

NORTHWEST MONTANA WETLAND MANAGEMENT DISTRICT

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana
and
Moiese, Montana
1991

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ANNUAL NARRATIVE REPORT

Calendar Year 1991

U.S. Department of Interior

Fish & Wildlife Service

National Wildlife Refuge System

REVIEW AND APPROVALS

NORTHWEST MONTANA WETLAND MANAGEMENT DISTRICT

Kalispell, Montana

and

Moiese, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1991


Refuge Manager

6-17-92
Date


Project Leader

6/22/92
Date


Refuge Supervisor Review

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Date


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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, Sandmark, Johnson, 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 seven 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. Blasdel WPA is located approximately $1\frac{1}{2}$ miles north of Flathead Lake.

Flathead County WPA's are administered 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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A. HIGHLIGHTS

Despite eight months of below normal precipitation in Flathead County, total precipitation for the year was only .27" below the 30-year-average, (Section B).

Montana Power Company contractors added additional rip-rap to the "demonstration dike" along the north shore of Flathead Lake, (Section I-1).

A public hearing in February indicated local opposition to the proposed north shore erosion control structure on Flathead WPA; FERC officials from Washington viewed Kerr mitigation sites in both Lake and Flathead counties, (Section C-1).

Lake County

Assistant Manager Bill West cooperated with Joe Ball of the Montana Cooperative Wildlife Research Unit in drafting a prospectus for a Five Valleys Wetlands Conservation Project (Joint Venture) in support of the North American Waterfowl Management Plan, (Section D-2).

Private Lands work began in earnest. Refuge personnel negotiated 2 projects that will restore or enhance 60 acres of wetlands in 6 basins. Support was given by Greg Neudecker of the Montana Private Lands Office in negotiating and completing projects that restored 62 acres in 29 wetlands, (Section F-2).

Control of noxious weeds continued as the biggest management problem on Lake County WPA's (Section F-10).

The duck breeding population continued to increase, but estimated production was down due to lack of nesting cover caused by high meadow vole populations in 1990 (Sections D-5, G-3).

B. CLIMATIC CONDITIONS

Climatic conditions in Flathead County were near normal despite having 8 out of 12 months of below normal precipitation and several record high and low temperatures recorded throughout the year.

Total precipitation was 15.15", only .27" below the 30-year-average. Above-average precipitation which fell in January, May, June, and November totalled 9.74" or 65 percent of the year's total. All other months saw below normal precipitation, with a low of .42" received in July.

Heavy, mountain rainfall during May, coupled with warm temperatures, resulted in a rapid initial runoff and local flooding. North valley wetlands filled rapidly. All mountain and valley creeks and streams also filled quickly; the rapid melting of mountain snowpack washed out many roads on Forest Service lands and in Glacier National Park. Lowland flooding of trailer parks adjacent to the Flathead River occurred east of Kalispell. The rapid runoff also resulted in a large sediment plume at the mouth of the Flathead River adjacent to Flathead WPA. The plume persisted well into mid-summer.

Temperatures were generally average throughout the year. A low of -20° was recorded in January; the high for the year was 91° on August 31. Daily record highs were set in August (91°) and October (79°); record lows were set in June (30°), July (38°), August (32°) and October (-1°). The first frost of the year came on August 26 nearly 5 weeks before the County's average "first frost" date of October 1.

Ice-out in shallower potholes occurred on March 25, deeper wetland units were not ice free until April 7. A late October winter storm brought over 6" of snow to the valley floor and sub-freezing temperatures. All wetlands were frozen by month's end; warmer temps in November resulted in periodic thawing; final freeze-up for the year occurred in mid-December. December's 3.5" of snow melted quickly and at year's end little, if any, snow covered upland areas.

Table I. 1991 Climatic Data, Flathead County WPA's*

MONTH	TEMPERATURE		PRECIP.-INCHES		SNOWFALL-1991 INCHES
	HIGH	LOW	1991	30-YR AVG.	
January	42	-20	1.74	1.38	25.9
February	47	10	.45	1.01	1.6
March	63	8	.81	.97	4.4
April	70	23	.85	.97	4.2
May	75	27	2.26	1.67	
June	77	30	3.58	2.14	
July	90	38	.42	1.07	
August	91	32	.72	1.15	
September	84	30	.67	1.25	
October	79	- 1	.84	1.01	6.3
November	49	- 4	2.16	1.40	14.7
December	45	11	.65	1.40	4.6
Totals			15.15	15.42	61.7

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

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 only land acquisition in the Wetland Management District resulted from a land trade that added 15.18 acres to the Kickinghorse WPA. The Service traded away one acre of land at the entrance to the National Bison Range and acquisition funds made up the difference. There are 8 wetlands on the tract totalling 3 acres or 20 percent wet. However, 300 feet of highway frontage and the fact that it buffers the WPA from a salvage yard and a restaurant heightened the justification for purchase.

Other wetland acquisition potentials within the wetland district under the Northwest Power Planning Act continued to be delayed due to bureaucratic foot-dragging by Power Council members and a reluctance by the State to actively meet waterfowl mitigation goals through wetland purchases.

In addition, there was no acquisition under the Kerr Mitigation Program. This program, designed to replace wetland habitat lost to erosion along the north shore of Flathead Lake has been delayed for several years.

In February, FERC officials from Washington toured several mitigation sites in both Flathead and Lake Counties (Figure 1). A public hearing was also held concerning the management and mitigation plan. Opposition was voiced over the proposed north shore erosion control structure, as well as several other aspects of the plan. Several special interest groups have threatened the entire program with lawsuits. This fact, and continued delays by other agencies in submitting mitigation proposals may delay acquisition implementation by several years.



Figure 1. Assistant Manager Washtak showed FERC officials, members of special interest groups, and the local public the results of wave induced erosion along the north shore of Flathead Lake in mid-February. The erosion is caused by Kerr Dam, located at the south end of the Lake. For power generating reasons, lake levels are held abnormally high from June through September. Several studies have shown that over 2,000 acres of wetland and upland habitat have been lost, most of it on the WPA. LL 2/13/91

Despite our efforts in presenting wetland acquisition proposals, attendance at many meetings, and generally trying to resolve the many issues related to both mitigation programs, there has been no acquisition under either mitigation program. The entire mitigative process over the last 6 years has been extremely frustrating, and time consuming. In the meantime, we

see continued threats imposed on the approximately 17,500 acres of wetlands we have delineated. At this point, we have nearly given up on seeing any mitigative acquisition in the near future; and as always, it's the resource that suffers most!

3. Other

Land acquisition in the Flathead Valley should be accelerated to address the danger of wholesale subdivision. Although FWS has purchased WPA land in the past, we had hoped that the two mitigation programs would provide future acquisition funds. However, good projects have been dropped from consideration because political appointees on the mitigation advisory committee are opposed to acquisitions. Consequently, mitigation has actually hindered rather than helped resource plans for the District. At this point the process is stifling refuge plans because everyone assumes that mitigation dollars will meet the need. That is not the case. The FWS should consider the mitigation process as additive to our program rather than as a substitute. Currently, the tail is wagging the dog in the Flathead Valley.

This District does not have the same tools as others in the Region. As an example there is no easement program here. Also, fee acquisitions are hindered by the lack of adequate realtors within in the state. There are seven staffed refuges in the state, five of these also have Wetland Districts. There are four staffed substations and eleven satellite refuges yet there are only two Realty positions and these are both in Lewistown. Montana is the fourth largest state in the Union so logistics alone should justify more staff. The realty backlog is the best sign that things are not getting done. In the mean time, tremendous resource areas are being lost as people rush to buy land in Montana. Along with the change comes all that goes with suburbia; feral cats, unattended dogs, weeds, overgrazed horse pastures and 20-acre fenced lots.

If subdivision continues in Flathead County and the Ninepipe wetland complex, human encroachment will fragment the area beyond repair and its tremendous wildlife values will never be recovered (Figure 2).



Figure 2. Subdivision is steamrolling in Flathead County and we are beginning to see its effects in Lake County, also. Besides all the other threats, there is a more permanent change happening to wetland resources within the District. A new wave of wealthy buyers seem to prefer building homes next to the WPA's and on the edge of permanent wetlands. This million-dollar log home will be ringed by a manicured lawn and \$140,000 in non-native deciduous trees. Sandmark WPA, a 400-acre-tract with 300 plus duck nests and 25 short-eared owl nests in 1990 and a 70 percent Mayfield success rate is in the adjacent background. BW 1/92

D. PLANNING

2. Management Plan

At year's end, the Refuge and the Montana Cooperative Wildlife Research Unit had drafted a prospectus to begin a project under the Prairie Pothole Joint Venture of the North American Waterfowl Management Plan. It is titled the Five Valleys Wetland Conservation Project. Preliminary actions are to emphasize conservation easements to reduce subdivision of private lands and acquisition to remedy fragmentation problems around existing public lands. Additional proposed activities include restoration of drained wetlands, reintroduction of extirpated species, development of private lands for wildlife and fish habitat through better management of grazing, and restoration of native plant communities. Wildlife and fisheries benefits from irrigation projects can be improved through increased cooperation with irrigation projects. Development of an aggressive program for biological control of weeds will benefit both wildlife and agricultural interests. The five valleys include the Flathead, Bitterroot, Blackfoot, Clark Fork and Swan.

4. Compliance with Environmental & Cultural Resource Mandates

The Confederated Salish & Kootenai Tribes were contacted prior to wetland enhancement work on private lands in the Ninepipe wetland complex. Their Shoreline Protection Division reviewed 2 projects negotiated by Bison Range personnel and several projects involving ditch plugs and low level dikes negotiated by Greg Neudecker of the FWS Montana Private Lands Office. The review process used by the Tribes is similar to the U.S. Army Corps of Engineers' 404 process. All 30 projects were approved. For more information on wetland restorations see Section F-2.

5. Research and Investigations

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

This was the sixth year of study on Lake County wetlands in a 17-square-mile predator removal area. Mr. Forman's graduate studies are a follow-up to

earlier studies by Nate Hall.. This long-term study was initiated after three years of data indicated that Mayfield nest success was only 20.7 percent (1986-88). Predator removal was initiated in 1988 and has continued since.

Three nest searches were completed between April 25 and July 3 on 887 acres within the skunk removal area surrounding Ninepipe NWR; 265 acres were searched during the same period at the Pablo National Wildlife Refuge (non-removal area). Twenty-six skunks were removed between March 20 and July 5. This represented a continual decrease from captures in 1988 (N=109), 1989 (N=77) and 1990 (N=32). The decline has been due to the removal program. This was confirmed by scent station monitoring which indicated skunk populations remained high in 1991 at Pablo NWR and areas of the Flathead Valley outside the removal area.

Mayfield nest success was 24.5 percent (N=279 nests, 95 percent CI 19.5-30.9 percent) in the removal area. This was a decrease from the 59 percent found last year. However, it was significantly greater than the Mayfield of 10 percent (95 percent CI 4.7-21.0 percent) observed from a 52 nest sample at Pablo NWR.

Lack of residual nesting cover (resulting from high *Microtus* "grazing" last year) and the absence of a key alternative prey source (due to a cyclic crash in *Microtus* this spring), combined to create unfavorable nesting conditions in Lake County this year. Despite these factors, nest success rates in the Ninepipe area remained above baseline (pre-skunk removal) levels and also exceeded the theoretical threshold needed for population viability. In contrast, the 10 percent Mayfield observed at Pablo is the lowest nest success ever recorded at this site and is insufficient to maintain long-term population stability.

While nest success declined, breeding pair and nest densities in the Ninepipe area remained at levels considerably higher than those currently being reported from comparable habitats throughout the Prairie Pothole Region. Depending on habitat conditions and the degree of homing, this trend would be expected to continue.

Breeding duck populations were surveyed on 100 randomly selected wetland basins on state, federal, or tribal land within the removal area. A total of 295 indicated breeding pairs were surveyed on 91 "wet" basins, and dabbling duck densities reached 11.0 pairs/wetland ha.

NWMTWMD-NR-91 - Effects of Nest Predators on Ground-nesting Bird Communities in Northwest Montana. William Swaney, University of Montana.

This was the first year of study relating nest success of ground nesting birds, other than ducks, to the removal of skunks. This study is a companion to the research described above. The objectives are to describe the distribution, abundance, and species composition of nesting bird communities relative to habitat type and cover density and to quantify nest success of the most common non-game bird species in relation to habitat quality and predator populations.

Totals of 89 (0.1/acre) and 13 (0.03/acre) nests were found in the removal and control areas. Species included western meadowlark (31), short-eared owl (27), common snipe (11), ring-necked pheasant (9), killdeer (8), Wilson's phalarope (6), savannah sparrow (4), spotted sandpiper (2), vesper sparrow (2), northern harrier (1), and American avocet (1).

Mayfield estimates of nest success on the removal area were 49 percent for western meadowlarks and 21 percent for short-eared owls, although sample sizes were too low to allow precise estimates. For some species (i.e., meadowlarks, pheasants, and sparrows), it became obvious that we were unable to find many of the nests that were present and also that the proportion of nests found probably varied with cover density. Analyses of the number of birds flushed to the number of nests found are being conducted, and that part of the project will receive more emphasis in 1992. In addition, dummy nests will be used in 1992 to evaluate nest success.

E. ADMINISTRATION

1. Personnel

All WMD personnel, with the exception of Assistant Manager Washtak and other north valley seasonal employees, are headquartered at the National Bison Range near Moiese, MT. 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, who is headquartered at the Creston Fish and Wildlife Center (Figure 3). 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 Fish and Wildlife Enhancement, Fish and Wildlife Management Assistance, and Hatcheries are also headquartered at the Center.



Figure 3. Ray Washtak, on-site Assistant Manager for Flathead County WPA's, (that's Ray on the right). PG 6/1/92

On April 7, Paul Gelhar EOD as a Biological Aid (Wildlife) to assist with WMD and Refuge operations in Flathead County (Figure 4).



Figure 4. Biological Aid Paul Gelhar. This was Paul's 2nd 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. RW 6/1/92

Daily clerical support for the WMD operations in Flathead County is provided by the Fish and Wildlife Center's Office Assistant and Clerk Typist. The Refuge Assistant at the Bison Range provides administrative support for detailed WMD administration. Office space and clerical assistance at the Fish and Wildlife Center is provided on a cooperative reimbursable basis.

2. Youth Programs

There were four YCC's and one Montana Human Resource youth employed at the National Bison Range. These young people helped with several projects on Lake County WPA's. Projects included weed cutting, trash pickup, mowing, fencing, and rock picking.

4. Volunteers

Rita Gelhar, Anthony Gelhar, and Amy and Jennifer Washtak volunteered approximately 120 hours assisting with north valley work projects including painting the Refuge office and shop building, nest dragging, and fencing.

The Flathead Resource Organization and The Flathead Chapter of the National Audubon Society volunteered a total of 50 man hours of pulling and digging purple loosestrife in Lake County wetlands.

Several members of the Kalispell Ducks Unlimited "Greenwing" Club inspected all goose structures for use on Smith Lake.

In April, volunteers from Flathead Wildlife Inc. put up several wood duck boxes on Smith Lake and Batavia WPA's (Figure 5).



Figure 5. Volunteers from Kalispell's local sportsmen's club installed several wood duck boxes on north valley WPA's. The boxes were used mostly by common goldeneyes. One box on Smith Lake lost its top during a wind storm, the nesting box was subsequently used by a hen mallard who successfully hatched 10 ducklings.
RW 4/6/91

5. Funding

Operational funding for the entire Wetland District is included in the annual appropriation of the National Bison Range (NBR). Funding for WPA's in Flathead County is broken down separately based on annual work plans submitted by the Assistant Manager at Creston. For FY 91, north valley expenditures totalled \$65,100; an additional \$18,400 was allocated for several maintenance management projects (1262). At year's end

we had not received final word on FY 92 funding; FY 92 work plans tentatively requested \$74,600 for north valley operations.

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
88	64,000	
89	68,100	
90	63,500	
91	65,100	\$18,400 (Maint. 1262 funds)
92	74,600	(tentative figure)

6. Safety

Staff members stationed at the National Bison Range attended routine Safety meetings. Much of the safety program at NBR is related to the use of herbicides, mowing machines and water safety.

North valley Refuge personnel attended safety meetings when conducted at the Fisheries Center. As in past years, blood screening tests for rabies immunity levels were completed on all personnel involved in predator control operations.

All WMD personnel attended a "Boating Skills and Seamanship" safety course presented by the Coast Guard Auxiliary in Flathead County.

J. Malcolm, B. West, and R. Washtak attended the eight-hour Aviation Safety training in Billings, MT in February.

7. Technical Assistance

Ray Washtak and Paul Gelhar completed mourning dove surveys in Flathead and Lincoln Counties. Bill West completed a dove survey in Sanders County.

Ray Washtak served as a Science Fair judge for local elementary school exhibits in May; Ray also served as Science Fair judge at the county level. Lynn Clark served as a judge for the Lake County 4-H Fair in Wildlife Forestry and Range Conservation.

Ray continued to provide technical assistance to the local SCS and ASCS office concerning cropping practices on Farm Bill lands and wetland delineations in Flathead County. Technical assistance was also provided to two private landowners concerning wetland development and enhancement.

Bio-Aid Gelhar assisted TA division with electro-shocking operations at Lee Metcalf NWR in April.

Bill West assisted Lake County SCS in evaluating weed control options on CRP lands and completed two minimal effects determinations on proposed spring developments for Sanders County SCS. West also reviewed seven FmHA inventory properties for possible easement restrictions to protect or restore wetlands.

Marcy Bishop and Lynn Clark of the National Bison Range Staff completed three Breeding Bird Surveys in Lake and Sanders Counties.

8. Other

Meetings and/or training attended this year included:

J. Malcolm, R. Washtak, and B. West:
Several coordination, planning, and advisory board meetings with BIA, FWS, MDFWP, Forest Service biologists and other special interest groups concerning BPA/Kerr mitigation. Mid-year and end-of-year Project Leaders meeting and annual work plan meetings; Diversity in the Workplace training, Billings, MT; Intermountain Joint Venture meeting, Missoula, MT.

B. West:
The annual meeting of the Montana Wildlife Society Chapter, Bozeman, MT; annual L.E. Re-certification, Marana, Arizona.

J. Malcolm and B. West:
Annual meeting of the Flathead Valley Canada Goose Committee at NBR.

R. Washtak:

Flathead County CRD meetings; L.E. Re-certification at Marana, Arizona; local BPA/Kerr mitigation meetings.

F. HABITAT MANAGEMENT

2. Wetlands

Lake County

Potholes on Lake County WPA's were in fair shape. However, lack of run-off from snow melt in recent years has taken a toll on permanent and semi-permanent wetlands. Johnson WPA in the northwest portion of the Ninepipe wetland complex was nearly dry except for basins that benefit from irrigation water. None of the 67 wetlands restored in 1989 have filled with water, yet. Wetland conditions were maintained through mid-July by heavy rainfall in June. Water levels in Lake County wetlands receded through the end of the year due to very dry conditions.

As in most years, wetlands on Herak, Montgomery and Sandsmark WPA's were recharged with water diverted from the Flathead Irrigation Project. Although 716 acres of these WPA's are assessed irrigation taxes, we only diverted about 40 acre-feet or 1/18 of our allotment. Wildlife use of these wetlands was good.

A local sawmill has been offering its waste wood products to local landowners to fill their wetlands (Figure 6). The Refuge staff tried to motivate action from the Corps of Engineers regulatory branch in Helena, but no action has been taken in over a year. The COE has agreed that wetland filling regulations have been violated. However, action has apparently been delayed due to confusion about recent changes in wetland regulations nationwide. FWS has done its job by reporting violations, but regulators have not followed through on their responsibility.



Figure 6. A local post and pole plant has been providing wood materials, boards and sawdust to nearby landowners for filling wetlands. Although this involves three landowners, and six basins and has been going on over the past six years, the Corps of Engineers has yet to contact any of the parties involved. Wetland laws are not protecting wetlands in western Montana. BW 1/92

The Montana Private Lands Program came to this district in 1991 and some very good projects were completed. The Refuge staff negotiated two agreements early in the year that will restore/enhance 45 acres of wetlands in 6 basins on the Duck Haven WPA and adjacent private lands. Later in the year, Greg Neudecker of the Private Lands Office negotiated agreements to restore 29 wetlands with 62 surface acres and a 12-acre fenced enclosure was constructed around a 5-acre basin to exclude grazing. Much of the work is summarized in photos on the following pages (Figures 7, 8, 9, 10, and 11).



Figure 7. Construction of a dam which started in October will restore this 15-acre wetland. An aerial view (next photo) also shows the wetland more clearly. JM 10/91



Figure 8. The 15-acre wetland will catch runoff from Crow Creek via the Duck Haven WPA on the left in the top photo. A 10-year grazing agreement involving a portion of the WPA was the clincher that convinced this landowner to allow construction. BW 1/92



Figure 9. This spring fed wetland on the Frank Webster property had a six-foot-deep ditch out of it. A riser and stoplogs will allow the owner to maintain water levels that will not damage his alfalfa. He can watch nesting geese from his picture window with a scope. He was very happy. GN 9/91



Figure 10. An Extension Agreement was made with a private landowner on Crow Creek to repair a washout in the north creek bank. The plug will raise water levels upstream and help divert water through a culvert to Duck Haven WPA. This will help restore/enhance 45 acres on the WPA and 15 acres in a basin on adjacent private land. JM 4/91



Figure 11. This three-acre wetland was easily restored with a ditch plug (left center) and water from the irrigation project. GN 9/91

Flathead County

Wetland levels on Flathead County WPA's were in excellent shape again this year. Over 6.5" of rain fell in April, May, and June contributing to an abundance of Type I wetlands throughout the county; snowmelt also added additional water to more permanent wetlands. Warm temperatures, heavy mountain rainfall and rapid melting of mountain snowpack during May resulted in lowland flooding along streams, creeks and the Flathead River. Hayed meadows on Smith Lake WPA filled quickly and remained full into the late summer months. Recharging of Batavia WPA's three marsh pools in April required only 214 acre-feet.

4. Croplands

Barley plantings on Blasdel WPA were rotated so that last year's 30-acre plot in unit 9 was summer fallowed this year; last year's 30-acre fallowed portion was

planted to barley in May. Rotating the plantings each year is done in an effort to control weeds and reduce herbicide use. The permittee harvested all barley in the unit, but left 5 acres in unit 8 as a food plot.

In 1991, the DNC in the north half of unit 4 was disked and fallowed (Figures 12 and 13).



Figure 12. This photo shows deteriorated DNC in the north half of unit 4. Habitat such as this does little for early nesting waterfowl. The reason for the lack of vegetative vigor is unknown since the south half of the unit was in excellent shape. One reason may be soils, which differ from the south half of the unit. This portion of the unit also had heavy infestations of Canada thistle.
RW 4/12/91



Figure 13. The unit was fallowed during the summer in an effort to control the thistle growth. The unit will be reseeded with cool season grasses and a light mix of alfalfa in the spring of 1992. RW 10/11/91

In July, the 4-row shelterbelt on Blasdel WPA was tilled again by a cooperator to control weed growth.

Cooperative farming in Lake County involved two cooperators who were responsible for cleaning up weed problems and seeding DNC on three WPA's. In return, they planted the fields to winter wheat in the fall of 1990. June rains made for an excellent crop on 160 acres at Kickinghorse WPA. This field was also seeded to dense nesting cover (DNC) on the west half and native grasses (rough fescue, Idaho fescue, bluebunch wheat grass and basin wildrye) on the east half.

This field is too wet to farm in the spring so an air seeder was employed to dormant seed the grasses in January on frozen ground with 3 inches of snow (Figure 14). First indications were that we only got a fair catch. Only time will tell. Similar methods were used at Sandsmark WPA (70 acres) and Montgomery WPA (20 acres) but very bad infestations of whitetop caused failures in both the wheat and the DNC on those 90 acres.



Figure 14. Kickinghorse WPA is very soggy ground and is nearly impossible to farm in the spring. Dense nesting cover was seeded into winter wheat stubble in January using an air seeder. BW 1/19

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 burning, haying, grazing, and control of noxious weeds. Vegetative growth, mulch buildup and subsequent applied management continue to be monitored through photo points and Robel readings taken each spring and fall.

Lake County WPA grasslands are composed primarily of quack grass, Kentucky bluegrass and DNC plantings. Several older DNC plantings have weed problems, with whitetop (*Cardaria draba*) especially bad in otherwise healthy fields.

Most of the grass was totally denuded from Lake County WPA's in 1990 by huge populations of Microtus sp. These populations crashed in early February, but the damage had already been done. Although there was no residual cover for ground nesting birds, the mice might have actually helped the grasslands in the long run by stirring up the soil, removing old duff and fertilizing the area. Above normal rainfall in June brought a robust return of the grasses (Figure 15).



Figure 15. At Duckhaven WPA a 1989 cover planting financed by the Mission Valley Chapter of Pheasants Forever matured and was a real advertisement for their program.
JM 9/91

7. Grazing

In 1991, the permittee continued annual shoreline grazing of unit 8 on Smith Lake. The purpose of the graze was to provide goose browse for broods hatched on.

the WPA. Approximately 20 AUM's were removed, results were excellent, and the shoreline received considerable use by 50-60 goslings.

As part of a Wildlife Extension Agreement that resulted in the restoration of a 15-acre wetland on private land the owner will graze one of three 80-acre paddocks per year on the Duck Haven WPA. Each unit will be fall grazed once every 3 years at full utilization as a management tool to prevent eventual matting and deterioration. The land owner will receive the first 30 AUM's free of charge and will reimburse FWS for the balance of up to 160 AUM's at the going rate by providing weed mowing and spraying services on the WPA. The first 80 acres was grazed from November 10 to December 25, with 160 AUM's used. There was still some patchy cover left at turnout.

8. Haying

Only one bid was received this year for the hay units surrounding Smith Lake. High water levels within the reed canary grass meadows prevented the permittee from haying the units as planned. An estimated 40 acres were hayed this year, compared to the 150+ acres normally cut each year. The meadows are mowed annually in order to "open up the marsh" and provide additional pair habitat the following spring.

Two bids were received for 191 acres of DNC and tame grass hay on Blasdel WPA. Units 1, W $\frac{1}{2}$ of 3, 6, 8, and the east portion of unit 7 were hayed in an effort to stimulate the vegetation, remove the mulch buildup, and control noxious weeds (Figures 16 and 17).



Figure 16. The permittee took only 3 days to cut and swath the 191 acres. All haying was done in mid-July after the nesting season. Bales are removed within 10 days to prevent damage to the cover under each bale.
RW 7/23/91



Figure 17. Regrowth of the alfalfa and cool season grasses on hayed units was poor due to lack of precipitation during July, August, and September. As a result, we may see limited nesting in 1992 unless adequate regrowth occurs during the early spring months.
RW 10/11/91

9. Fire Management

Only one prescribed burn was conducted on Flathead County WPA's this year. On April 12, the north half of unit 4 (approx. 40 acres) was burned to remove the heavy residual mulch buildup prior to the permittee disking the area.

There were no prescribed fires and no wild fires on Lake County WPA's.

10. Pest Control

Canada thistle remains the most persistent and common noxious weed found on Flathead County WPA's. Infestations are widely scattered throughout the upland units making control difficult. Other noxious weeds include spotted knapweed and musk thistle. Knapweed infestations can be found on Batavia, Blasdel, and Flathead. Musk thistle is located in the upland units on Smith Lake and Batavia.

In 1991, herbicide use was limited to 2,4-D. All herbicides were applied force account or by personnel from the County Weed Department. Using a rate of .5 lbs. AE/acre, we obtained adequate control in most units; however, persistent rains in late May and June often negated and limited our efforts. Approximately 28 acres were treated this year using a portable sprayer mounted on a 4x4 ATV (Figure 18).



Figure 18. Our new 4x4 ATV came in handy when it was time to spray scattered Canada thistle infestations. The sprayer was borrowed from the County Weed Department at no cost. This setup proved to be very efficient; the hand-held sprayer allowed us to target only thistles, which saved on chemical costs as well as avoiding overspray that is common with boom spraying. RW 8/28/91

An additional 15 acres of heavily infested upland areas were mowed to prevent the spread of thistle seed. In 1992, we intend to use the herbicide "Curtail" (pending approval of the pesticide proposal) to control thistle growth. The local weed department has reported controls of up to 70 percent using this herbicide, that has both a foliar and systemic killing action.

Musk thistle infestations on Batavia were held in check by the thistle head weevil (Rhynocyllus conicus). Small infestations of knapweed were controlled by hand-pulling the weed wherever we saw it. In May, we released additional knapweed larvae (U. affinis and U. quadrifasciata) in an effort to promote biological control of this persistent weed (Figure 19).



Figure 19. Fly-infested knapweed bouquets were collected near Missoula, MT and placed near the more heavily infested units on Batavia WPA in late May. The two species of seed head gall flies in the bouquets will, hopefully, spread onto the WPA, thereby reducing the troublesome weed without the use of chemicals. PG 5/29/91

Noxious weed problems continued to plague Lake County WPA's. Whitetop remained the worst problem, but spotted knapweed, sulfur cinquefoil, and Dalmation toadflax also increased. Purple loosestrife was well established in several wetlands on adjacent land. Canada thistle was also widespread, but held in check by feeding activity of painted lady butterfly larvae and stem-mining weevils.

Crop fields were fallowed 3 times in 1990 and success was good on all crop weeds except whitetop, which flourished under tillage. Whitetop was also our biggest problem in grasslands (Figure 20). Mowing was the primary control method for the third straight year. There were 275 weed infested acres mowed on the WPA's near parking lots, along roads and in the middle of badly infested grasslands. This was more than twice the acres mowed in the past. Mowing has been moderately successful at controlling Canada thistle, and has kept whitetop from seeding, mowing has also suppressed whitetop stands in some years when adequate rainfall after mowing stimulated regrowth of grasses. One 80-acre field of whitetop was intensively grazed by 300 angora goats during May. Although the grass response was favorable the goats did not eat the whitetop until all other forage had been removed. Even after all alternative methods were employed, the whitetop still required application of a broad leaf herbicide to keep it in check.



Figure 20. Whitetop or Hoary Cress (Cardria draba) is just one of the eight, very bad weeds in the District. At Sandsmark WPA we tried to summer fallow this field for two years prior to planting winter wheat in the fall of 1990. Although we were trying to avoid the use of herbicides, we eventually did use them when the cooperator's wheat field came up white last May. BW 5/91

Grassland chemical control efforts on Lake County WPA's totalled 110 acres for whitetop and knapweed. The majority of the knapweed work was on the newly acquired Duck Haven WPA. Much of the whitetop work was on Sandsmark WPA. This involved boom and spot spraying 2,4-D at 1.9 pounds AE per acre. This was a 10 percent increase in treated acres from 1990 due to a dramatic increase in whitetop in areas where the *Microtus* had stirred up the soil. An experimental application of Tordon on 11 acres of Duck Haven WPA was implemented. Initial results appeared excellent. A co-op farmer treated an additional 85 acres with 2,4-D to address severe whitetop problems in farmed units of winter wheat at Sandsmark and Montgomery WPA's.

Table III. Herbicide Use on Lake County WPA's in 1991

Target Species	Herbicide	Rate*	Acres	Application Method
Knapweed, whitetop, & thistle (Grassland)	2,4-D	1.9lb/acre	99	Spot spray & Ground-boom
Whitetop (Grassland)	Tordon	1 lb/acre	11	Experimental (boom sprayed)
Whitetop (Cropland)	2,4-D	1 lb/acre	85	Co-op Farmer (boom sprayed)

*Pounds acid equivalent

Purple loosestrife in Lake County wetlands was again addressed by efforts of the Lake County Purple Loosestrife Committee. Since this plant is located on state, federal, tribal, and private lands, the Committee brought together all concerned groups. These included the Lake County Weed District, FWS, Montana Dept. of Fish, Wildlife & Parks, The Confederated Salish & Kootenai Tribes, The Flathead Resource Organization (an environmental group concerned about spraying herbicides), and the Flathead and Five Valleys Chapters of The National Audubon Society. Over the past 4 years the Lake County Loosestrife Committee has raised over \$30,000 locally and obtained an equal amount from the Montana Noxious Weed Trust Fund.

Ninety-five different sites were treated with glyphosate (Rodeo) herbicide from mid-July to early September. A one percent solution was applied at most sites using three gallon SOLO backpack sprayers. This is up from 65 sites in 1990 and 50 sites in 1989. However, plant density has been reduced at most sites. There are about 120 infested acres in the county, up from 100 in 1990. Only 3 wetlands on FWS lands are contaminated, but the potential for habitat degradation is great.

The Flathead Resource Organization, the Bigfork Audubon Chapter and the Bison Range staff dug and pulled loosestrife at three sites totalling about two acres. This effort was concentrated at the Ninepipe National Wildlife Refuge and on State Game Management land.

Contacts with Richard Malecki .PhD, the Assistant Leader of the New York Cooperative Wildlife Research Unit, Cornell University, resulted in two local presentations on progress toward biological control options for loosestrife. Dr. Malecki is working with the USDA Agriculture Research Service, Beltsville, Maryland to release three insects on this weed. Hopefully Lake County will see releases of all three types of insects in 1992.

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 water levels were adequate and we did not see the need for it. In 1991, 581 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 and for hunter use in the fall.

The Fish and Wildlife Service was again assessed a yearly fee for irrigation water and ditch maintenance by the Flathead Irrigation Project, irregardless of the amount of water used. Water releases and diversions are made by personnel of the Project. This year's assessment totaled \$14,194.47 or \$19.80 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 1991, but only 40 acre-feet were used for recharging wetlands.

G. WILDLIFE

2. Endangered and Threatened Species

Bald eagle numbers were down this year, probably because of the mild winter. They normally concentrate in lower Flathead Valley in early winter, and are associated with the tail-end of the waterfowl migration and just prior to freeze-up. There were 7 bald eagles

counted in the vicinity of Lake County wetlands in mid-December. This compares with 13 in 1990. Peregrine falcons were rare but consistent visitors to the lower Flathead Valley in the fall and winter. Most sightings coincided with concentrations of ducks. One peregrine was observed on the 1991 Christmas Bird Count. No grizzly bears or wolves were noted this year but they are occasional migrants through the area.

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 completed the bald eagle survey in June of this year and renamed the two nests on the WPA. The "east nest" was named "North Shore" while the "west nest" site was renamed "Dedman"; both names will help clarify past confusion of which nest was which, and will allow for better nest identification in the future. In 1991, five eaglets were fledged on the WPA. In addition, the "Fennon Slough" nest, located 1.5 miles north of Flathead WPA and adjacent to the Flathead River was occupied by a new nesting pair this year. In past years this nest and the "Dedman" nest site were often occupied by the same pair on a rotating basis.

Use of the WPA by migrating and/or transient bald eagles continued in 1991 with several other adults observed on numerous occasions. In mid-October, five adults and five immature bald eagles were observed on Flathead WPA. Two adult bald eagles were also observed on several occasions during the spring and early summer months on Smith Lake WPA. In April, an adult golden eagle was observed roosting in trees near the lake's shoreline.

3. Waterfowl

The 1991 Canada goose aerial pair counts on Flathead County WPA's revealed a total of 58 pairs, a decrease of 38 percent from 1990 figures. Brood counts conducted in early June indicated 222 goslings were produced on the four WPA's; up 5 percent from last year's estimates. However, as in past years, many of the 114 goslings observed on Flathead WPA may not have actually hatched on the WPA, but migrated to the north shore from nest sites along the Flathead River. Table IV summarizes this year's estimated Canada goose production in Flathead County.

Table IV. Canada Goose Production, Flathead County
WPA's, 1991

Unit	Number of Pairs Observed	Number of Goslings Observed
Batavia	4	34
Smith Lake	21	48
Flathead	29	114*
Blasdel	4	26

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

Spring counts of Canada geese tallied 31 pairs on 6 Lake County WPA's and an estimated 93 goslings were produced. All artificial nesting structures and 2 small islands constructed on Duck Haven WPA were used. Fall goose use of the WPA's was fair at Kickinghorse and Johnson WPA's. Both areas are managed more for nesting than for feeding, but the birds are attracted to grain stubble and the permanent wetlands.

Other waterfowl species that were often observed on the WPA's this year include tundra and trumpeter swans (Figure 21).



Figure 21. Both tundra swans and trumpeters wintered in the District in 1991. Sightings were common in Lake and Flathead Counties. Nearly 300 tundra swans were observed on Flathead WPA in early April. JM 4/91

The valley-wide aerial census revealed 869 breeding pairs of Canada geese, down 3.0 percent from 1990. However, the number of pairs increased 255 when compared with the ten-year-average. The aerial brood count tallied 1,529 young, up 8 percent from last year. Heavy mountain runoff and June's rainfall again hampered our brood count efforts, especially along portions of the Flathead River in Flathead County.

Duck breeding pair habitat was only fair on most Lake County WPA's. Average snowpack and lack of a winter frost seal in the soil prevented good runoff and pooling. There were 683 pairs of ducks tallied on Lake County WPA's, an increase of 22 percent over the 1990 pair counts and up 44 percent since 1989. This trend is probably related to several years of increased recruitment resulting from skunk removal in a 17-square-mile area that surrounds most of the Lake County WPA's.

Duck production was estimated on Lake County WPA's by multiplying the spring breeding pair count numbers by the average hen productivity, then multiplying by the average brood size which was 4.7 ducklings and finally multiplying by a 70 percent estimated survival of ducklings from brood count to fledgling. The average annual hen productivity was about 44 percent, and reflected results of nesting studies by a University of Montana graduate study (see Section D-5). The following table summarizes this year's breeding pair and production numbers.

Table V. 1991 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's.

Species	# Pairs	Production
<u>*Montgomery WPA</u>		
Mallard	15	22
Shoveler	2	3
Gadwall	3	4
Cinnamon teal	8	12
Ring-necked duck	3	4
Lesser scaup	2	3
Ruddy duck	1	1
Redhead	<u>10</u>	<u>14</u>
* subtotal *	44	63
<u>*Kickinghorse WPA</u>		
Mallard	36	52
Gadwall	10	14
Cinnamon teal	31	45
Blue-winged teal	15	22
Shoveler	14	20
Wigeon	8	12
Wood duck	1	1
Ring-necked duck	1	1
Common goldeneye	1	1
Redhead	<u>16</u>	<u>23</u>
* subtotal *	133	191

Table V. 1991 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's (cont.)

Species	# Pairs	Production
<u>*Herak WPA</u>		
Mallard	16	23
Cinnamon teal	8	12
Shoveler	17	25
Gadwall	4	6
Redhead	4	6
Ring-necked duck	<u>2</u>	<u>3</u>
* subtotal *	51	75
 <u>*Johnson WPA</u>		
Mallard	33	48
Gadwall	7	10
Cinnamon teal	15	22
Blue-winged teal	3	4
Green-winged teal	1	1
Shoveler	6	9
Redhead	7	10
Ring-necked duck	8	12
Lesser scaup	<u>1</u>	<u>1</u>
* subtotal *	81	117
 <u>*Johnson 80 WPA</u>		
Mallard	2	3
Cinnamon teal	2	3
Shoveler	3	4
Gadwall	7	10
Pintail	1	1
Wood duck	1	1
Redhead	7	10
Ring-necked duck	2	3
Lesser scaup	3	4
Bufflehead	<u>3</u>	<u>4</u>
* subtotal *	31	43

Table V. 1991 Duck Breeding Pair Counts and Estimated Production for Lake County WPA's (cont.)

Species	# Pairs	Production
<u>*Sandsmark WPA</u>		
Mallard	26	38
Pintail	5	7
Gadwall	14	20
Shoveler	18	26
Cinnamon teal	31	45
Blue-winged teal	3	4
Green-winged teal	2	3
Redhead	21	30
Ring-necked duck	1	1
Ruddy duck	<u>4</u>	<u>6</u>
* subtotal *	125	180
<u>*Duck Haven WPA</u>		
Mallard	43	62
Redhead	38	55
Shoveler	27	39
Cinnamon teal	40	59
Blue-winged teal	7	10
Gadwall	37	54
Wigeon	13	19
Pintail	1	1
Green-winged teal	3	4
Ruddy duck	3	4
Bufflehead	2	3
Canvasback	1	1
Lesser scaup	<u>3</u>	<u>4</u>
* subtotal *	218	315
*** Total ***	<u>683</u>	<u>984</u>

Estimated duck production on Lake County WPA's was down 30 percent from 1990 (984 fledged vs 1,632 fledged), despite the increase in breeding pairs. Most of the reduction is related to poor residual nesting cover which allowed increased nest depredation by birds (magpies and ravens). The poor cover was a result of "grazing" by huge populations of Microtus sp.

The Montana Cooperative Research Unit initiated duck banding operations at several sites in the Ninepipe wetland complex, but ultimately Duck Haven WPA was the primary trap site for 1991. Approximately 150 ducks, mostly mallards, were banded.

In Flathead County, duck pair habitat was excellent throughout the months of April, May, and June due to a 16 percent increase in average precipitation the first 6 months of the year. Aerial surveys in April indicated all permanent and semi-permanent basins were full for the second consecutive year. By mid-April, water levels within the hayed meadows on Smith Lake were at an all-time high. In addition, snowmelt and rainfall also filled Type I potholes throughout the County resulting in a large dispersal of migrating waterfowl during the spring months. The excellent habitat conditions resulted in a 36 percent increase in duck pair counts over 1990.

Duck production on Flathead County WPA's was calculated using a hen productivity rate of .32, based on nest searches conducted on Lake County WPA's. Using this productivity rate, an average brood size of 4.6 and a brood survival rate of .7, estimated production for 1991 came to 623, an 18 percent decline from last year's estimates. The reason for the decline, even with an increase in pairs, may be attributed to extremely wet weather in June, possibly causing some duckling mortality.

Despite three years of predator control on Blasdel WPA, observed nesting success was calculated to be 39 percent, a decline of 20 percent from last year's nest drag data. The reason for the decline is unknown. It may be attributed to the mobility of the skunk population, an increase in other predator numbers, (foxes, feral cats, etc.) or the fact that we may not be effectively controlling the skunk population by trapping just the WPA. Pair count data and production estimates for Flathead County units are summarized in Table VI.

Table VI. 1991 Duck Breeding Pair Counts and Estimated Production for Flathead County WPA's.

Species	# Pairs	Production
<u>*Flathead WPA</u>		
Mallard	30	31
Pintail	4	4
Blue-winged teal	4	4
Wigeon	1	1
Shoveler	1	1
Lesser scaup	1	1
Common goldeneye	2	2
Bufflehead	<u>1</u>	<u>1</u>
* subtotal *	44	45
<u>*Batavia WPA</u>		
Mallard	27	28
Blue-winged teal	38	39
Wigeon	3	3
Shoveler	9	9
Redhead	15	16
Lesser scaup	2	2
Common goldeneye	1	1
Bufflehead	<u>1</u>	<u>1</u>
* subtotal *	96	99
<u>*Smith Lake WPA</u>		
Gadwall	3	3
Pintail	5	5
Green-winged teal	2	2
Blue-winged teal	55	57
Wigeon	19	20
Shoveler	6	6
Redhead	93	96
Ring-necked duck	3	3
Canvasback	24	25
Lesser scaup	15	15
Ruddy duck	9	9
Mallard	<u>97</u>	<u>100</u>
* subtotal *	331	341

Table VI. 1991 Duck Breeding-Pair Counts and Estimated Production for Flathead County WPA's (cont.)

Species	# Pairs	Production
<u>*Blasdel WPA</u>		
Gadwall	2	2
Pintail	1	1
Blue-winged teal	24	25
Wigeon	6	6
Shoveler	19	20
Redhead	27	28
Lesser scaup	8	8
Common goldeneye	4	4
Bufflehead	5	5
Ruddy duck	25	26
Mallard	13	13
* subtotal *	134	138
*** Total ***	605	623

Estimated production for all WPA's in the entire district was 1607; 32 percent below 1990 estimates.

Waterfowl populations on all WPA's continue to be monitored by aerial census flights and random ground counts done in conjunction with on-going work programs. Spring waterfowl populations peaked in March when nearly 12,000 birds were observed.

Fall waterfowl populations peaked in mid-October when an estimated 27,300 ducks, geese, and swans were observed. The majority of these birds left the area following an early winter storm in late October. Wetlands froze on October 29, thawed on several occasions during November and refroze for the year on December 18. As a result, fall waterfowl populations were limited to the more hardy mallards and Canada geese who utilized the open-water areas of the rivers and lakes. Total waterfowl-use-days for the district were estimated at 1,741,290; 10 percent below last year's estimates. Waterfowl population peaks are summarized in Tables VII and VIII.

Table VII. Peak Waterfowl Populations, Spring Migrations

	1985	1986	1987	1988	1989	1990	1991
Swans	150	1,300	650	250	500	250	600
Canada Geese	600	1,850	500	750	600	250	1,200
Ducks *	2,495	2,635	4,935	7,480	5,200	18,300	9,350

Table VIII. Peak Waterfowl Populations, Fall Migrations

	1985	1986	1987	1988	1989	1990	1991
Swans	15	91	115	140	125	350	250
Canada Geese	600	350	370	2,100	1,000	2,500	2,500
Ducks*	10,491	12,934	24,466	21,900	20,300	34,550	24,575

*Coot numbers are included.

4. Marsh and Water Birds

Great blue herons, American coots, pied-billed grebes and double crested cormorants were present during the spring. The coots and grebes nested on deeper units in the county. For the fourth year in a row at least one great egret was observed on Lake County wetlands. Birds in this category counted during duck pair counts on Lake County WPA's included 149 American coots, 10 eared grebes, 1 pied-billed grebe, 3 great blue herons and 7 double-crested cormorants. Four sandhill cranes were also observed during the duck brood counts in June at Sandmark WPA.

American bitterns, great blue herons, pied-billed, eared and horned grebes, and sora rails utilized all WPA's in Flathead County this year. Populations were monitored in conjunction with on-going field activities. Populations peaked in June, then again in August.

Three pairs of sandhill cranes were observed on Batavia WPA in April. The cranes were observed throughout the summer; however, nesting wasn't documented and no young "colts" were observed with the adults any time during the year.

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. Approximately 1,100 ring-billed gulls were observed on Flathead WPA in June. California gulls totaled 600 during the same month.

Shorebird numbers on Lake County WPA's were above average in 1991. Local wetlands were relatively low until this year, providing good mudflats for shorebirds. California and ring-billed gulls were observed near the WPA's on several occasions and are a result of a large nesting colony which has developed on Ninepipe NWR.

Birds tallied during the duck pair counts included 21 Wilson's phalaropes, 8 American avocets, 10 killdeer, 9 common snipe, 34 long-billed dowitchers, 4 black-necked stilts, and 20 unidentified sandpipers.

6. Raptors

During the year various raptors were observed either wintering or migrating through the WPA's. These included northern goshawk, northern harrier, red-tailed hawk, rough-legged hawk, osprey, golden eagle, bald eagle, great horned owl, short-eared owl, long-eared owl, peregrine falcon, gyrfalcon, merlin and kestrel. The Ninepipe area Christmas Bird Count was conducted in December. Raptors noted on that count included 4 golden eagles, 19 red-tailed hawks, 101 rough-legged hawks, 3 northern harriers, 3 prairie falcons, 1 gyrfalcon, 8 kestrels, 1 cooper's hawk, 2 sharp-shinned hawks, 4 northern goshawks and 2 merlin. These numbers

were nearly all lower than in 1990 and reflect the reduced prey base since the crash in microtus numbers.

Only ground nesting species of raptors used Lake County WPA's for nesting because there are no trees on these areas. Northern harriers and short-eared owls were not as abundant in 1991 after the crash in the vole population. There were 31 short-eared owl nests and 1 harrier nest found in the Wetland District this year.

The first osprey sighting in Flathead County was observed on April 8, approximately one week later than last year. Flathead WPA continues to attract a significant number of these birds each year. The birds generally arrive in early April 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. In 1991, 12 nests were counted on the WPA; production was estimated at 3,035 young. Other nesting species on the WPA's in Flathead County were northern harriers and short-eared owls.

7. Other Migratory Birds

Assistant Manager Washtak completed two mourning dove coo-count surveys again this year. The surveys are run in Flathead and Lincoln Counties, only 2 doves were observed on both routes this year. The low number can probably be attributed to cool, wet, weather throughout the month of May.

8. Game Mammals

Typically, whitetail deer were the most common big game animal observed on Flathead County WPA's this year. Aspen, willow, and cottonwood groves, as well as brushy areas on Batavia, Flathead, and Blasdel, continue to provide year-round habitat. Several does and fawns were observed again in the reed canary grass and DNC units on Blasdel 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 population on the WPA's are unknown, but may be as high as 100-150 animals.

9. Other Resident Wildlife

Fall pheasant population in Flathead County appeared to have lost some ground this year despite the fact that local populations weathered the winter months well, and State crow counts were relatively stable compared to last year's figures. The reason for the apparent decline during the fall may be attributed to cool temperatures and wet weather in May and June, which probably resulted in high chick mortality. No formal surveys are conducted on the WPA pheasant population, the apparent decline is based on fall observations and reports received by local hunters during this year's hunting season (Section H.8.).

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 appears to be self-sustaining.

15. Animal Control

Skunks were again controlled on Lake County WPA's in accordance with the operational Environmental Assessment prepared in 1988 and as part of a University of Montana graduate study (See Section D.5).

Predator control efforts on Flathead County WPA's were again directed at striped skunks on Blasdel WPA. Trapping was conducted from mid-March to early July. All trapping was done in conjunction with the on-going nest drag/predator control study on Lake County WPA's. In 1991, 20 skunks were caught in 1,601 trap nights for a catch rate of 1.25 skunks/100 trap nights. This was down from last year's rate of 2.16 skunks/100 trap nights. Only live traps, baited with sardines were used. Skunks caught in DNC units accounted for 70 percent of the total. The remaining skunks were caught in native prairie units. Trapping will continue for one more year to assess the effects on waterfowl production on the WPA.

Several complaints were received again this year from local landowners concerning depredating waterfowl. One individual who lives between Smith Lake and Batavia WPA's visited the Regional Office and also went the congressional route to express his dissatisfaction with

alleged depredating waterfowl. The individual made several demands of the FWS, 1) direct payment for alleged loss of grain crops; 2) FWS purchase of a portion of his land for the purpose of planting a "lure" crop; 3) direct payment to the individual for planting a "lure" crop; and 4) demands for "free" farm ground or hay land as payment for the alleged damage. After responding to the congressional and several discussions with the landowner, Animal Damage Control personnel were contacted. A zon gun was provided for his use. None of his demands were agreed to and the matter seemed to resolve itself since most birds left the area with the coming of early summer. We suspect the issue may arise again during the spring of 1992.

Other complaints were also turned over to Animal Damage Control personnel in Stevensville, MT. In each case a zon gun was provided to the landowner and this seemed to rectify the situation.

17. Disease Prevention and Control

In January, Assistant Manager Washtak investigated two waterfowl die-offs. One die-off was reported along the Flathead River, the other at the Columbia Falls Sewage Treatment Plant. Both die-offs resulted in about 20 dead mallards being collected. Several carcasses were sent to the Madison Health Lab for necropsies. In both cases emaciation was the cause of death. Heavy winter snows had covered all stubble fields in the county resulting in limited food sources for wintering waterfowl. Heavy snow cover also limited our efforts to determine the exact extent of the die-offs; we estimated up to 400 birds may have died.

H. PUBLIC USE

1. General

Most public use on Lake County WPA's was related to pheasant hunting, waterfowl hunting, bird watching and bird dog training, in that order. Public use has increased along with increases in WPA acreage. In 1991, there were an estimated 500 visits. This was a 25 percent increase from 1990 and reflects the recent acquisition of Johnson WPA.

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 very high use of the areas. The northern part of the Flathead Valley continues to attract hundreds of new residents each year, as a result both consumptive and non-consumptive uses will increase each year. Fishing visits on Smith Lake alone accounted for over 8,000 visits this year.

2. Outdoor Classrooms-Students

In August, Bio-Aid Paul Gelhar presented a waterfowl management program to 22 students from Fair-Mont-Egan School (Figure 22).



Figure 22. Bio-Aid Paul Gelhar talks to many eager, young "wildlifera" during one of this year's waterfowl management presentations.
RG 8/13/91

In April, Assistant Manager Washtak led a waterfowl identification tour for 25 high school biology students at Smith Lake WPA.

7. Other Interpretive Programs

Audubon's annual "Bird-a-Thon" survey was conducted in May again this year. Blasdel WPA was included in the survey zone, where a total of 143 species were recorded.

Assistant Manager Washtak presented a slide talk on "waterfowl management in the Flathead Valley" to 45 seventh and eighth grade students at Somers Elementary School in April of this year.

8. Hunting

The 1991 waterfowl season began with an early opener for Canada geese on September 28. Once again, mild weather conditions did appear to influence bird movement and hunter success. Flathead WPA received the most pressure with 14 of the 16 parties pass shooting, with very little luck. Many hunters in private pit blinds adjacent to and immediately north of the WPA did considerably better, several bag limits were checked by 10:00 a.m. The goose season remained open until December 30. Success was fair to good throughout the year as the more hearty birds stayed in the valley despite the onset of early winter weather in late October.

In 1991, the State of Montana split the duck season into three openers in an attempt to satisfy the majority of waterfowlers. Duck season opened on October 5. September and October's dry weather left most north valley potholes dry, therefore, hunting pressure was limited to the more permanent basins, Flathead River, and the lake's shoreline areas. The warm weather also resulted in a lack of "migrant" waterfowl moving through the valley, hence opening day success was limited. Mild, warm conditions existed throughout most of October, this fact kept hunter visits and success to a minimum for the remainder of the year. An early-season winter storm on October 25 left 6" of snow in the valley. Two days later, all wetlands were frozen and bird use was limited to open stretches of Flathead River and Lake. Re-thawing of wetlands within the County occurred several times in November. However, most birds quickly headed south during and shortly after the winter storm. Migrant populations from Alberta also overflowed the north end of the valley seeking warmer climates "down south". Duck season closed for the year on December 29, with little hunter activity.

The 1991 pheasant season opened on October 12. Blasdel WPA, which traditionally receives the heaviest pressure, had an estimated 43 percent fewer visits on opening day. Corresponding big game seasons in eastern Montana may have attributed to the decline. Most hunters had also scouted the WPA's prior to the opener and found few birds. Hunter success on opening day reflected this fact as no full bag limits were checked that day, or any other day during the season. Hunter visits and success remained low throughout the season.

Several reports were received this year of deer hunters harvesting whitetail does on Flathead WPA. The WPA lies within a State designated whitetail doe hunting district and up to three doe tags can be purchased for either archery or rifle season. Because of this, hunter use of the WPA has increased over the years. Hunter visits were estimated at 125 for the season; at least 6 does were taken during the rifle season. In addition, two bucks were known to have been harvested. The Refuge Officer also received a report that two cow elk and a calf were taken off the WPA; however, this was not confirmed by actual observation.

Hunting pressure on Lake County WPA's was down this year for the opening weekends of both duck and pheasant season. Hunter visits were estimated at 350. A few duck limits were checked, but some hunters checked bagged none. The vehicle count for the pheasant opener in the Ninepipe area was 169, down 28 percent from 1990. Check station records showed the harvest of pheasants only 50 percent of 1990.

9. Fishing

Smith Lake WPA continued as one of the most popular fishing spots for yellow perch in northwest Montana. During the winter and summer months, hundreds of fishermen were out trying their luck every day. The State of Montana estimated fishing visits at over 8,000 for the year. Success varies with the time of the year. In 1991, March and December proved to be the "hot" months, with the size of perch ranging from six to twelve inches.

On December 30, the local Lions Club held their annual "Sunriser" fishing derby at Smith Lake. Approximately 300 fisherman came out for the day. The mild weather conditions and plenty of fish activity made this year's

derby one of the most successful. Several buckets of "10-12 inchers" were taken home. One perch weighing in at just under 1.5 lbs. took first place.

10. Trapping

Trapping was permitted on all WPA's in accordance with State regulations. Flathead, Batavia and Smith Lake had the most visits. Muskrats continued to be the primary target, although two individuals attempted to trap beaver on Flathead WPA. All trappers were asked to voluntarily report their success, but no one did.

17. Law Enforcement

Assistant Manager Washtak conducted all patrol work in Flathead County again this year. Law enforcement efforts were concentrated primarily on patrolling the WPA's during the waterfowl and pheasant seasons, and investigating vehicle trespass and reports of stray dogs harassing waterfowl. Several citations were issued this year for general trespass and improper State hunting licenses. In addition, several reports of big game poaching were turned over to State Wardens, who successfully prosecuted the individuals.

I. EQUIPMENT AND FACILITIES

1. New Construction

In September, approximately 3/4 mile of new fence was constructed for the new access lane on Flathead WPA. A parking lot was also constructed, the lane was posted and a wooden bridge built over a borrow ditch to provide for hunter access. Steel gates were also installed at the lane entrance point.

Construction on Lake County WPA's included 1 mile of new fencing along the north and east boundaries of Kickinghorse WPA and removal of 1/4 mile of old fencing along the south side of the same area. In addition, 1 1/4 mile of new fencing was constructed on the south side of the new Johnson WPA.

2. Rehabilitation

In August, the shop/storage building was given a much needed new coat of paint (Figures 23 and 24).



Figure 23. The shop/storage building prior to painting. PG 8/6/91



Figure 24. The shop building after painting. The new paint improved the appearance of the building, as well as conforming its appearance with other buildings at the Fish and Wildlife Center. PG 8/20/91

In September, several trees were cleared in front of the shop to provide for additional parking and turn-around space and about 40 yards of rock were added to the area.

In January, approximately 700 yards of rip-rap were added to the demonstration dike along the north shore of Flathead WPA (Figures 25 & 26).



Figure 25. FERC relicensing requirements for Kerr Dam called for construction of a demonstration dike to assess the effectiveness of dikes in preventing erosion along the north shore area of the WPA. The dike was constructed in January of 1990 under a nationwide permit, which limited the amount of rip-rap. Wave action that summer proved that additional material was needed to properly assess the dike's effectiveness. In January, Montana Power Company added 700 yards of additional rip-rap. RW 1/8/91



Figure 26. A view of the dike after the additional rip-rap was added. Several surveys done later in the summer showed that the dike was "holding its own" against the lake's wave action. Preliminary plans which call for additional off-shore diking across the north end of the lake are currently "on hold" pending FERC's final approval of the mitigation plan. SB 1/91

Approximately 15 man-days were spent this year repairing boundary fences and wire gates on Smith Lake, Batavia, and Flathead WPA's.

4. Equipment Utilization and Replacement

In July, a new 4x4 Chevy, crew-cab pickup was received for use on north valley units. In August, we purchased a new 5-speed drill press for our shop use.

Because we do so much mowing of weeds, a new 9-foot sickle mower was purchased this year to complement the 8-foot mower purchased last year. Now that we have two complete tractor/mower units we will cover most of the weed infested areas that can be mowed each year.

J. OTHER ITEMS

Jon Malcolm continued to serve as Chairman of the Flathead Valley Canada Goose Committee. The Committee is an interagency effort designed to coordinate Canada goose management in the Flathead Valley.

Jon also served on the Flathead Fish and Wildlife Advisory Board. 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

Assistant Manager Bill West provided information on WPA's in Lake County, while Ray Washtak provided data for the units in Flathead County; Ray also assembled the report. Jon Malcolm provided editing and final review. Sharon Hooley and Sharol Birks of the Fish and Wildlife Center at Creston did the processing and final typing.

K. FEEDBACK

See the National Bison Range Report.

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1991

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 1991

Ray W. Smith
Refuge Manager

6-17-92
Date

Jon Malcolm
Project Leader

6/22/92
Date

Brenda W. Johnson
Refuge Supervisor Review

7/2/92
Date

William L. Todd
Regional Office Approval

6/30/92
Date

INTRODUCTION

The Swan River National Wildlife Refuge is located in northwest Montana, 38 miles southeast 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 consists of 1,568 acres, with an additional 210-acre Forest Service inholding that is managed under a Memorandum of Understanding. The Refuge lies in 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.

Objectives of the Refuge are to provide for waterfowl habitat and production and to provide for other migratory bird habitat. The Refuge also provides nesting sites for a pair of southern bald eagles and a variety of other avian species. In addition, deer, elk, moose, beaver, bobcat, and black bear 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

Heavy mountain snowpack resulted in extensive flooding of the Refuge again this year (Section F.2.).

Estimated duck production increased 259 percent; Canada goose production decreased 62 percent (Section G.3.).

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

End-of-the-year snow levels on the refuge were at an all-time low, (Section B.).

B. CLIMATIC CONDITIONS

In 1991 total snowfall amounted to only 86", well below last year's total of 150". Total precipitation was 20.21", 24 percent below the 12-year average. A high of 91 was recorded in August with a low of -14 occurring in January. Ice-out occurred on April 14; interior wetland units froze this year on October 29, thawed in mid-November and refroze in early December. 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. 1991 Climatic Data, Swan River National Wildlife Refuge

MONTH	TEMPERATURE		PRECIPITATION (INCHES)		SNOWFALL 1991
	HIGH	LOW	1991	12-YR AV.	
January	43°	-14°	2.25"	3.12"	22.5"
February	52°	14°	1.07"	2.54"	.5"
March	55°	6°	1.99"	2.06"	10.0"
April	71°	24°	.81"	1.49"	.5"
May	77°	26°	.62"	2.41"	.0"
June	81°	30°	3.30"	1.98"	.0"
July	90°	34°	.38"	1.57"	.0"
August	91°	38°	.12"	1.62"	.0"
September	83°	32°	.87"	1.59"	.0"
October	74°	0°	.83"	1.76"	8.5"
November	47°	- 6°	4.99"	2.98"	33.5"
December	44°	4°	2.98"	3.48"	10.5"
			20.21"	26.60"	86.0"

C. LAND ACQUISITION

1. Fee Title

Several coordination meetings concerning BPA/KERR acquisition and mitigation were attended again this year. Wetland and forested tracts surrounding the Refuge have been delineated for potential acquisition under the two mitigation programs. There was no land acquisition in 1991. Refer to the Wetland District Narrative for further information concerning the status of the two mitigation programs.

D. PLANNING

5. Research and Investigations

In April, a special use permit was issued to Bob Anderson, a graduate student at the University of Montana. Bob's work involved measuring stream flows and surface water levels on the Refuge and the adjacent Nature Conservancy Preserve. The purpose of the study is to determine the water regime on the preserve and the Refuge and its impact on the endangered plant Howelia aquatilis, which is found on the preserve. At year's end, Bob was assimilating his yearly data and had not submitted a report to this office.

E. ADMINISTRATION

The Swan River NWR is a satellite unit of the National Bison Range and is manned by the Refuge Manager located at the Creston Fisheries Center. Budgetary, administrative and operational functions are coordinated with the Project Leader at the Range. Refer to the Wetland District Narrative for administrative details.

6. Safety

Assistant Manager Washtak and Bio-aide Paul Gelhar completed an eight-hour Coast Guard Auxiliary Boating Safety Course on April 22. Subjects included boating safety, seamanship and navigational instruction.

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, Figure 1.



Figure 1. An aerial view of the alluvial floodplain which comprises 80 percent of the Refuge.
RW 4-3-86

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

Approximately 90 percent of the Refuge flooded again this year. Flooding generally occurs in April, May, and June when mountain snowpack begins to melt. Swan River, Bond Creek, Yew Creek, and Spring Creek are the principal tributaries which carry the heavy runoff. By

early July water levels in Swan Lake have risen sufficiently to result in additional flooding along the Refuge's shoreline. Water flows started to enter the Refuge in mid-May and continued into early August this year.

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 very wet soil conditions and the lack of a willing cooperator.

8. Haying

Despite several notices sent to local newspapers there were no "takers" for available reed canary grass hay units on the Refuge this year. Wet, boggy soil conditions over 70 percent 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 continued as the most persistent noxious weed found on the Refuge. Infestations were generally limited to elevated upland sites and the nesting islands located in the northwest portion of the Refuge. In 1991, high water levels apparently limited some thistle growth on areas normally infested. However, we still saw many densely infested areas. High water again limited our access for planned control purposes. Control was limited to pulling or hand chopping any plants that had "bolted".

In September, the parking lot near Bog Road was mowed to reduce annual weed growth and provide more suitable public access.

G. WILDLIFE

2. Endangered Species

The Swan/Mission Mountain Ranges have been designated as a "habitat corridor" of the endangered grizzly bear. The Montana Department of Fish, Wildlife, and Parks (MDFWP) continued studies this year to determine the status of the grizzly in the northern end of this range. No studies were made on the Refuge, but the area is excellent grizzly bear habitat. In 1991, no observations of grizzly bears or their sign were made on the Refuge.

The nesting pair of bald eagles returned to the Refuge again in early February. One eaglet was fledged in mid-July. The pair and young one were observed utilizing the Refuge and the surrounding area throughout the year, presumably feeding on waterfowl, fish, and rodents. In cooperation with State monitoring efforts, we recorded our monthly observations of the eagles and submitted annual bald eagle nesting forms.

In June, four other "transient" eagles were observed on the Refuge. These birds remained for about a month, then presumably moved to other locations within the Swan Valley.

3. Waterfowl

In 1991, observed duck pairs increased 65 percent when compared to 1990 (Table II). The reason for the increase may be attributed to reduced interior water levels in early May which provided more secure shallow oxbows and sloughs preferred by "paired up" waterfowl. This was in contrast to past years when early snowmelt and runoff created large, open water areas within the Refuge. When this occurred, it appeared most birds were "grouped up" in large flocks making it difficult to distinguish individual pairs.

Table II. Pair Count Data 1986 - 1991

SPECIES	1986	1987	1988	1989	1990	1991
Mallard	35	35	50	54	39	66
Cinnamon/BW teal	15	23	29	31	19	26
Common Goldeneye	5	15	19	30	0	25
Wood duck	1	3	0	3	5	10
Common merganser	4	1	3	8	2	0
Widgeon	0	5	0	3	0	2
Pintail	0	3	0	3	0	1
Ringneck	0	0	4	1	6	1
Barrows goldeneye	0	0	0	0	0	0
Shoveler	0	0	2	3	0	2
Bufflehead	0	1	0	0	11	1
Greenwing teal	0	0	3	0	0	0
Gadwall				1	0	0
Lesser Scamp				4	0	5
Hooded Merganser					3	1
Total	60	86	110	141	85	140

Duck production figures were calculated using a hen productivity rate of .39 based on nest searches conducted on Lake County WPA's. Using this productivity rate, an average brood size of 4.6, and a brood survival rate of .7, estimated production for 1991 came to 140, a 259 percent increase over 1990 production estimates (Table III).

Table III. Estimated Duck Production, 1983-1991 Swan River National Wildlife Refuge.

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Ducks	1005	*	244	150	172	91	147	39	140

* Duck production unknown, no surveys made.

The reason for the large increase in production was attributed to an increased number of pairs and an increased 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. This year, waterfowl populations peaked in March (spring migrations), Table IV and in October (fall migrations), Table V. Total waterfowl use-days this year were estimated at 231,120 a 6 percent decline from CY 90 estimates.

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

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Swans	20	40	0	16	100	136	180	150	100
Canada geese	350	300	223	75	150	150	205	400	150
Ducks	1270	136	920	367	215	535	2595	1650	5600

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

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Swans	20	37	10	10	35	36	*55	150	250
Canada geese	200	165	40	175	175	275	150	350	200
Ducks	1160	780	440	847	495	1086	550	2235	2550

*Observed in December

Canada goose production estimates are based on aerial pair counts done in April, followed by brood counts in early June. Documenting actual nesting on the Refuge continued to be difficult due to high water levels and general inaccessibility of the Refuge. In 1991 we searched all nesting islands and other elevated sites but could find no nests. In addition, none of the nesting structures on the Refuge were used.

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 which hatched within the Swan River/Lake system migrated 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, continue as our most accurate index of goose production in the Swan Lake/Refuge system. Some of this year's decrease in production was attributed to a 45 percent decrease in the number of observed pairs. Another reason for the decline was the possibility that we just could not locate the goose broods on that particular day of the flight or the fact that the broods were not on the Refuge at the time of the flight.

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

	1983	1984	1985	1986	1987	1988	1989	1990	1991
Breeding Pairs	13	23	15	40	32	25	34	42	23
Number of Young Observed	34	36	94	67	38	77	45	84	32

In May, several meetings were attended with the Swan Lake Chapter of the Audubon Society, MDFWP and other interest groups concerning an increase in boating traffic on Swan Lake which could impact American loon nesting along the shores of the Refuge and elsewhere on the lake. It was decided to increase efforts to locate loon nests and if found, clearly mark the nest area with buoys to further warn boaters. Although several loon calls were recorded this year on Spring Creek and along the northwest shoreline of the Refuge, no nests were located. In cooperation with these organizations we intend to continue our monitoring efforts in 1992.

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 appeared to peak in June when nearly 100 grebes, bitterns, herons, and soras were observed. Nesting probably occurred but was not documented this year.

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. In late May, we observed several killdeer nests adjacent to Spring Creek. Populations again peaked in July and August; use-days were estimated at 13,600.

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. Several red-tailed hawk nests were observed in the reed canary grass stands adjacent to Bog Road in late May.

8. Game Mammals

The Refuge provided excellent year-round habitat for many of the big game mammals found in the State of Montana. Moose, elk, and deer tracks were seen in most upland areas on the Refuge. In 1991, white-tailed deer were the most commonly observed species. Resident populations are estimated at 30-35. Fawning probably occurred, but was not documented. In late February, residents in Swan Lake reported seeing several small groups of wintering elk near forested tracts along the south edge of the Refuge.

10. Other Resident Wildlife

Coyotes, beaver, muskrat, and raccoons were observed on the Refuge this year. With the exception of muskrats, all observations were made on or near Swan River. Muskrats were commonly observed in Spring Creek borrow areas and oxbows in interior portions of the Refuge.

Prolific beaver activity also continued along the shoreline of Swan River this year. Old growth cottonwood trees were the beaver's favorite target. In 1991, several more large cottonwood trees were cut down along the shores of the river with some of them actually blocking the river until high flows carried them away.

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, we observed many large "swirls" within the creek indicating continued use of the area by spawning females. The Creek was again closed to fishermen as part of the annual Refuge closure from March 1 - July 1 (Section H.1.).

H. PUBLIC USE

1. General

Public use of the Refuge continued to be somewhat limited due to the Refuges' secluded, out-of-the-way location and annual flooding. In addition, the lack of interpretive routes, foot trails, and camping facilities further limits potential visits. As in past years, local residents of the town of Swan Lake and other nearby small rural communities who enjoy bird-watching, hiking, waterfowl hunting, and fishing accounted for the majority of consumptive and non-consumptive uses. However, in 1991, we saw what appeared to be an increase in general visitations. On several occasions in late summer we observed many cars parked in the parking lot with groups enjoying a nature walk down Bog Road. This increase in non-consumptive use may be attributed to the fact that in 1990 the Refuge was selected as a "Montana Wildlife Viewing Area".

7. Other Interpretative Programs

Interpretive programs presented again this year included several slide presentations (Figure 2) to local school groups concerning management topics involving both the Refuge and Wetland District. Refer to the Wetland District Narrative for specific information.



Figure 2. Bio-Aide Paul Gelhar talks to many eager, young "wildlifery" during one of this year's waterfowl management presentations.
RG 8/13/91

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. Non-toxic shot is required.

This year's waterfowl season began with an early opener for Canada geese on September 28. There were no hunter visits for the goose opener due to extremely mild and warm weather conditions.

The October 5 duck opener also brought limited activity to the Refuge as mild summer like weather continued into early October. An early winter storm on October 27 and Montana's split duck openers resulted in sporadic hunter use of the Refuge throughout the remainder of the season. A final freezeup in early December limited both bird and hunter activity to open stretches of Swan

River and the Lake's shoreline. Hunter visits this year were estimated at 250, a 56 percent increase from 1990 estimates.

9. Fishing

Fishing activity on the Refuge is limited to Spring Creek and the Swan River after the closure period. High water levels again limited fishing visits in the river and success was poor until late summer when water levels receded. 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 up-stream to spawn in the dense aquatic vegetation inside the Refuge boundary.

17. Law Enforcement

The Refuge was patrolled on opening day of waterfowl season this year. Several cases of "overbag" were made. Other patrol efforts in 1991 were made in conjunction with on-going work activities, including patrol of the Spring Creek access site. No other citations were issued this year. In January and February, several patrols were conducted in an attempt to control snowmobilers on the Refuge, however, no citations were issued.

I. EQUIPMENT AND CONSTRUCTION

4. Equipment Utilization and Replacement

All equipment utilized on the Refuge is also used in daily operations and work activities within the north valley WPA district; in 1991 no new equipment was purchased for exclusive use on the Refuge. Refer to the Wetland District Narrative for complete details.

J. OTHER ITEMS

4. Credits

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