue Ball, CSKT Wildlife Biologist were among the cooperators in the duck banding project again this year. Here, they are checking a trap at Sandsmark WPA.

Since recent banding began in 1991, the Banding Office has advised us of 30 returns. There were 19 returns, or 63 percent from the local vicinity, seven returns or 23 percent from California, two returns from Idaho and one from Oregon.

H. PUBLIC USE

1. General

Public use activities on Flathead County WPA's include pheasant hunting, waterfowl hunting, fishing, trapping, bird watching, deer hunting, and occasional cross-country skiing. The high population base in and around the city of Kalispell results in a high, sustained use of the areas. The northern part of the Flathead Valley "has been discovered" and the Kalispell area continues to attract hundreds of new residents each year. As a result, both consumptive and non-consumptive uses will probably increase each year. State fishery biologists estimate fishing visits on Smith Lake alone account for over 8,000 visits each year.

7. Other Interpretive Programs

Blasdel WPA was included in the local Audubon Club's annual "Christmas Bird Count Zone". Mild weather and a light snow cover contributed to an observed count of 153 species. Several raptor species, warblers and wrens were observed on the WPA again this year.

8. Hunting

Flathead County

The 1993 duck and goose season opened on October 3. Car counts on all areas remained near last year's figures and success was only fair due to bluebird weather. Flathead and Smith Lake received the most pressure. In contrast to past years, hunters in private pit blinds adjacent to and immediately north of Flathead WPA again bagged very few geese on opening day. Success improved as the season went on; freeze-up during the third week in November pushed the birds to the Flathead River. Hunters who had access to the river or to private stubble fields continued to do well until the season closed on January 9.

In 1993, Montana Department of FWP split the duck season into 3 openers in response to hunter preference for extended late season hunting opportunities. Duck season opened on October 2 then closed on the 17th.

This year's drought left the majority of north valley potholes dry and hunting pressure was limited to the more permanent basins, the Flathead River, and the lake's shoreline areas. Blasdel WPA received very little hunter use after the opener because of low water levels. The season opened again on November 2. Continued warm and dry weather in early November did little to improve hunting conditions; weather fronts were lacking and the few rain showers we did receive did not move any significant numbers of birds to help hunter success. Heavy snow and freezing conditions in late November essentially ended the season before the November closing date. The season opened again on the 18th of December however hunting was restricted to the river and/or warm water soughs in the county. Duck season closed for the year on January 3; hunt visits were estimated at 750, a 35 percent decline from 1992.

The 1993 pheasant season opened on October 16. Pheasant hunting was poor in the north end of the valley; poor success could be attributed to very wet weather in July which seemed to greatly impact brood survival. The most popular hunting area in Flathead County is the "lower valley" area south of Kalispell. This area is dominated by agricultural practices and includes both Flathead and Blasdel WPA's. Hunter use of the 2 units was down an estimated 55 percent compared to previous years. Blasdel WPA received the majority of use, with 17 cars counted in the parking lots at daylight on opening day (down from 20 in 1992). By noon only two birds had been checked. Poor hunter success, a lack of birds and corresponding big game seasons the following week contributed to the decline in pheasant hunting activity this year.

Deer hunters continued their use of Flathead WPA this year. The WPA lies within a State designated whitetail doe hunting district and up to three doe tags could be purchased for either archery or rifle season. Because of this, the WPA remains a popular deer hunting area. Hunter visits were estimated at nearly the same as in 1992 (125). Several reports of harvested deer were received, but were not documented by refuge personnel.

In Lake County, hunting pressure was generally light during the duck and goose seasons, and hunter success was fair. Hunting pressure was heavy for the pheasant season opener, and slowed to light but sustained activity thereafter.

9. Fishing

As in past years, Smith Lake WPA continued as one of the most popular fishing spots for yellow perch in northwest Montana. The WPA received heavy use throughout the winter and summer months. The Montana Department of FWP has estimated annual fishing visits at over 8,000. Success varied with the time of the year. In 1993, March and August proved to be the "hot" months, with the size of perch ranging from 6-to-10 inches.

10. Trapping

Trapping is permitted on all WPA's in accordance with State regulations. Flathead, Batavia and Smith Lake generally receive the most pressure. Muskrats are the most abundant furbearer. When inquiries are received about trapping the WPA's, individuals are asked to voluntarily report their success, however no one called in this year.

17. Law Enforcement

Assistant Manager Washtak conducted all patrol work in Flathead County again this year. As in past years, L.E. efforts were concentrated primarily on patrolling the WPA's during the waterfowl and pheasant seasons, investigating vehicle trespass on the lake's shoreline and pursuing reports of stray dogs harassing waterfowl. In 1993, Assistant Manager Washtak assisted the County Animal Wardens with stray dog problems on and around Batavia WPA. Stray dogs have been a problem for years on the WPA and the situation was getting out of hand. Since we had no enforcement authority off the WPA and we could not always be there to observe the activity on the unit; County Animal Wardens assisted with patrol and land owner contacts. The situation escalated when a large rottweiler killed a neighbor's poodle and the case ended up in court. As a result, other landowners started to complain about continued stray dog activity on the WPA, both the wardens and I responded by suggesting that these owners get rid of their dogs before more trouble arose. This seemed to work in several cases as owners got rid of the main problem-causing dogs.

On several occasions, State Wardens assisted with patrol of the WPA's. Their assistance resulted in several citations for late shooting. While hunting in November near the Hatchery Complex, Washtak observed a case where a disgruntled landowner fired several shots from a .22 at a

group of deer hunters; the sheriff was contacted for assistance. However, the individuals declined to press charges.

In Lake County the law enforcement program centered around hunting season openers for ducks, geese and pheasants. All three openers occurred during the month of October. Park Ranger Tony Pinelli and Refuge Officers Lynn Clark and Bill West conducted patrol on or near the eight WPA's, Ninepipe NWR, Pablo NWR and associated State, Tribal and private lands. These patrols were coordinated with State Warden Rick Schoening and two Tribal Wardens.

Only one citation was written by refuge officers and that was for a dog at large on Duck Haven WPA. This was the same animal responsible for killing 20 ducks on the WPA in 1992. The owner had two previous warnings. The fine was $50. The owner was aghast that his dog could not hunt on the WPA. He didn't seem to understand that the dog had to be accompanied by a human.

Two cases turned over to the State Warden resulted in State citations. These included an early shooter on opening day of pheasant season and hunting pheasants out of the back of a moving pickup. Incidents handled without a citation included a neighboring rancher coming onto Crow WPA and removing 400 yards of dirt from the irrigation canal spoil pile without contacting the Refuge Manager. Mr. Frank McCready thought he had permission from the Flathead Irrigation Project to use the dirt to fix an irrigation ditch problem on his land. He didn't think he needed to talk to us. The matter was solved by requiring Mr. McCready to reseed the area and fix the fence. A similar trespass occurred when Mr. Ron Curry and his wife, Betty White, directed five cement trucks, a well drilling rig and a semi loaded with building materials to drive across Crow WPA to access his new home building site. They didn't have an adequate bridge across the irrigation canal to carry this large equipment so they used the WPA as an alternate route, right past a peregrine hack tower. After some heated discussions, the matter was settled when Mr. Curry agreed to build 120 feet of new fence where they had driven.

I. EQUIPMENT AND FACILITIES

1. New Construction

In late August, we added a 425 square foot addition to the shop/storage building at Creston (Figure 17 and 18).

Figure 17. Photo is of the back portion of refuges' shop building before the addition.

Figure 18. The addition was added on (force account) for about $800.00 and greatly improved our storage capabilities at the hatchery complex.

2. Rehabilitation

Approximately 25 man-days were spent this year repairing boundary fences, H-braces and wire gates on Smith Lake, Batavia, Blasdel and Flathead WPA's.

In late December, we received word of a vehicle accident at Smith Lake which caused damage to our barb-wire boundary fence. The Highway Patrol provided us with information and contact with the individual's insurance company resulted in restitution for the damage. As payment, we accepted $250.00 worth of steel in-line posts to be used on another project next year; we still have to repair the damage, but we saved some money in the way of needed fence materials. This was the first time we were able to get restitution; cases like this in past years were impossible to track down because the accidents were never reported to the Sheriff or Highway Patrol.

Bio-tech Gelhar spent about 20 days inspecting boundary fence lines and making repairs where needed. About one-half of a mile of fence was replaced on Smith Lake and Batavia.

In July, the old rotted bridge crossing Ashley Creek on Batavia was removed. The boards and pilings were burned in October.

4. Equipment Utilization and Replacement

After much experimentation this summer we finally got the new 60 hp Volkswagen engine on the airboat to operate properly. The boat now planes out and runs well.

NBR crews assisted with swapping the 250 gallon Bean slip-in sprayer for a newer 200 gallon Wajax slip-in unit. The unit was installed on the Dodge crew-cab. A headache rack was also installed on the fire rig for safety purposes.

J. OTHER ITEMS

Jon Malcolm continued to serve as FWS alternate on the Flathead Fish and Wildlife Advisory Board, and filled in for Ron Skates at most meetings. Board members are from the Confederated Salish and Kootenai Tribes, Montana Department of Fish, Wildlife and Parks, and the USFWS. The members work together in establishing hunting and fishing regulations for non-tribal members on the Flathead Indian Reservation.

4. Credits

Ray Washtak wrote the draft of all sections for Flathead County. Jon Malcolm edited the report and wrote all Lake County sections except for H.17., which was written by Bill West. Sharon Hooley and Sharol Birks of the Fish and Wildlife Center at Creston did the final proofing, word processing, printing and assembly.

K. FEEDBACK

Flathead County

In February, an adjacent landowner at Smith Lake proposed a land exchange involving 20 to 30 acres of reed canary habitat for similar land which would be more suitable for his ranching operation. Included in the trade would be an upland area that would be developed into a parking lot and access lane for the south side of the WPA. After discussion with the landowner the proposal was written up twice for R.O. approval, (it got lost the first time). At year's end, nothing had been done because the second proposal was also "misplaced". In December, the proposal was re-submitted a third time for consideration. However, we have heard nothing as to the status of this proposed trade. Meanwhile, the landowner is still waiting and is getting frustrated with trying to work with the government. Delays such as this not only give field personnel a bad image but also delay what are often "good deals" for the resource. With land prices at a premium and development on an up-swing in the Flathead Valley, even small tracts such as this are important resource acquisitions; the realty business in western Montana needs more careful scrutiny or we, as a resource agency stand to lose much. The regional office needs to pay attention to our realty requests. It is hoped the land trade will go through in 1994 (if the owner is still interested).

For other feedback, see the National Bison Range report.

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

U.S. Department of Interior
FISH AND WILDLIFE SERVICE

NATIONAL WILDLIFE REFUGE SYSTEM

REVIEW AND APPROVALS

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1993

Refuge Manager — Date 3/22/94

Project Leader — Date 3/22/94

Refuge Supervisor Review — Date 3/22/94

Regional Office Approval — Date 3/27/94

INTRODUCTION

The Swan River National Wildlife Refuge is located in northwest Montana, 38 miles southeast of the town of Creston, in the serene and picturesque Swan Valley Mountain Range. The Refuge was established in 1973 at the request of Montana Senator Lee Metcalf, who desired to see the area preserved. The Refuge was established under authority of the Migratory Bird Conservation Act. It consists of 1,568 acres, with an additional 210-acre Forest Service inholding that is managed under a Memorandum of Understanding. The refuge boundary lies within the floodplain of the Swan River above Swan Lake and between the Swan Mountain Range to the east and the Mission Mountain Range to the west. The valley was formed when glacial water poured down the steep slopes of the Mission Range into Flathead Lake. The valley floor is generally flat, but rises steeply to adjacent forested mountain sides. Approximately 80 percent of the refuge lies within this valley floodplain, which is composed mainly of reed canary grass. Deciduous and coniferous forests comprise the remaining 20 percent. Swan River, which once meandered through the floodplain, has been forced to the west side of the refuge by deposits of silt, leaving a series of oxbow sloughs within the refuge floodplain.

The purpose of the refuge is "...for use as an inviolate sanctuary, or for any other management purpose, for migratory birds". Objectives of the refuge are to provide for waterfowl habitat and production and to provide for other migratory bird habitat. The refuge also provides a nesting site for a pair of southern bald eagles and a variety of other avian species. In addition, deer, elk, moose, beaver, bobcat, black bear and grizzly bears are known to inhabit the area. There are no significant developments or facilities on the refuge and present management is directed at maintaining the area in its natural state. The refuge is a satellite unit of the National Bison Range. Day-to-day administration and operations are the responsibility of the on-site Refuge Manager located at Creston, Montana, 38 miles northwest of the refuge.

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A. HIGHLIGHTS

Very warm spring temperatures and average precipitation resulted in extensive, early flooding of the refuge (Section F.2.).

Estimated duck production decreased 22 percent; Canada goose production increased 278 percent (Section G.3.).

The bald eagle pair again hatched and successfully fledged one eaglet (Section G.2.).

Snowfall on the valley floor was below average, (Section B.).

B. CLIMATIC CONDITIONS

In 1993, total snowfall amounted to only 53.5", resulting in a third straight year of record low snowfall. However, total precipitation was 27.84", 5 percent above the 12-year average. High temperatures in the 60's in early April resulted in an early mountain snowmelt resulting in a rapid runoff and subsequent flooding of the refuge. A record high of 91 in May contributed to even more runoff and by early May the refuge was 90 percent+ flooded.

Warm temperatures prevailed throughout the summer months. Precipitation in June totalled 5.51", 278 percent above the monthly 12-year-average, however precipitation for the remaining 6 months was 6 percent below average. Precipitation for the year totalled 27.84". Temperatures were near normal for the remainder of the year.

November brought the year's first major snowfall when 11" fell on the 22nd. Temperatures plummeted to as low as -11 during the week, resulting in freezing of all interior potholes and sloughs. By year's end Swan Lake remained ice free except for small sheltered bays; approximately 23" of snow remained on the refuge.

Climatic data for the refuge is provided by Adolf Kopp Jr. who lives in the town of Swan Lake adjacent to the refuge. Adolf is under contract with the National Oceanic and Atmospheric Administration and voluntarily supplies the data listed in Table I.

Table I. 1993 Climatic Data, Swan River National Wildlife Refuge

MONTH	TEMPERATURE		PRECIPITATION (INCHES)		SNOWFALL
	HIGH	LOW	1993	12-YR AV.	1993
January	47°	- 4°	3.04"	3.12"	20.5"
February	47°	9°	1.72"	2.54"	9.5"
March	64°	18°	0"	2.06"	.0"
April	79°	31°	1.48"	1.49"	.0"
May	84°	27°	2.51"	2.41"	.0"
June	88°	30°	4.17"	1.98"	.0"
July	89°	39°	3.67"	1.57"	.0"
August	94°	29°	1.15"	1.62"	.0"
September	81°	27°	1.95"	1.59"	.0"
October	82°	21°	1.92"	1.76"	.0"
November	48°	3°	1.76"	2.98"	11.0"
December	46°	1°	2.72"	3.48"	17.5"
			27.84"	26.60"	53.5"

C. LAND ACQUISITION

1. Fee Title

There was no land acquisition in 1993. Several meetings concerning the BPA/KERR mitigation process were held again this year. The two mitigation programs continued to be bogged down in bureaucratic red tape and it will be surprising if any acquisition takes place in the near future. Refer to the Wetland District Narrative for specific information concerning the status of the two mitigation programs.

D. PLANNING

5. Research and Investigations

In early January, a special use permit was issued to researchers from the Yellow Bay Biological Station (Yellow Bay, Montana) for installation of a weather data collecting station on the refuge.

Figure 1. This weather data collecting station will be used in conjunction with a study of nutrient loading and sediment bio-availability in Swan Lake and its tributaries. No other aspect of the study is directly related to any refuge lands. RW 1/93

E. ADMINISTRATION

The Swan River NWR is a satellite unit of the National Bison Range (NBR) and is manned by the Refuge Manager located at the Creston Fish and Wildlife Center. Refuge activities such as budgeting, detailed administrative and operational functions are coordinated with the Project Leader at the Range. Day-to-day administrative functions are aided by the administrative clerks located at the Creston Fish and Wildlife Center. Refer to the Wetland District Narrative for administrative details.

1. Personnel

In February, Asst. Manager Washtak along with other Region 6 Firearms Instructors, received a group performance award for extended duties involving the annual in-service training.

Bio-tech Paul Gelhar returned on April 18 for his fourth summer.

4. Volunteer Programs

In May, two students from Flathead Valley Community College volunteered 2 days assisting with refuge activities, Figure 2.

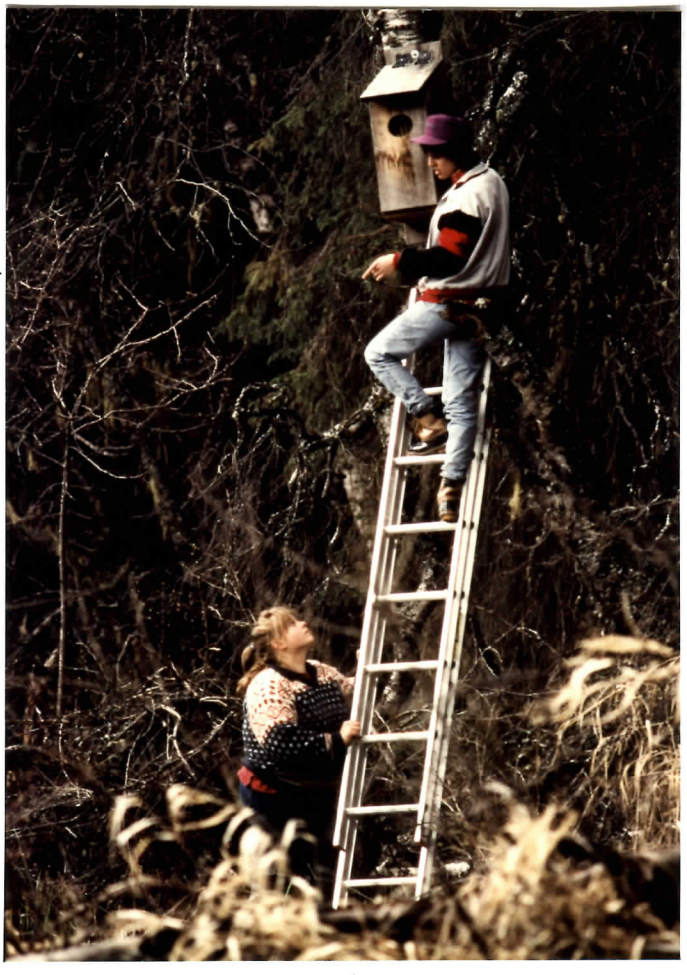

Figure 2. Both volunteers assisted with inspection, repair, and maintenance of wood duck boxes on the refuge. The students were enrolled in varied conservation oriented classes and were required to have "hands-on" experience to satisfy course requirements. PG 5/93

During the summer months, Ellie Jones, a resident of Swan Lake and an Audubon member voluntarily kept the newly installed refuge information box supplied with refuge maps, FWS brochures and bird lists, (Sec. H.6.). Amy and Jennifer Washtak volunteered 4 days in copying the bird lists on heavy colored paper (supplied by the Audubon Society) and then properly folding the lists for use. By working with these volunteers, we saved a considerable amount of money in this cooperative effort and easily got the job done.

6. Safety

When safety meetings were held by the hatchery staff Refuge personnel attended.

In addition, step tests, and annual L.E. physicals were completed. Washtak attended Aviation Safety training; new body armor was received for L.E. related duties.

F. HABITAT MANAGEMENT

2. Wetlands

Approximately 1,254 acres of the refuge are classified as a wetland/grassland complex. All of this acreage lies within an "alluvial floodplain" adjacent to the south end of Swan Lake. Vegetation is composed primarily of dense stands of reed canary grass.

With the exception of a culvert under Bog Road in Spring Creek and a staff gauge within the creek, which has been used for recording water flow levels, no other water control facilities or developments exist on the refuge.

Approximately 90 percent of the refuge flooded this year. Flooding generally occurs in May and June when mountain snowpack begins to melt. However, warm temperatures in March, April and May resulted in extensive, early flooding this year, Figure 3.

Figure 3. A view of the early flooding taken from the parking lot adjacent to "Bog Road". The flood waters were deep enough to allow for motor boat use; this was the first time in nine years that we could actually motor nearly anywhere throughout the refuge.

Flood waters enter the refuge through the principal tributaries of Swan River, Bond Creek, Yew Creek, and Spring Creek. Water flows started to enter the refuge in late March and continued into mid-July this year. The refuge did not "dry out" until early September. Annual flooding has not affected growth of the large stands of monotypic reed canary grass as successional wetland vegetation has not appeared over the years.

3. Forests

Forested areas comprise approximately 313 acres of the refuge. Wooded tracts lie primarily on the west, south and southeastern portions of the refuge. Major tree species include old growth fir, spruce, cedar, and larch. All forested units are maintained in their natural state.

7. Grazing

There was no grazing on the refuge this year due to the wet soil conditions. The lack of interior cross fences and a suitable permittee(s) limits our use of this management tool.

8. Haying

There was no haying on the refuge this year, despite further attempts to locate permittees. Continued wet, boggy soil conditions over all of the proposed hay units contributed to the lack of interest. Haying has been used in the past in an effort to "open up" the dense stands of reed canary grass, thus providing additional pair and brood habitat.

10. Pest Control

Canada thistle is the most persistent noxious weed found on the refuge. Infestations are generally limited to elevated upland sites and the nesting islands located in the northwest portion of the refuge. High water again limited our access for planned control purposes. Control was limited to pulling or hand chopping any plants that had "bolted" on the nesting islands.

G. WILDLIFE

2. Endangered Species

The Swan/Mission Mountain Ranges have been designated as a "habitat corridor" of the threatened grizzly bear. The Montana Department of Fish, Wildlife, and Parks (MDFWP) continued their study this year to determine the status of the grizzly in the northern end of this range. No formal studies were made on the refuge, but an overflight of the area in October revealed the presence of a 2-year old, radio-collared boar near the west end of Bog Road adjacent to the river. This was the first documented sighting of a grizzly on the refuge in nine years.

The nesting pair of bald eagles were sighted on the refuge in early February. One eaglet was fledged in mid-May. The pair and its young were observed utilizing the refuge and the surrounding area on several occasions, presumably feeding on waterfowl, fish, and rodents. In cooperation with State monitoring efforts, we again recorded our

periodic observations of the eagles and submitted the annual state bald eagle nesting forms.

On several other occasions during the year, "transient" eagles were observed on the refuge. These birds spent varying lengths of time on, in or near the refuge, then presumably moved to other locations within the Swan Valley. In late April, two additional adults and four immature eagles were observed south of Bog Road roosting in old snag trees.

3. Waterfowl

Despite excellent wetland conditions, observed duck pairs decreased 21 percent from 1992 (Table II).

Table II. Pair Count Data 1988 - 1993

SPECIES	1988	1989	1990	1991	1992	1993
Mallard	50	54	39	66	110	71
Cinnamon/BW teal	29	31	19	26	24	21
Common goldeneye	19	30	0	25	28	24
Wood duck	0	3	5	10	5	5
Common merganser	3	8	2	0	3	0
Widgeon	0	3	0	2	2	1
Pintail	0	3	0	1	0	0
Ring-necked duck	4	1	6	1	5	5
Barrows goldeneye	0	0	0	0	0	0
Shoveler	2	3	0	2	0	4
Bufflehead	0	0	11	1	0	4
Green-winged teal	3	0	0	0	0	0
Gadwall	0	1	0	0	0	2
Lesser scaup		4	0	5	0	2
Hooded merganser			3	1	0	0
Total	110	141	85	140	177	139

1993 duck production figures were calculated using a hen productivity rate of .40, based on nest searches conducted on Lake County WPA's. Using this productivity rate, an average brood size of 5.1, and a brood survival rate of .7, estimated production for 1993 came to 198, a 22 percent decrease from 1992 production estimates (Table III).

Table III. Estimated Duck Production, 1985-1993 Swan River National Wildlife Refuge

	1985	1986	1987	1988	1989	1990	1991	1992	1993
Ducks	244	150	172	91	147	39	175	256	198

The reason for the decrease in production can be directly attributed to a decrease in the number of observed pairs and a decreased hen productivity rate.

As in past years, waterfowl population estimates were based on aerial census flights and random ground counts made in conjunction with on-going work activities. Peak populations are listed in Tables IV and V. Total waterfowl use-days this year were estimated at 198,300, a 55 percent increase from CY 92 estimates.

Table IV. Peak Waterfowl Populations, Spring Migrations Swan River National Wildlife Refuge

	1985	1986	1987	1988	1989	1990	1991	1992	1993
Swans	0	16	100	136	180	150	100	10	125
Canada geese	223	75	150	150	205	400	150	140	250
Ducks	920	367	215	535	2595	1650	5600	500	1465

Table V. Peak Waterfowl Populations, Fall Migrations
Swan River National Wildlife Refuge

	1985	1986	1987	1988	1989	1990	1991	1992	1993
Swans	10	10	35	36	*55	150	250	25	50
Canada geese	40	175	175	275	150	350	200	200	200
Ducks	440	847	495	1086	550	2235	2550	340	1945

*Observed in December

Canada goose production estimates are based on aerial pair counts done in April, followed by aerial brood counts in early June. Documenting actual nesting on the refuge is difficult due to high water levels and general inaccessibility of the refuge. No nesting in elevated structures was observed.

Canada goose production estimates are listed in Table VI. These figures may or may not represent actual production on the refuge. As in previous years, broods hatched within the Swan River/Lake system often migrate to the refuge in search of food, loafing sites, or for safety. Figures listed in Table VI reflect observations made on the day of the aerial survey and do not necessarily reflect actual refuge production. However, these aerial counts, conducted since the mid-70's, are our most accurate index of goose production in the Swan Lake/Refuge system.

In 1993, there was an apparent decrease of 24 percent in the number of observed pairs; however, production increased by an estimated 226 percent. The reason for this increase in production is unknown. It may be attributed to several factors; we did not observe all goose pairs on the day of the flight and there may have been a general increase in nesting success within the refuge/river/lake system resulting in increased use of the refuge by goslings.

Table VI. Swan River NWR, Canada Goose Breeding Pairs and Estimated Production

	1985	1986	1987	1988	1989	1990	1991	1992	1993
Breeding Pairs	15	40	32	25	34	42	23	38	29
Number of Young Observed	94	67	38	77	45	84	32	26	85

In 1993, we continued our voluntary monitoring efforts with the Swan Lake Chapter of the Audubon Society in an attempt to locate loon nests on the refuge. Several loon calls were heard again in May. Two loons were observed on the lake in early June about one-half mile north of the refuge's lake boundary. No nests were observed on the refuge this year.

4. Marsh and Water Birds

Annual flooding of the refuge in the late spring and early summer months provided excellent marsh habitat for soras, pied-billed grebes, red-necked and horned grebes, American bitterns, great blue herons, and many other species of marsh and water birds. Populations peaked during the mid-summer months; as cooler weather set in during the fall this group of birds readily departed for warmer climates. Nesting probably occurred on the refuge this year, but was not documented.

5. Shorebirds, Gulls, Terns & Allied Species

Species utilizing the refuge again this year included California and ring-billed gulls, black tern, Wilson's phalarope, common snipe, American avocet, killdeer, and several species of sandpipers. Populations again peaked in July and August; use-days were estimated at 18,050, a 5 percent decrease over 1992 estimates.

6. Raptors

Coniferous and deciduous forest areas on the refuge continued to offer excellent resting and loafing sites for many raptor species. Northern harriers, Swainson's hawks, red-tailed hawks, and great-horned owls were commonly observed on nearly every visit to the refuge this year. Nesting has occurred in the past but was not documented this year.

8. Game Mammals

The refuge provides excellent year-round habitat for many of the big game mammals found in the State of Montana. Deer tracks were commonly seen in most upland areas on the refuge; elk tracks have been observed in February and March along Bog Road; a young cow moose was observed feeding in a pothole during the September aerial census. In 1993, white-tailed deer were the most commonly observed species. Resident populations were estimated at 30-35. Fawning probably occurred, but was not documented.

10. Other Resident Wildlife

Coyotes, beaver, muskrat, and raccoons are known to inhabit the refuge. Observations are generally made near the river and on backwater sloughs within the refuge. Coyotes, beaver and muskrat were observed this year.

In 1993, we did not observe any increase in new beaver activity along the Swan River. Prolific beaver activity along the shoreline of Swan River in past years resulted in destruction of many old growth cottonwood trees. The reason for the decline in activity is unknown, but may be attributed to a continued cyclic decline in the beaver population. Illegal trapping may also have an impact on the population, but this has not been documented.

11. Fisheries Resources

Game fish common to Swan River and the Lake include yellow perch, bull trout, northern pike, kokanee salmon, largemouth bass, cutthroat, brook trout, and mountain whitefish.

As in past years, densely vegetated areas of Spring Creek, which empties into Swan Lake on the northeast corner of the refuge, provided excellent pike spawning habitat. During the May waterfowl pair counts when water levels were extremely high, we observed many large "swirls" within the creek and interior borrow ditches indicating continued use

of the area by spawning females. The Creek was closed to fishermen as part of the annual refuge closure from March 1 through July 1 (Section H.1.).

H. PUBLIC USE

1. General

Despite the refuge's generally secluded, out-of-the-way location, annual flooding and lack of established interpretive foot trails, non-consumptive public use of the refuge increased this year. We have no accurate way of determining actual use, but based on random "car counts", discussions with the "locals" and demand for the refuge leaflets (Sec. H.6.), we may have had as many as 5,000 non-consumptive visits this year. The reason for the suspected increase may be attributed to the wildlife viewing signs which were installed along Highway 83 a few years ago and our new refuge information box. Whenever visits to the refuge were made for on-going work programs, we usually observed several vehicles parked in the parking lot.

6. Interpretive Exhibits/Demonstrations

In May, we installed a small "refuge information box" adjacent to the parking lot on Bog Road, Figure 4.

Figure 4. Based on demand for the brochures and bird lists that were put out, this refuge information box was well used by the public. Volunteer Ellie Jones estimated she put out about 3500 "leaflets". This small display has given us a new perspective on use of the refuge by the visiting public. RW 5/93.

8. Hunting

Approximately 40 percent of the refuge is open to waterfowl hunting. Big game and upland game bird hunting is prohibited. The majority of the waterfowl hunt area is located north of Bog Road and along portions of Swan River. Steel shot is required.

This year's duck season was split with three separate openers. Duck season opened October 2nd, closed on the 17th, opened again on November 2nd, closed on the 28th and finally re-opened December 18th; the season remained opened until January 2nd.

Several parties were out for the initial opener and had constructed temporary blinds along the lake's shoreline, Figure 5.

Figure 5. Success was fair to good on opening day, as many birds decoyed easily. These hunters had just about bagged their limits when contacted; however, bluebird weather on opening day did keep overall success down somewhat from last year. RW 10/93

Mild weather continued for the remainder of the month and into the first 3 weeks of November resulting in moderate hunter use. Freeze-up on November 23 pushed remaining birds to open portions of the river and lake. Hunter activity trailed off during December due to cold, freezing conditions.

Goose season also opened October 2 but ran continuously into 1994 with a closing date of January 9. Goose hunting by those hunters on the refuge was usually combined with their duck hunting efforts. No geese were checked in the bag this year. However, several reports of goose hunting success were received on various occasions throughout the season.

Hunter visits this year were estimated at 320, a 28 percent increase over last year's estimates.

9. Fishing

Fishing activity on the refuge is limited to Spring Creek after the closure period. High water levels again limited fishing visits in the river and success was poor. By late summer, when flood waters did recede in the river, activity did pick up but success was limited.

The most popular fishing spot on Swan Lake continued to be at the mouth of Spring Creek just outside the refuge boundary. Northern pike often lie in the reed beds before going upstream to spawn in the dense aquatic vegetation inside the refuge boundary.

Swan Lake developed into a "hotspot" for kokanee salmon this year. State fishery biologists theorized that the lake's salmon population may have peaked this year. The daily limit was 50 and success was excellent during the summer months.

The salmon fishing success brought an increase in fishing activity at the mouth of Swan River near the refuge boundary.

17. Law Enforcement

The refuge was patrolled on opening day of waterfowl season this year; no "cases" were made. As in past years, other patrol efforts in 1993 were made in conjunction with on-going work activities, including patrol of the Spring Creek access site. In mid-January and early February, several patrols were conducted in an attempt to again control illegal use of snowmobiles on the refuge.

Washtak assisted with the annual NBR L.E. re-qualification in September, as well as fulfilling firearm instructor duties at the 40-hour in-service training at Marana, Arizona.

I. EQUIPMENT AND CONSTRUCTION

4. Equipment Utilization and Replacement

All equipment utilized on the refuge is also used in daily operations and work activities on Flathead County WPA's. In 1993, no new equipment was purchased for exclusive use on the refuge. In August, a 425-square-foot storage addition was built onto the existing refuge shop building. The

Wetland District Narrative has complete details on this project and others.

5. Communications Systems

As with most stations in Region 6, the Creston Hatchery Office has tried to go to ccRemote electronic mail in an attempt to "improve" communications. The effort has been futile for a number of reasons and has resulted in an excessive amount of wasted time by the administrative clerks. Trying to re-invent the wheel and modernize systems sometimes takes more effort than it seems to be worth. At year's end our system was still not "up to speed".

J. OTHER ITEMS

4. Credits

Ray Washtak wrote this report. It was edited by Jon Malcolm and typed by Sharon Hooley.