NORTHWEST MONTANA WETLAND MANAGEMENT DISTRICT

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana
and
Moiese, Montana

1989

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ANNUAL NARRATIVE REPORT

Calendar Year 1989

U.S. Department of Interior

Fish & Wildlife Service

National Wildlife Refuge System

REVIEW AND APPROVALS

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Ray Prestbo — Refuge Manager — 2-15-90 — Date

Jon M. Malcolm — Project Leader — 3/25/90 — Date

Bonnie W. Schrank — Refuge Supervisor Review — 3/5/90 — Date

Regional Office Approval — 3/9/90 — Date

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 WPAs are located eight to nine miles northwest of the National Bison Range. The five WPA units; Duck Haven, Herak, Kickinghorse, Montgomery and Sandsmark, total 1,224 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 WPAs 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 WPAs.

Flathead WPA (2,370 acres) includes seven miles of 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 WPAs are located in the Smith Valley four and ten miles, respectively, west-southwest of Kalispell. Blasdel WPA is located approximately 1 1/2 miles north of Flathead Lake.

Flathead County WPAs are administered by the on-site Refuge Manager, who is headquartered at the Creston Fish and Wildlife Center, Creston, Montana (Sec. E.1.).

INTRODUCTION

TABLE OF CONTENTS

A. HIGHLIGHTS

The drought of the previous two years ended with a good moisture year. Total precipitation on Lake County units was 126 percent of average and it was the second wettest year on record for Flathead County areas (Section B).

An option was signed late in the year for FWS purchase of 1,549 acres of wetland and upland habitat in Lake County (Section C-1). FWS received permission to restore wetlands on 660 acres of CRP lands included in the purchase and work was completed in November on restoration/enhancement of 67 wetland basins (Section F-2).

Bonneville Power Administration continued study of plans to purchase approximately 400 acres of waterfowl mitigation habitat adjacent to Smith Lake WPA in Flathead County under the Northwest Power Planning Act. Ducks Unlimited carried out a feasibility study of potential marsh development on these same lands (Section C-3).

Ducks Unlimited also continued with planning and design of dike construction to enhance marsh pools at Batavia WPA in Flathead County (Section F-2).

Substantial progress was made on cooperative control of purple loosestrife on Federal, State, Tribal and private wetlands in Lake County (Section F-10).

Overall duck production for all units in the District increased by 98 percent from 1988 (Section G-3). Production on Flathead County units increased by 37 percent, but a major part of the overall increase was attributed to skunk control on Lake County WPAs where Mayfield nest success increased from about 19 percent in 1988 to 51 percent in 1989 and production increased by 119 percent (Sections D-5, G-3).

B. CLIMATIC CONDITIONS

In Flathead County, 1989 will be remembered for two notable weather events. Total precipitation was 22.20 inches, making 1989 the second wettest on record. Recorded precipitation was only .16 inches below the all-time high set in 1964, the year of great floods in northwestern Montana. And on January 31, a fast moving arctic cold front

dropped temperatures from a high of 44° to -8° in less than 24 hours. The arctic front brought winds of 50 mph which toppled trees, downed power lines and dropped the wind chill to -58°.

With the exception of a record cold of 42° on Memorial Day and a record high of 98° on July 31, the rest of the year was marked by generally mild weather conditions and near normal temperatures. Precipitation was above normal nine out of the twelve months with November's precipitation of 3.49 inches being 60 percent above average. Wetland conditions remained in excellent shape throughout the year.

Ice-out occurred on April 5; all wetlands were ice covered by November 28. At year's end, approximately 12-18 inches of snow covered most upland areas.

Table I. 1989 Climatic Data, Flathead County WPAs*

MONTH	TEMPERATURE HIGH	TEMPERATURE LOW	PRECIP.-INCHES 1989	PRECIP.-INCHES 30-YR AVG.	SNOWFALL-1989 INCHES
January	51	- 3	1.36	1.62	7.50
February	44	-20	1.32	1.06	18.75
March	49	-20	1.45	.84	6.00
April	77	20	1.25	1.06	
May	75	28	2.68	1.76	
June	85	37	1.47	2.24	
July	93	40	1.23	.94	
August	96	40	3.49	1.44	
September	80	29	1.55	1.11	
October	71	21	.90	.98	Trace
November	56	14	3.26	1.29	4.00
December	49	4	2.24	1.59	15.00
Totals			20.20	15.93	51.25

* Temperatures for Flathead County WPAs are recorded at the Northwest Montana Agricultural Research Center, Creston, Montana; precipitation figures are recorded at the US Weather Station at Glacier Park International Airport, Kalispell, MT.

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

C. LAND ACQUISITION

1. Fee Title

The size of the Wetland Management District continues to grow. A purchase agreement was negotiated on 1,549 acres in Lake County this year (Fig. 1). This is a very significant addition since there are numerous drained wetlands on the tract and 660 acres were recently set aside in the Conservation Reserve Program (CRP). The entire tract is owned by Jaye Johnson and the purchase takes the wetland and high potential waterfowl lands from the 4,100 acres that were up for sale. The purchase agreement allows FWS to close on the sale in early 1990 and Mr. Johnson will retain agricultural use for 1990-91. This purchase will bring the total WPA area in Lake County to 2,873 acres. Fee title land for WPAs in the District will total 7,331 acres.

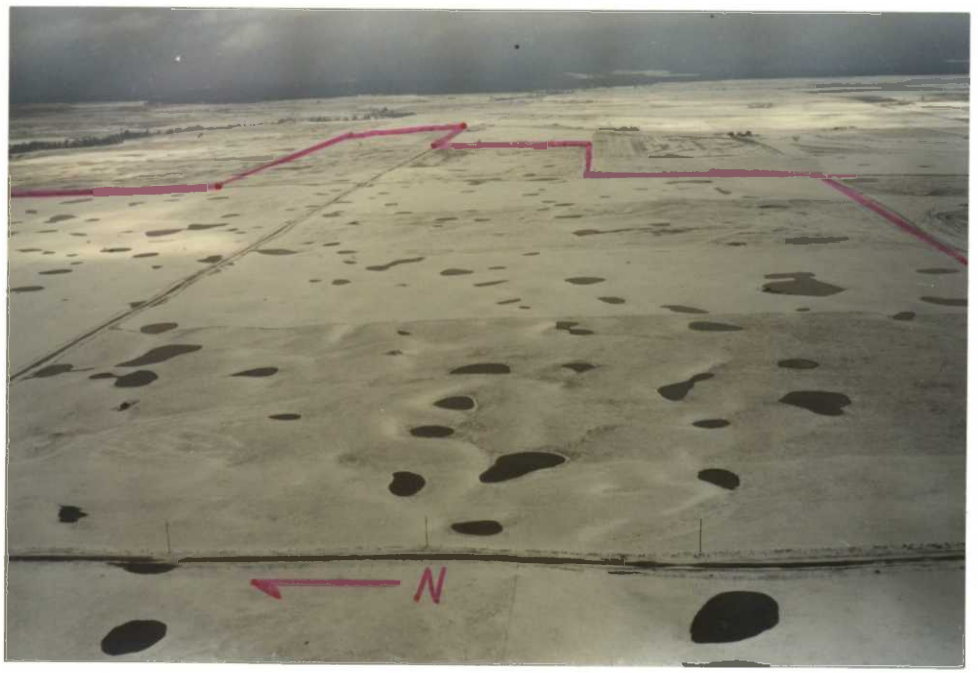


Figure 1. The CRP acres and small wetlands portion of a purchase of 1,549 acres in Lake County. There are several larger wetlands included in the purchase that are not visible in this photo. JJ 4/89

3. Other

It was not apparent that significant wetland drainage had occurred in the Flathead Valley until we began delineating wetlands on the above mentioned Johnson tract. Apparently, topographic maps of the area and aerial photographs used initially to identify wetlands were inadequate because drainage there had occurred prior to the 1960's. Mr. Johnson told us this year that his father had drained numerous wetlands on his lands in the 1950's. We confirmed this by obtaining 1937 and 1944 photographs of Lake County wetlands from the National Archives. Although both year's photos were late summer flights, there were numerous wetlands not visible on more recent photos.

Spring 1989 turned out to be relatively wet, so most areas of the District were flown and oblique photos were taken to aid in updating our small wetlands acquisition list for northwest Montana. These obliques and the archive photos resulted in several additions to the wetland list and the upgrading of Mr. Johnson's property to "high priority for purchase".

The small wetlands acquisition list for Flathead County was also revised this year with a total of 11,467 acres delineated. Additional wetlands in both counties were delineated for potential purchase or development as wildlife mitigation that is required by the 1980 Northwest Power Planning Act. This congressional act required mitigation for wildlife losses due to the construction of hydroelectric projects on the Columbia River system. In northwest Montana, wildlife losses have been attributed to two such projects; Hungry Horse Dam constructed in 1948 and Libby Dam constructed in 1968. A total of 4,569 acres has been established by the Montana Department of Fish, Wildlife and Parks and the Bonneville Power Administration (BPA) as a goal for waterfowl habitat restoration. Mitigation implementation is directed by the State in coordination with the FWS. Funding is the responsibility of BPA via ratepayer dollars.

This year Manager Malcolm, and Assistant Managers West and Washtak met with state biologists to review potential BPA acquisition tracts adjacent to Smith Lake WPA (Fig. 2).

Figure 2. In October, BPA allocated funds for a feasibility study of the acquisition parcels (outlined in blue). At year's end, the survey had been completed and soil testing was on-going. Ducks Unlimited reviewed the area in July and agreed to fund development costs (i.e. dikes water and control structures) depending on the outcome of the feasibility study. Note the excellent water levels. Present fee title lands are outlined in red. RW 5/10/89

Further mitigation planning and coordination for habitat losses in northwest Montana have involved those losses attributed to the operation of Kerr Dam. In 1989, Montana Power Company (MPC) began preparing the Kerr Dam Management Plan which is required as a condition of a Federal Energy Regulatory Commission (FERC) joint operating re-license. Operations of Kerr

Dam, located at the south end of Flathead Lake, have altered the natural seasonal lake level variations in the Lake. These operations have extended the season during which the Lake is at high pool from a pre-dam period of two weeks to a post-dam operating period of approximately three months. The sustained high water levels have resulted in the erosion of over 2,000 acres of riparian and wetland habitats on Flathead WPA. Negotiations with MPC for mitigation for these losses have been the responsibility of the Fish and Wildlife Enhancement Division at the Creston Office in coordination with Refuges. MPC has tentatively agreed to replace, through acquisition, 3,424 acres of wetlands in Flathead County. Acquisitions may begin in late 1990.

In response to continuing and immediate losses on the WPA, MPC prepared a draft Flathead Lake Shoreline Erosion Remedial Action Plan this year. This plan identifies three critical erosion areas on the WPA and calls for the construction of three temporary demonstration dikes to prevent further erosion in 1990. During the last three months of the year, Assistant Manager Washtak attended several coordination and planning meetings with MPC, State and local agencies. At year's end, the power company and their consultants had completed dike designs and most permit processes. Construction of the three demonstration dikes is expected to begin in mid-January 1990.

D. PLANNING

2. Management Plan

To comply with Washington office direction and to simplify future planning, a Station Plan was completed and approved in 1989. This document will serve as a base for any future planning and serves to unify the Wetland Management District and all lands under the direction of the National Bison Range.

The Plan includes a Background Statement and an Operating Statement for all lands managed by the Fish and Wildlife Service in northwest Montana. Individual Management Plans will be prepared on an as-needed basis.

4. Compliance with Environmental & Cultural Resource Mandates

The Montana State Historic Preservation Officer was contacted prior to initiating wetland restoration work on the Johnson property. That office concluded that there were no significant cultural resources on the construction sites. The Confederated Salish & Kootenai Tribes were also contacted prior to the wetland restoration work. Their Shoreline Protection Division reviewed the project. The review process used by the Tribes is similar to the Corps of Engineers' 404 process. Several branches of the Tribal government, along with State and Federal agencies, were notified of the project through their office and no concerns were raised. The Tribe issued a permit on November 9, and restoration began that day.

In March, the State Historical Preservation Office (SHPO) notified us that the barn located on Blasdel WPA may be eligible for listing on the National Register under criterion C. No further action was taken this year to list the barn on the National Register.

In April, Montana Power Company (MPC) completed contract archaeological inventory of three historic Indian sites on Flathead WPA. The work was done as part of MPC's requirement for the Federal Energy Regulatory Commission (FERC) joint operating re-license. Subsequent field investigations revealed that none of the three sites maintained sufficient integrity or information potential to qualify for listing on the National Register. MPC also attempted a cultural resource inventory of the three demonstration dike project sites on Flathead WPA in December. However, all three sites were inundated and could not be examined. However, Montana SHPO determined that since the areas were flooded for most of the year, further survey efforts were unnecessary as long as monitoring occurs during the project construction.

An environmental assessment was completed for exchange of a 6.5 acre easement road and .7 acres of fee title land on Flathead WPA for 2.9 acres of privately owned land. The proposed acquisition tract will be developed as an access road for administrative and public use to the WPA. At year's end the exchange was awaiting Congressional approval.

5. Research and Investigations

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

This was the fourth year of study on Lake County wetlands and waterfowl areas. In three previous years, Mr. Hall found Mayfield nest success of only 20.7 percent (1986-88). As a result, predator removal was initiated in 1988 and continued in 1989. There were 109 striped skunks removed from a 17-square-mile study area surrounding the Ninepipe NWR in 1988 and 77 were removed this year. The predator removal is part of a second study discussed later in this section (61540-42). The objective of this study was to determine if predator (skunk) removal would significantly increase upland duck nesting success.

First year results (1988) indicated 18.5 percent Mayfield nest success or no significant difference from 1986-87, when there was no predator removal. But in 1989, the Mayfield nest success of 44.3 percent (95 percent CI 35.7-54.9 percent) was significantly higher than the 20.7 percent average for the previous three years. A total of 138 usable nests were located on 675 acres, similar to the 128 in 1987 and 114 in 1988.

In a comparison area at Pablo NWR where there has been no predator control, only 28 nests were found on 300 acres and the sample size was marginal for a Mayfield nest success calculation. However, Mayfield nest success based on available data was calculated at 29 percent. The pair population at Pablo was essentially the same as 1988, and estimated production was up 37 percent. This compares with skunk removal areas, where pair populations were up 27 percent and estimated production increased by 119 percent. Thus it appears that skunk control the past two years has resulted in decreased skunk depredation and increased nest success in the removal area. Other factors that probably added to the improved success were improved wetland numbers and condition and improved growing conditions for grasslands. This apparently encouraged more duck re-nest attempts than in past years.

Other observations indicated that large numbers of migrating raven were having an adverse impact on nesting success during the month of May. Also, nesting areas near tree shelter belts were subjected to higher

avian depredation. This was most likely due to magpies which use the shelter belts for nesting.

Although Mr. Hall's study is near completion, we hope to continue predator removal and monitoring of nest success.

Ninepipe NR-88 - Striped Skunk Removal Program in the Flathead Valley. (61540-42). Denise Pengeroth, University of Montana.

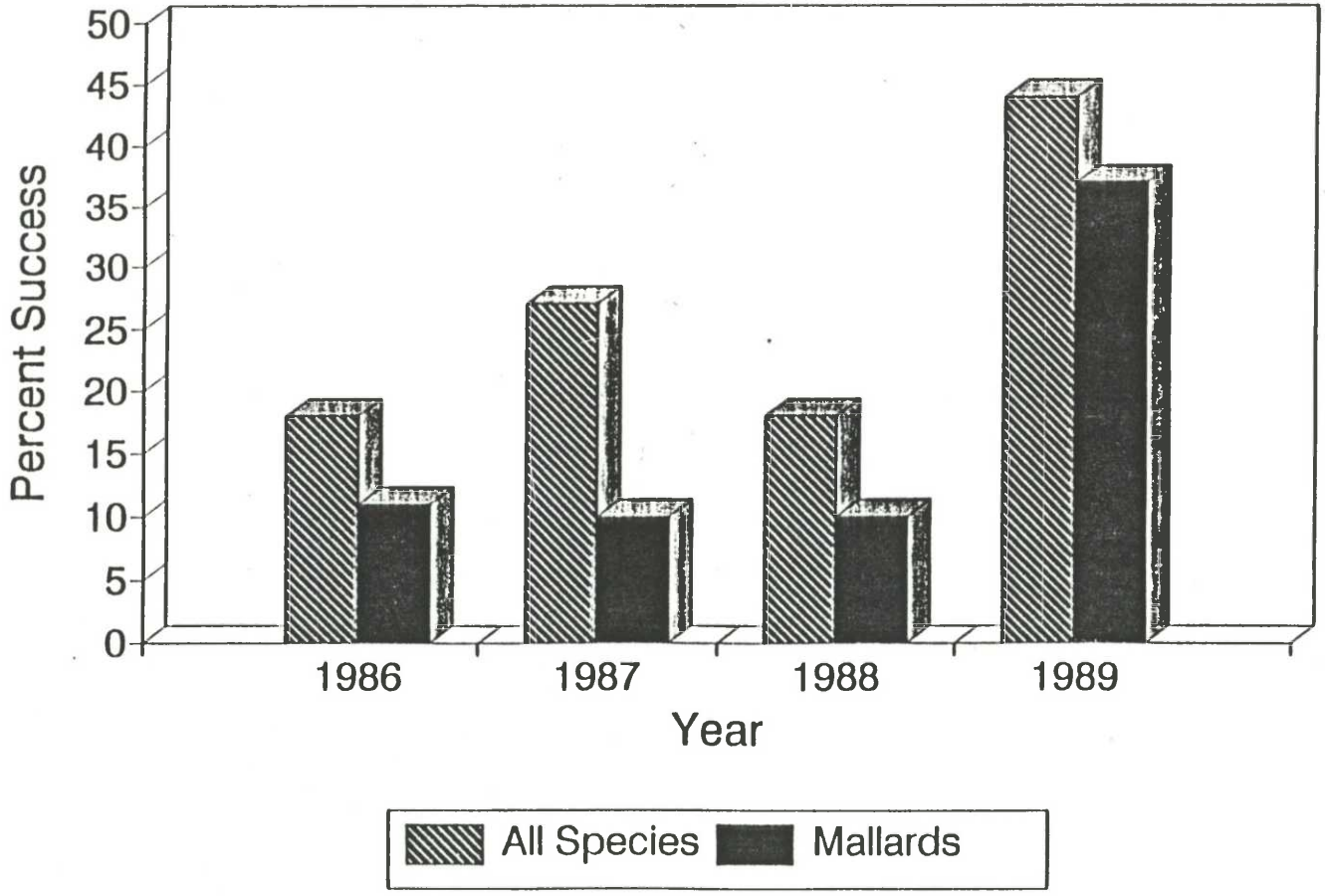
Results were 76 adults and one juvenile skunk captured between 21 March and 7 July, 1989. Up to 82 traps were used for a total of 7,372 trap nights. Trapping success for the period was 1.04 skunks/100 trap nights. This compared with 1.6/100 trap nights in 1988. As in 1988, trap success was greatest along ditchbanks where the predominant adjacent habitat was classified as dense nesting cover. Sets at this type of site accounted for 62 or 80.5 percent of the skunks caught.

Trapping began three weeks earlier this year on about March 20. This appeared to have improved trap success since animals were out by that time and baited traps were more attractive to animals that had few natural food sources available so early in the year.

Duck Nesting Success

at Ninepipe

(Includes 1988–9 Skunk Control Area Surrounding Ninepipe NWR in Lake Co.)



Duck Nesting Success

Ninepipe vs Pablo

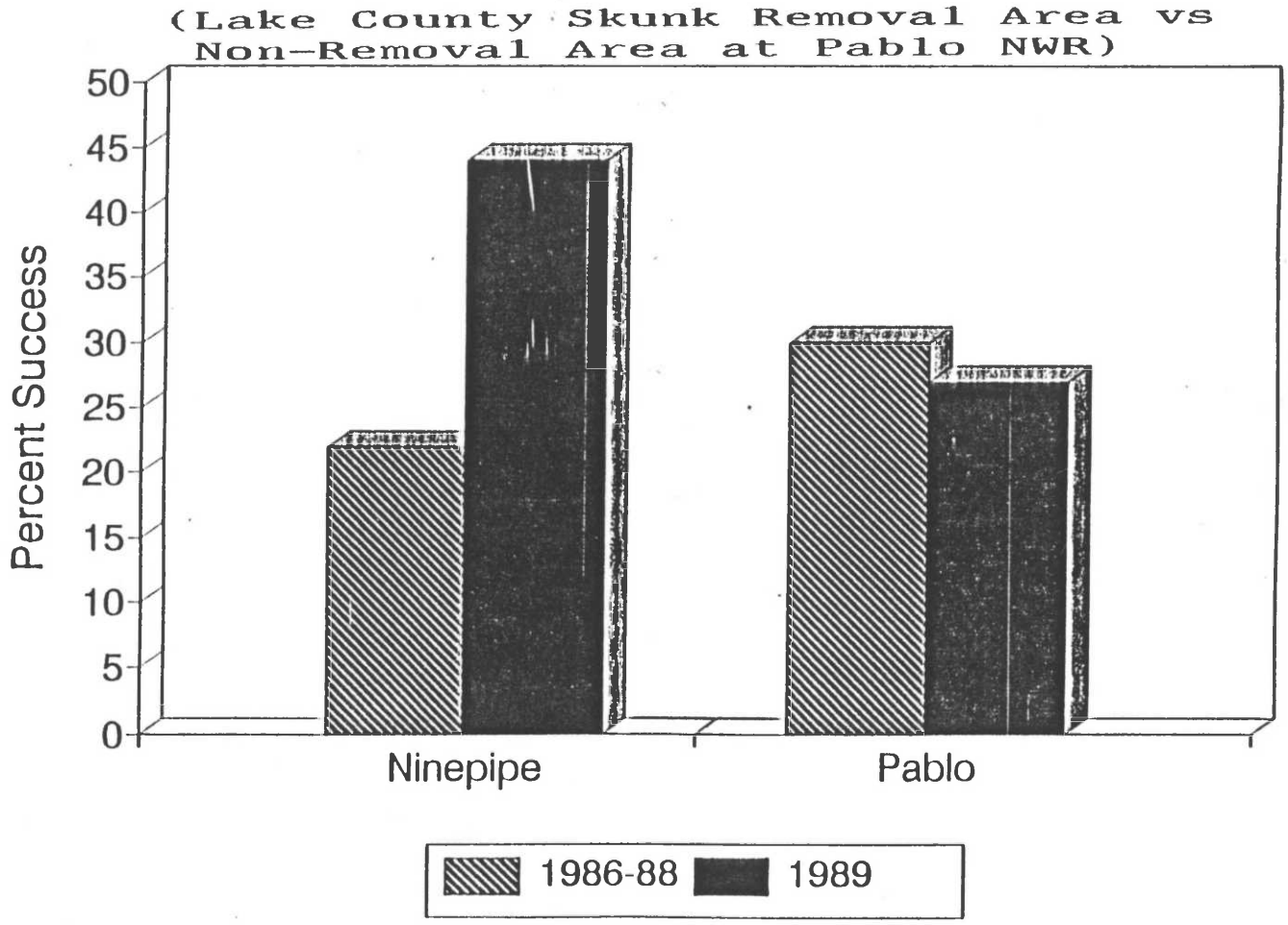


Figure 3. Skunks were captured in live traps which gave us the option to release nontarget animals unharmed. When skunks were captured they were euthanized by lethal injection of Sleep-Away, using a 10-foot pole. The skunks have not sprayed any employees using this method. BW 4/89

E. ADMINISTRATION

1. Personnel

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

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

On-site management and administration of WPAs in Flathead County is the responsibility of the Assistant Manager (Fig. 4), who is headquartered at the Creston Fish and Wildlife Center. The Center is located approximately 15 miles east of Kalispell and 71 miles north of the Bison Range. The Fish and Wildlife Center is the only FWS facility in Flathead County. Several other FWS divisions, including Fish and Wildlife Enhancement, Fish and Wildlife Assistance, and Hatcheries are also headquartered at the center.

Figure 4. Ray Washtak, on-site Assistant Manager for Flathead County WPAs. LL 1-11-90

On April 3, Mike Herman EOD as a biological technician - wildlife (Fig. 5).

Figure 5. Bio-tech Mike Herman. Mike's previous experience included a year as a volunteer with the district in 1988; his assistance this year included all phases of WMD and Refuge field operations and some administrative functions. RW 4/13/89

Daily clerical support for the Flathead County WPAs is provided by the Fish and Wildlife Center Administrative Assistant, while the Refuge Assistant at the Bison Range provides administrative support for detailed Refuge administration. Assistance provided by the Fish and Wildlife Center assistant and Refuge office space at the Center is provided on a cooperative reimbursable basis.

2. Youth Programs

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

4. Volunteer Program

The Flathead Resource Organization and the Flathead Chapter of the National Audubon Society volunteered 40 man-hours each, pulling and digging purple loosestrife in Lake County wetlands.

In May, James Babcock an 8th grade student at Cayuse Prairie School volunteered with nest drag operations on Blasdel WPA.

5. Funding

Operational funding for the entire Wetland District is included in the annual appropriation of the National Bison Range (NBR). Funding for WPAs in Flathead County is broken down separately based on annual work plan items as submitted by the Assistant Manager at Creston. For FY 90, approximately $63,500 has been tentatively allocated for the north valley WPAs and Swan River Refuge operations. Projected north valley funding for FY 90 represents a tentative eight percent decrease from FY 89 funding (Table II).

Table II. Annual Appropriations, Flathead County WPAs and Swan River National Wildlife Refuge.

FY	O & M	ADDITIONAL FUNDING
86	50,000	$12,000 (Small ARMMS)
87	50,000	$10,000 (Small ARMMS)
88	64,000	
89	68,100	
*90	63,500	

* Tentative appropriations.

6. Safety

The Station Safety plan was updated in 1989.

This year, all wetland staff members completed step tests, baseline hearing tests and Lyme disease blood screening.

7. Technical Assistance

Marcy Bishop of the National Bison Range Staff assisted Dr. B. Riley McClelland with the Glacier National Park Bald Eagle Project by monitoring radio-tagged eagles in the Flathead Valley. She also conducted a Mourning Dove Coo-Count in Sanders County and three Breeding Bird Surveys in Lake and Sanders Counties.

Lynn Clark judged 4-H exhibits in wildlife, range conservation and entomology at the Lake County Fair in Ronan. Ray Washtak served as a Science Fair judge for county elementary school exhibits in May.

Bill West worked with the Lake County SCS office on recommendations for seeding mixtures on CRP lands enrolled under "farmed wetlands" provisions of the 1985 Farm Bill. On several occasions this year, Assistant Manager Washtak also provided technical assistance to the local SCS office concerning cropping practices on Farm Bill lands in Flathead County.

Jon Malcolm and Bill West assisted the Confederated Salish & Kootenai Tribal Wildlife Biologist in determining the impact of Canada goose depredation on winter wheat fields in the Moiese Valley (Fig. 6). Subsequent meetings of the Flathead Valley Canada Goose Committee resulted in a recommendation to relax the restrictions on Canada goose hunting after Thanksgiving weekend. That recommendation was approved by the Tribal council. Hunters this year could harvest geese until January 1 west of Highway 93 and south of Sloan's Bridge. For the past 20 years this area had been closed to goose hunting after Thanksgiving weekend to protect wintering areas and allow for expansion of the flock. With that purpose accomplished the area closure was no longer deemed necessary.

Figure 6. The success of efforts to increase the Canada goose flock in the Flathead Valley became acutely apparent to several Moiese Valley winter wheat farmers. When most other areas are frozen the Flathead River is still open. Moiese wheatfields border the river and provide easy access to winter feed. BW 3/24/89

Figure 7. Several Moiese valley wheat farmers attempted to document damage to their crops in 1989. One farmer even sent the Bison Range a bill for $10,000. Subsequent actions to solve the problem included extending the Canada goose hunting season until December 31, rather than closing it the weekend after Thanksgiving. BW 3/24/89

In July, bio-tech Mike Herman assisted with banding Canada Geese on the Fort Belknap Indian Reservation in eastcentral Montana. The three day exercise resulted in 131 banded geese. The effort is part of continuing wildlife work being done by the Technical Assistance Division at Creston.

8. Other

Meetings and/or training attended this year included:

Washtak:
Several coordination and planning meetings with BIA, FWS, MDFWP and Forest Service biologists concerning BPA/Kerr mitigation, and proposed north shore erosion control projects.

Malcolm, West, Washtak:
The annual meeting of the Montana Wildlife Society Chapter and mid-year Project Leaders Meeting in Missoula.

Malcolm, West, Washtak:
The annual meeting of the Flathead Valley Canada Goose Committee meeting at NBR.

Malcolm, West, Washtak:
Annual work plan meeting - National Elk Refuge in September.

West, Washtak, King, Clark:
Annual L.E. re-certification - Marana, Arizona.

West, Washtak:
S-390 Fire Behavior Training - Denver, CO. March 6-10.

Washtak:
Three-hour Word Perfect computer seminar - Kalispell, May 16.

Bill West has been attending a training and public relations group known as Mission Valley Leaders in Action. This group meets once a month all day to learn about various aspects of the Mission Valley/Flathead Reservation. The meeting's goals are to improve communication between various interests, and provide skills and information necessary to deal effectively with community needs.

F. HABITAT MANAGEMENT

2. Wetlands

Potholes on Lake County WPAs were in good to excellent

shape after spring thaw and good conditions were maintained by timely and above average moisture. Although wetlands did dry to below average levels, conditions at year's end were still far better than in the past two years. There was abundant fall moisture. If the valley gets low temperatures needed to frost seal the ground and adequate snow, spring 1990 should have excellent run-off conditions.

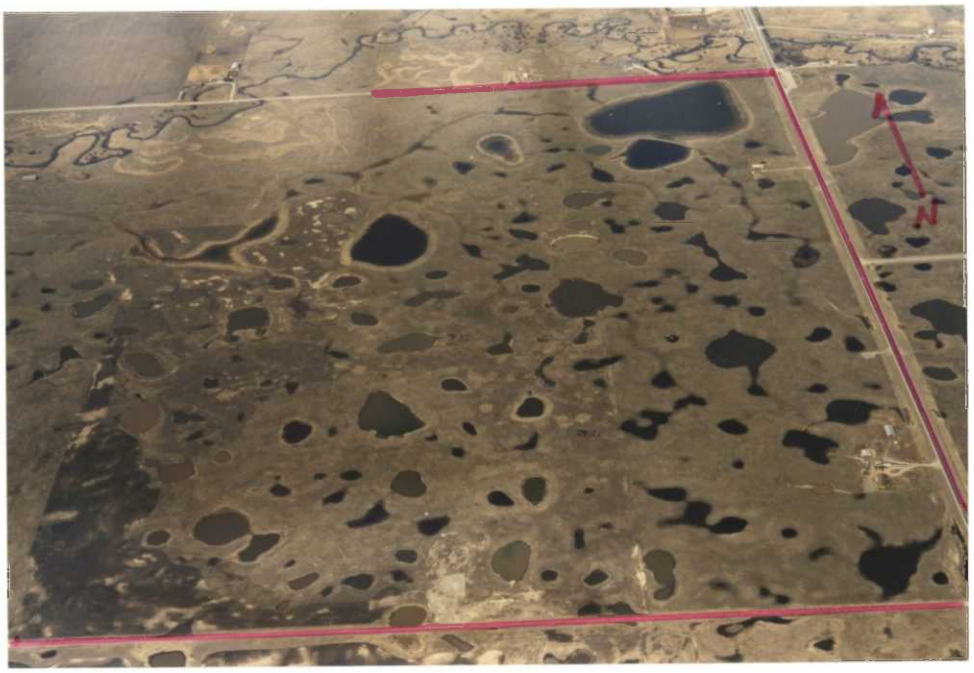


Figure 8. Wetlands made a dramatic recovery from the drought of 1987-1988. Water levels on Duck Haven WPA, in Lake County were in good to excellent shape. This oblique aerial photo taken in April 1989 has helped us identify drained wetlands on the WPA. Similar photos of private lands have identified areas of potential for landowner cooperation in wetland restoration.
BW 4/12/89

Several wetlands on Herak, Montgomery and Sandsmark WPAs were recharged with water from the Flathead Irrigation Project in late summer. Water diversion from irrigation canals allowed the filling of 13 potholes with approximately 40 acre-feet of water. Fall wildlife use of these wetlands was average to good.

A serious problem has been developing on wetlands in Lake County, namely the plant purple loosestrife. In 1988, active control was initiated by the Bison Range staff on both State, Tribal and private lands. The program was made possible by wildlife extension agreements with the landowners. The program was expanded in 1989 and FWS staff participated in a cooperative effort to control all Lake County infestations. An extensive review of the purple loosestrife problem in Lake County is in Section F.10. (Pest Control).

Wetland restoration was initiated on the 1,549-acre Johnson tract which was recently optioned for purchase by FWS. Mr. Johnson allowed the Bison Range staff to restore 67 wetlands on the 660 acres he has enrolled in CRP (Fig. 9). If everything goes as planned, this land will be in FWS ownership by early 1990. The work done this fall ensured that wetland basins drained in the 1950's will once again hold water if there is adequate run-off in 1990. Another segment of the wetland restoration involved routing water to the wetlands from their historical watershed. Mr. Johnson removed all culverts from under the county road, effectively routing water to Crow Creek through one major coulee. Five 18-inch culverts were placed under two county roads by the Lake County road crew (Fig. 10). This work was done at no cost to the Service since it was agreed to as mitigation for a road project near a wetland in another part of the county. At that site, the County will widen a road which will result in 100 square feet of wetland fill. The mitigation agreement was worked out by the Confederated Salish & Kootenai Tribes' Shoreline Protection Office at our suggestion.

Figure 9. Bison Range employees restored 67 small wetlands on property owned by Jaye Johnson. All wetlands are on lands enrolled in the CRP program of the 1985 Farm Bill. A purchase agreement was also completed on this parcel, with FWS ownership anticipated in early 1990. JM 11/13/89.

Figure 10. The Lake County road crew installed five 18-inch culverts under two roads through Jaye Johnson's property. This work was done as part of a mitigation agreement for wetland fill at another county road construction site. The culverts will restore natural drainage patterns to the wetlands on Mr. Johnson's property. JM 12/12/89

Spring wetland levels on Flathead County WPAs were excellent due to mountain runoff and above average precipitation. Ice-out occurred on April 5. Early warm weather resulted in a quick melt of remaining valley snows, and wetlands filled quickly. Batavia WPA required only nine days to divert 123 acre-feet to fill the three marsh pools. All hayed reed canary grass meadows surrounding Smith Lake were beginning to fill by mid-April (Fig. 11).

Figure 11. Smith Lake's wet meadows were half full by mid-April. Early spring mountain runoff and above average precipitation in 1989 resulted in excellent wetland conditions throughout the year in Flathead County. RW 4/14/89

In October, a small 0.5 acre Type I wetland on Blasdel WPA was restored. The restoration effort was coordinated with the Montana Department of Fish, Wildlife and Parks as mitigation for the filling of a small private wetland in the Swan Valley.

In May, Batavia was surveyed with the assistance of the Kalispell SCS office. Site gauges in the three marsh pools were "tied-in" with known elevations. Regional office hydrologists developed area/volume/elevation tables which are now used to determine diversion rates. The survey was prompted by claims from an adjacent landowner that water surface elevations on the WPA were

causing water related problems. Water complaints ranged from house shifting to rising groundwater. The complaint was turned over to Engineering Division in Denver. After examining past water management practices on the WPA, soils, groundwater levels, area elevations and potential infiltration rates it was determined that water elevations on Batavia were not the cause of any water problems on the private land.

Also in 1989, Ducks Unlimited completed a survey of Batavia. DU also submitted preliminary dike designs for rehabilitation of all existing interior dikes and water control structures. The proposed project will raise marsh elevations two feet; as a result, water diversion from Ashley Creek may take several days longer. Flood easements or land purchases will be needed on three tracts adjacent to the WPA to minimize potential flooding on private land. It is hoped that the easements/acquisitions can be formalized in early 1990 so that the project can proceed.

3. Forests

With the exception of Smith Lake, forested units on Flathead County WPAs are limited to approximately 25 acres of scattered willow, aspen and cottonwood stands. Batavia WPA contains about five acres of willow and aspen in the west marsh pool. There are approximately 80 acres of coniferous forests on Smith Lake WPA. These mountainous/forested units are located on the eastern side of the WPA and contain stands of larch, fir, spruce, cedar and pine. Flathead WPA contains approximately ten acres of riparian deciduous forests. Species include quaking aspen, black cottonwood, paper birch and several species of willow. All forested areas are maintained in their natural state.

In April, the Kalispell Chapter of Pheasants Forever assisted with planting a four-row shelterbelt on Blasdel WPA (Fig. 12).

Figure 12. Members of the local chapter of Pheasants Forever gather around the tree planter for an overview of it's operation prior to planting. All costs associated with the planting operation were provided by the Chapter. Species included chokecherry, American plum, and Nanking cherry. RW 4/22/89

4. Croplands

Cooperative farming occurred on 90 acres of cropland on Sandsmark and Montgomery WPAs in Lake County. The farming agreement will ultimately establish dense nesting cover, but there are extreme weed problems on these two units, so the ground was fallowed in 1989. There were no crops raised on FWS lands due to soggy wet ground and poor timing on the part of the cooperative farmer.

Plans are to plant 70 acres to a spring small grain in 1990, with DNC planted in fall as a dormant seeding. The 20 acres on Montgomery will be planted to alfalfa in spring 1990. In addition, 130 acres on the new Kickinghorse WPA was fallowed in 1989 with small grain and DNC to follow in 1990.

Whitetop (Cardaria spp) is the weed that has caused most of the frustrations on these units. Efforts to re-establish DNC on farming units have often resulted in weed infestations within a couple of years after planting. Last year the Regional Pesticide Review Committee denied the use of any herbicide for control of whitetop on these areas. We, therefore, had to rely on mowing to control whitetop on DNC units. Fallowing was the alternative method of control in ag units. If the 1989 efforts do not show some promise other chemicals such as 2,4-DB and MCPA may be tried. The new 20-acre alfalfa planting on Montgomery WPA will be mowed at times of the year most conducive to controlling whitetop and hopefully, the alfalfa will out-compete the weed. Such pure alfalfa stands have proven very attractive to ducks on the Pablo National Wildlife Refuge, ten miles north of these WPAs.

Approximately 60 acres in Units 7 and 8 were planted to barley by the cooperator on Blasdel this year. The farming agreement may be renewed annually to act as a lure crop as goose depredation complaints increased this year in Flathead County. The cooperator was allowed to use MCPA for weed control in 1989. Future farming will incorporate a summer fallow/barley/ legume rotation in an effort to reduce weed competition.

Other cropland acreage on north valley units includes 33 acres of DNC on Flathead WPA, 65 acres on Batavia, and 27 acres on Smith Lake.

5. Grasslands

Lake County WPA grasslands are composed primarily of quackgrass, Kentucky bluegrass and DNC plantings. Some of the earlier DNC plantings (1982) have severe weed problems. Whitetop invasion into DNC on Sandsmark WPA and coincidental lodging of vegetation has necessitated the clipping and subsequent fertilization of these plantings.

This weed problem is chronic and solutions will not come quickly. Current plans are to continue mowing and occasional fertilization. Some areas may have to be farmed to break the weed's growth cycle. We are attempting to control this weed without chemicals but have had little success so far (Sec. F.10.).

The Lake County Chapter of Pheasants Forever paid all costs to establish cover on a 17-acre field at Duck Haven WPA (Fig. 13).

Figure 13. Duck Haven WPA was purchased in 1988. Grasslands there showed a strong recovery in the first year under FWS ownership. Grazing practices under private ownership had left little habitat for ground nesting birds. Abundant residual cover will be available when nesting season begins in 1990. JM 9/5/89

Grassland units on Flathead County WPAs are dominated by reed canary grass, quackgrass, Kentucky bluegrass, creeping meadow foxtail, bluebunch wheatgrass, 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. Vegetative growth and mulch buildup are monitored through photo points and Robel readings taken each spring and fall.

In 1989, 55 acres of a grass/legume mix was planted in Unit 8 on Blasdel (Fig. 14).

Figure 14. The force account planting was done with the use of this rented air seeder. The rental cost was minimal at only $1.00/acre. The Kalispell Chapter of Pheasants Forever provided approximately $1200 for seed costs. The seed mix consisted of 2.0 lbs/ac. regal brome, 6.0 lbs/ac. intermediate wheatgrass, 2.0 lbs/ac spreader II alfalfa, and .5 lb/ac of sweet clover; all rates are P.L.S. RW 5/18/89

7. Grazing

An agreement was worked out with cooperator Kyle Salmonson to allow grazing on 240 acres of Sandsmark, Herak and Montgomery WPAs as payment for custom farm tillage at fields on the same areas. Three 80-acre fields were crowd-grazed for 10 days each by 100 cow/calf pairs, total 100 AUMs. The value of those AUMs was $800.00. Ninety acres were tilled two times and the AUMs were payment for that work.

In 1989, three permits were issued for grazing on Smith Lake. Table III summarizes this year's grazing treatments on the WPA.

Table III. Grazing treatments, Smith Lake WPA - 1989

Cooperator	Unit	Total use	Purpose
Kiser	4	28.0 AUMs	Open marsh units
Zimmerman	9	13.0 AUMs	Provide goose browse
Wood	8	7.5 AUMs	Provide goose browse

Units 8 & 9 were grazed with horses.

8. Haying

Reed canary grass meadows surrounding Smith Lake were hayed again this year. The meadows are mowed annually in order to provide additional pair habitat the following spring. Due to high water levels this year, the two cooperators were able to hay only 50 percent of their allotted acreage. Hay tonnage has averaged 1.5 tons/acre over the last five years. Fees assessed have been $5.00/acre. A fair market survey completed in October revealed that current assessed hay prices ($5.00/ac.) are too low. As a result all hay units will be put out for bids in 1990. Bids will be on an

acre basis only. Approximately 11 acres of reed canary grass in the Type I wetlands on Blasdel was hayed in October of this year. However, continued wet weather during the fall months forced the cooperator to leave the stumpage in the marsh.

Fifteen acres of DNC in the north half of Unit 1 on Flathead WPA were hayed by the cooperator this year. Purpose of the hay was to remove excessive mulch, restore vegetative vigor and provide weed control.

9. Fire Management

An abnormally heavy straw accumulation on Kickinghorse WPA was burned prior to tillage by the farm cooperator. The cooperator had been unable to get the material to incorporate into the soil for seed bed preparation, so an exception to a no-stubble-burning policy was made.

In cooperation with the Lake County Purple Loosestrife Committee, Bison Range staff burned off the vegetation on a private wetland in May to prepare the site for chemical control of the loosestrife in July (Fig. 15).

Figure 15. In cooperation with the Lake County Purple Loosestrife Committee, the Bison Range staff and equipment were used to burn cattails and purple loosestrife on a privately owned wetland. This reduced the residual vegetation prior to the spray season. The area was spot sprayed with 2,4-D one month later to kill the broadleaf weed. Any remaining loosestrife was spot sprayed with Rodeo in mid-August.
BW 5/12/89

Two prescribed burns were conducted on Flathead County WPAs this year. On April 19, 20 acres of the north half of Unit 2 on Smith Lake was burned. Vegetation was dominated by quackgrass, brome, Idaho fescue and bluebunch wheatgrass. The purpose of the burn was to improve vegetative vigor. The fire was declared out the same day with no smokes evident within the burned area. However, on June 30 the fire flared up in an underground peat pile. The area was excavated with the backhoe and extinguished the following day.

Forty acres in Unit 7 on Blasdel were also prescribed burned this year. The purpose of the burn was to remove and promote vegetative regrowth. Results were excellent and timely rains aided in a quick greenup.

10. Pest Control

Canada thistle remains the most persistent and common noxious weed on Flathead County WPAs. Infestations are widely scattered throughout the upland units making control difficult. Other noxious weeds include spotted knapweed and musk thistle. Knapweed infestations are limited to Batavia and Flathead, although a small infestation was discovered on Blasdel in June. Musk thistle is located in the upland units on Batavia and on the nesting islands.

In 1989, herbicide use on Flathead County was limited to cooperator use of MCPA for broadleaf weed control in 60 acres of spring-planted barley on Blasdel WPA. Total application was one pint A.E./ac. Future control efforts on this tract will incorporate a rotational farming scheme using summer fallow/barley/legume plantings.

A cooperative/contractual agreement was initiated this year with the Flathead County Weed Authority to control Canada thistle and spotted knapweed with Tordon 22K. Application was to have been by a tractor-mounted weed wipe. However, the County did not obtain a weed wipe in time to make effective treatments so no applications were made. As a result, force account efforts were directed at mowing thistle infestations that were most visible to the public. Two gas-powered Husqvarna weed eaters were also used to mow areas inaccessible to the tractor. Approximately 30 man-days were spent this year mowing Canada thistle infestations.

Stem mining weevil release sites were monitored for evidence of weevil activity and/or Canada thistle damage. The weevils apparently survived the winter of 88-89; some damage was noted but further monitoring is needed to determine the effectiveness of this biological control agent. On Batavia WPA, thistle head weevils (Rhinocyllus conicus) were transferred to the nesting islands for musk thistle control. In 1978, 800 of the weevils were released on the 310 acres of uplands. Results have been excellent but no movement of the weevil to the 26 nesting islands had been

observed in the last several years. The transplants and effects of the weevils will be closely monitored in 1990.

Small plots of spotted knapweed were hand pulled on Batavia, Smith Lake and Flathead WPAs. In past years, infestations had been limited to several parking lot areas. In 1989, 1-to-3 acre plots were observed on several upland sites. Additional controls will be needed in 1990 to prevent the spread of this prolific weed.

Known purple loosestrife infestations in Flathead County were monitored in 1989. Four of the locations are at local greenhouses or commercial gardens. All individuals were contacted and advised of the potential dangers of the plant. Local County weed supervisors inspected the one site on Ashley creek above Smith Lake where six of the plants were found in 1988. All six plants had been pulled by north valley personnel and their locations marked. No evidence of regrowth was found this year.

Weed problems on Lake County WPAs include spotted knapweed, Canada thistle and whitetop in grasslands and purple loosestrife in wetlands. Weed control in croplands was attempted by fallowing the ground three times in summer 1989. See section F.2. for an explanation of cropland management on Lake County WPAs.

Chemical weed control on grasslands was contracted to the Lake County Weed Office for the second year in a row. Cost was approximately $10.00/acre. Bison Range staff followed up by spraying and mowing odd patches of weeds missed by the County crew. The primary reason for chemical control is the lack of other effective methods which impact the spread of spotted knapweed.

National Bison Range personnel mowed 30 weed-infested acres on the WPAs near parking lots, and along roads and trails to control Canada thistle. In addition, 60 acres were mowed in a DNC field on Sandsmark WPA which was badly infested with whitetop. Table IV summarizes chemical use on Lake County WPAs.

Table IV. Herbicide use on Lake County WPAs in 1989

Target Species	Herbicide	Rate*	Acres	Application Method
Knapweed, whitetop, & thistle (Grassland)	2,4-D	1.9 lb/ acre	200	Ground-boom

* Pounds acid equivalent

Efforts to control purple loosestrife in wetlands were completed by the newly formed Lake County Purple Loosestrife Committee. Since this plant is located on State, Federal, Tribal and private lands, the Committee brought together all concerned groups. The groups included the Lake County Weed District, Fish and Wildlife Service, Montana Fish, Wildlife & Parks, Confederated Salish & Kootenai Tribes, The Flathead Resource Organization (an environmental group concerned about spraying herbicides), and the Flathead Chapter of The National Audubon Society.

Infestations at 50 different sites were treated with glyphosate (Rodeo) herbicide from mid-July to early September. A one percent solution was used at most sites with application by SOLO backpack sprayers. At two experimental sites 25 percent solutions of glyphosate were used with a wick applicator. There were about 100 infested acres in the county. Density of weed plants varies from one to solid stands.

Total chemical used in the effort was 15 5/16 gallons of Rodeo and 9 9/16 gallons of 2,4-D. Although 100 acres were infested, the actual acres treated were only 35 since most areas were not solid stands of loosestrife. Some areas were sprayed in July with 2,4-D and then spot sprayed in August with Rodeo.

In addition to chemical control, the Flathead Resource Organization, the local Audubon Chapter and Bison Range

staff dug up loosestrife at two sites totaling about two acres. This digging was on the Ninepipe National Wildlife Refuge on State Game Management land. In addition, the loosestrife committee clipped and removed 1/4 acre of the weed from a residential site along Spring Creek in Ronan.

History of the plant's expansion in Montana is sketchy, but, National Bison Range staff first became concerned about 1983 when a few collections were made in Lake County, near the city of Ronan. Subsequent discussions with area residents indicated the plant was well established as early as 1979. It appears the plant escaped from cultivation along the banks of Spring Creek and spread by water and wildlife.

Only two wetlands on FWS lands are currently contaminated, but the potential for habitat degradation is great (Fig. 16 & 17).

Figure 16. Wetlands on Sandsmark WPA in 1988 prior to control efforts. (Photo pt. #09-01A) BW 8/8/88

Figure 17. The same wetland (1989) after control of Purple loosestrife. (Photo pt. #09-01A) VK 8/10/89

The Loosestrife Committee's Plan for future control is:

1) Inventory and monitor, on an annual basis, the purple loosestrife in Lake County and determine the extent of infestation.

2) Increase public awareness of the weed and educate the public in identification and control.

3) Complete the existing five-year plan which should eradicate loosestrife from several sites and contain its future spread.

4) Coordinate control plans among all interested persons and groups.

5) Raise funding for control programs and environmental monitoring.

The committee prepared a control proposal and application for matching funds from the Montana Noxious Weed Trust Fund. Five local groups pledged a total of $7,800 per year for five years. A similar amount was requested from the State. The State provided $4,000.

Control plans for 1990 will follow guidelines developed in Minnesota and Wisconsin, where active control programs are in place. This will include digging the plant on FWS lands, since we now have organized groups interested in that type of donated help. Small areas will be spot-sprayed with Rodeo in August and larger areas will be sprayed with 2,4-D amine in July and a follow-up treatment with Rodeo will follow in August, if needed. Although 2,4-D may cause concerns near wetlands, its selectivity for broadleaf plants will, hopefully, allow monocot plants such as cattail to establish where the loosestrife has been eradicated.

11. Water Rights

The Fish and Wildlife Service is assessed a yearly fee for irrigation water and ditch maintenance by the Flathead Irrigation Project, regardless of the amount of water used. Water releases and diversions are made by personnel of the Project. This year's assessment totalled $7,255.90 or $15.18 per acre-foot of water for our quota of 478 acre-feet. This represents $1.09 decrease from last year's assessment. The reduction was related to reduced legal fees since the project chose to drop legal proceedings against the CSKT Tribes over control of Reservation water.

Water rights for Batavia and Smith Lake WPAs 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 pumping was not needed, but we plan to do some pumping in 1990. In 1989, 301 acre-feet were diverted from Ashley Creek into the three marsh pools on Batavia WPA.

G. WILDLIFE

2. Endangered and Threatened Species

Peregrine falcons are rare but consistent visitors to the lower Flathead Valley in the fall and early winter. Most sightings coincide with concentrations of ducks in the Moiese Valley. Bald eagles also concentrate in the lower Flathead in early winter. There were 43 bald eagles tallied on the 1989 Christmas Bird Count in the Ninepipe wetlands area. These numbers include some overlap of counts and the actual number was lower.

In 1989, only the east bald eagle nest on Flathead WPA was occupied. Both adults were seen in the vicinity of the west nest; however, no nesting occurred. Three eaglets hatched in May at the east nest site. Use of the WPA by migrating and/or transient bald eagles continued in 1989 with several other adults observed on numerous occasions. In October, seven adults and three immature bald eagles were observed on the WPA. In July, Montana Department of Fish, Wildlife and Parks' biologists released a rehabilitated immature bald eagle on the WPA.

From August through December another pair of adult bald eagles was observed on almost every trip to Smith Lake.

3. Waterfowl

Spring counts of Canada geese tallied 16 pairs on five Lake County WPAs and an estimated 60 goslings were produced. All artificial nesting structures and two small islands constructed on Duck Haven WPA were used. Fall goose-use of the WPAs was fair to poor due to lack of crop residues.

Goose pair counts on Flathead County WPAs revealed a total of 73 pairs, an increase of 48 percent from 1988 figures. Aerial brood counts in early June indicated that 27 goslings were produced at Smith Lake (Fig. 18).

Figure 18. Canada goose broods were first observed on Smith Lake in early May. Thirteen of the the nesting structures at the north end of the Lake were used this year, as well as one of the floating structures. RW 7/7/89

In past years, Flathead WPA has served as a traditional brood area for Canada geese with many broods often migrating to the WPA from nest sites along the Flathead River. Nest searches were not completed this year, but it is suspected that high water levels may have inundated most nests on the WPA nesting islands as well as ground nests along the Flathead River. Continued high water levels during the June brood count also dispersed broods from traditional brood sites; as a result, only 15 goslings were counted on the WPA during the June aerial survey.

Three of the six nesting structures on Blasdel were damaged by ice this year and were not used. The remaining three structures produced nine goslings. On

Batavia WPA four successful nests were located on the nesting islands. No goslings were observed during the aerial count. However, based on egg shell remains at the nest sites, an estimated 14 goslings were hatched on the WPA. Table V summarizes Canada goose production on Flathead County WPAs this year.

Table V. Canada goose production, Flathead County WPAs, 1989.

Unit	No. Pairs Observed	No. Goslings Observed
Batavia	7	14 *
Smith Lake	20	27
Flathead	32	15
Blasdel	14	11 **

* estimated production
** ground observation

Valley-wide aerial census revealed 851 breeding pairs of Canada geese, up about five percent from 1988. However, the aerial brood count tallied 1,024 young down 21 percent from last year. The brood count was hampered by abnormally high water and excellent emergent cover conditions in brood areas this year.

Duck breeding pair habitat was good to excellent on the WPAs in 1989. Above average snowpack and a fair frost seal created good runoff and abundant wetlands. There were 474 pairs of ducks tallied on Lake County WPAs, an increase of 27 percent over the 1988 pair counts.

Figure 19. This pair of cinnamon teal made an odd couple on a wetland near Kickinghorse WPA in Lake County. The albino female was observed several times on this wetland and she probably nested nearby. Maybe it's something in the water? RW 5/15/89

Duck production was estimated on Lake County units by multiplying the spring breeding pair count numbers by the average hen productivity, then multiplying by the average brood size which was 5.2 ducklings and finally multiplying by a 70 percent estimated survival of ducklings from brood count to fledgling. Although the average annual hen productivity is about 35 percent, results of nesting studies by Hall indicated hen productivity was much higher in 1989 at 62 percent. The following table summarizes this year's breeding pair and production numbers.

Table VI. 1989 duck breeding pair counts and estimated production for Lake County WPAs.

Species	# Pairs	Production
Montgomery WPA		
Mallard	11	24
Shoveler	2	4
Gadwall	2	4
Cinnamon Teal	2	4
Wigeon	1	2
Ring-necked duck	1	2
Blue-winged Teal	1	2
Redhead	1	2
Subtotal	21	44
Kickinghorse WPA		
Mallard	25	55
Gadwall	12	27
Cinnamon Teal	11	24
Blue-winged Teal	1	2
Redhead	2	4
Shoveler	8	18
Wigeon	5	11
Green-winged Teal	1	2
Pintail	5	11
Subtotal	70	154
Herak WPA		
Mallard	5	11
Cinnamon Teal	8	18
Redhead	7	15
Shoveler	8	18
Gadwall	3	7
Wigeon	2	4
Green-winged Teal	3	7
Blue-winged Teal	1	2
Bufflehead	1	2
Ruddy Duck	1	2
Subtotal	39	86

Table VI. continued

Species	# Pairs	Production
Sandsmark WPA		
Mallard	26	58
Pintail	5	11
Gadwall	8	18
Shoveler	26	58
Blue-winged Teal	5	11
Cinnamon Teal	25	55
Wigeon	2	4
Redhead	18	40
Green-winged Teal	1	2
Ruddy Duck	1	2
Subtotal	117	259
Duck Haven WPA		
Mallard	43	95
Redhead	28	62
Shoveler	36	80
Cinnamon Teal	34	75
Blue-winged Teal	14	31
Gadwall	33	73
Wigeon	13	29
Pintail	8	18
Green-winged Teal	8	18
Ruddy Duck	2	4
Bufflehead	1	2
Ring-necked Duck	2	4
Lesser Scaup	5	11
Subtotal	227	502
Total	474	1045

Total estimated duck production on Lake County WPAs was up 119 percent from 1988.

In Flathead County pair habitat was excellent due to above average precipitation. Aerial surveys in April indicated all permanent and semi-permanent basins were full. In addition, many previously unknown Type I potholes also filled resulting in a large dispersal of migrating waterfowl during the spring months.

Duck production on Flathead County WPAs was calculated in the same manner as on Lake County WPAs. In 1989, hen productivity was estimated at .35 based on nest drag results on Batavia and Blasdel. Only 25 nests were found on 650 acres of upland cover. Six nests had an unknown fate, 11 were predated and eight nests were successful, resulting in a apparent success rate of 32 percent. Pair count data and duck production estimates for Flathead County units are summarized in Table VII.

Table VII. 1989 duck breeding pair counts and estimated production for Flathead County WPAs.

Species	# Pairs	Production
Flathead WPA		
Mallard	10	13
Blue-winged/Cinnamon Teal	19	24
Redhead	2	3
Green-winged Teal	1	1
Lesser Scaup	2	3
Shoveler	7	9
Ringneck	1	1
Common Merganser	3	4
Subtotal	45	58
Batavia WPA		
Mallard	16	20
Blue-winged/Cinnamon Teal	28	36
Redhead	4	5
Lesser Scaup	1	1
Wigeon	1	1
Shoveler	7	9
Subtotal	57	72
Smith Lake WPA		
Mallard	24	31
Blue-winged/Cinnamon Teal	19	24
Redhead	19	24
Gadwall	1	1
Lesser Scaup	1	1
Wigeon	3	4
Shoveler	3	4
Ringneck	1	1
Ruddy	4	5
Wood Duck	1	1
Common Merganser	1	1
Subtotal	77	97

Table VII. continued

Species	# Pairs	Production
Blasdel WPA		
Mallard	8	10
Blue-winged/Cinnamon Teal	15	19
Redhead	15	19
Gadwall	2	3
Green-winged Teal	1	1
Lesser Scaup	1	1
Shoveler	4	5
Ringneck	1	1
C. Goldeneye	5	6
Ruddy	14	18
Barrow's Goldeneye	1	1
Subtotal	67	84
Total	246	311

Estimated production on Flathead County WPAs was 311 ducks, a 31 percent increase from 1988 estimates. Estimated production for the entire district was 1,356, 98 percent above 1988 estimates.

Waterfowl populations on all WPAs were monitored by aerial census flights, and random ground counts done in conjunction with on-going work programs. Spring waterfowl populations peaked in April when an estimated 6,300 birds were observed. Wetland conditions were excellent in the early spring. Continued above-average rainfall kept all wetlands nearly full through the summer months and into the fall.

Fall waterfowl populations peaked in October when an estimated 14,000 ducks and geese were observed. Fall wetland conditions remained in excellent condition, helped by 3.46 inches of rain in November. Freeze-up

occurred on November 28 restricting bird use to open water areas of the upper and lower Flathead River and Flathead Lake. Total waterfowl-use-days for the district were estimated at 1,983,480. Waterfowl population peaks are summarized in Tables VIII and IX.

Table VIII. Peak waterfowl populations, spring migrations.

	1983	1984	1985	1986	1987	1988	1989
Swans	1,600	500	150	1,300	650	250	500
Canada Geese	480	600	600	1,850	500	750	600
Ducks *	4,220	4,070	2,495	2,635	4,935	7,480	5,200

Table IX. Peak waterfowl populations, fall migrations.

	1983	1984	1985	1986	1987	1988	1989
Swans	50	74	15	91	115	140	125
Canada Geese	1,100	1,000	600	350	700	2,100	1,000
Ducks *	51,340	36,380	10,491	12,934	24,466	21,900	20,300

*Coot numbers are included.

4. Marsh and Water Birds

Two sandhill cranes were observed this fall on private land near Montgomery WPA. Great blue herons, American coots, pied-billed grebes and double crested cormorants were present during the spring on Lake County units.

The coots and grebes nested on most units. For the second year in a row at least one great egret was observed. Birds in this category, counted during duck pair counts on Lake County WPAs, included 60 American coots, four eared-grebes, seven Wilson's phalaropes, two great blue herons and one common snipe. American bitterns, great blue herons, pied-billed, eared and horned grebes and sora rails continued to utilize all WPAs in Flathead County this year. Populations were monitored in conjunction with on-going field activities. Populations appeared to have peaked in June then again in September.

Two pairs of sandhill cranes returned to Batavia in April for the third year in a row. Both pairs nested, however, no "colts" were produced, probably due to predation.

5. Shorebirds, Gulls, Terns & Allied Species

Bird species in this group that were observed this year on Flathead County WPAs included: spotted sandpipers, lesser yellowlegs, Wilson's phalaropes, dowitchers, snipe, avocets, ring-billed and California gulls. Flathead WPA held 300-to-400 gulls during the spring months, however, use of the WPA was limited this year due to earlier-than-normal high water levels.

Shorebird numbers on Lake County WPAs were lower in 1989, probably as a result of higher water levels and fewer mud flats around the wetlands. Local irrigation reservoirs were also higher this year, reducing the shorebird habitat. California and ring-billed gulls from the large nesting colony at Ninepipe NWR were observed near the WPAs on several occasions.

Birds tallied during the duck pair counts included five American avocets, two killdeer, and one greater yellowlegs.

6. Raptors

During the year, various raptors were observed either wintering or migrating through the WPAs. These included northern goshawk, northern harrier, red-tailed hawk, rough-legged hawk, osprey, golden eagle, bald eagle, great horned owl, short-eared owl, peregrine falcon, and kestrel.

Flathead WPA attracts a significant number of ospreys 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 used as nest sites each year (Fig. 20).

Figure 20. In 1989, 22 osprey nests were counted. This nest, located on a cottonwood stump on the Delta Island produced three young. An estimated 32 ospreys were produced on the WPA this year. RW 7/6/89

Other nesting species on the WPAs in both Flathead and Lake Counties were the northern harrier and the short-eared owl.

7. Other Migratory Birds

Three mourning dove coo-count surveys were completed again this year. One survey was run in the lower

valley area of Flathead County; the other, in Lincoln County, ends near the Canadian border north of Eureka, MT. In 1989, only three doves were observed on the Flathead and Lincoln County routes. Annual use of the WPAs is limited, probably due to generally cool nights that prevail throughout the summer months. Small groups of doves were observed on Blasdel in July of this year.

Marcy Bishop of the National Bison Range staff conducted the coo-count in Sanders County between Plains and Hot Springs. In 1989, 31 doves were either heard or seen, a 64 percent decrease from 1988 figures. The reason for the decrease is unknown.

8. Game Mammals

In 1989, whitetail deer continued to be the most common big game animal observed on Flathead County WPAs. Aspen, willow and cottonwood groves, as well as brushy areas on Batavia, Flathead and Blasdel provided excellent year-round habitat. Dense cattail stands along the shoreline of Flathead WPA continued to provide excellent winter habitat. Mountainous, forested units on Smith have been designated by the State as winter range for the whitetails. In August, whitetail does with very young fawns were observed on Smith Lake, Blasdel and Batavia on nearly every visit.

A lone cow moose was also observed on Batavia WPA on August 15. An adjacent neighbor also observed a bull near the north fence line of Unit 3 two days later.

10. Other Resident Wildlife

Pheasant populations in Flathead County continued their apparent increase this year. During the spring and early summer months, pheasants were observed on every trip to the WPAs. Blasdel and Flathead WPAs appeared to be supporting the greatest number of birds based on crow calls heard and observations made. Excellent stands of DNC on Blasdel along with brushy areas and dense stands of cattails on Flathead provide nesting, loafing and cover sites. Populations were estimated at 200-to-225 birds.

11. Fishery Resources

As in past years, Smith Lake WPA continued to support an excellent population of yellow perch. Since the waters of Smith Lake are claimed by the State, management of the fisheries resource is the responsibility of the State of Montana Department of Fish, Wildlife and Parks. No management was applied this year and it is suspected that the perch population is self-sustaining and will need no management in years to come.

15. Animal Control

Skunks were controlled on Lake County WPAs as part of two University of Montana graduate studies, (see Section D-5).

Predator control efforts in Flathead County were limited to Blasdel WPA. All trapping efforts were done force account and were directed at striped skunks. Trapping was initiated on March 29. Conibear 220 cubby sets and Tomahawk live traps were used. All Conibears were pulled on May 10 due to non-target specie captures, (i.e., cats) and subsequent concern expressed by adjacent neighbors. Trap density averaged 1 trap/47 acres. Thirty-eight skunks were trapped for a catch rate of 2.87 skunks/100 trap nights. Traps located within or adjacent to DNC yielded 24 of the 38 skunks caught. Catch rates were highest during the first three weeks and again in mid-June. Trapping ended on July 8.

On two occasions this year, a zon gun was provided to assist landowners near Flathead WPA in hazing Canada geese out of barley stubble fields.

H. PUBLIC USE

1. General

ESPN cable television did a half-hour segment of their American Wilderness program on the National Bison Range and associated lands. A portion of that program was on the wetlands complex surrounding Ninepipe National Wildlife Refuge. Many of these wetlands are a part of FWS-owned WPAs.

2. Outdoor Classroom-Students

In April, Bio-Tech Mike Herman participated in "Greenwing Day" at Smith Lake (Fig. 21).

Figure 21. Fifteen "Greenwingers" inspected nest boxes and goose structures for evidence of eggs and incubation stages. Results revealed 14 goose nests, two wood duck and one common goldeneye nest. MH 4/22/89

Figure 22. In May, Assistant Manager Washtak conducted a tour of Blasdel for twenty 6th, 7th and 8th grade science students from Cayuse Prairie School. RW 5/11/89

7. Other Interpretive Programs

In April, Mike Herman presented a slide talk on waterfowl management to local scoutmasters.

Also in April, Assistant Manager Washtak met with Flathead Wildlife, Inc., a local sportsmen's club, to discuss wetland issues and waterfowl management in the north valley area. In June, the club provided materials and labor to construct an interpretive sign for Smith Lake, Figure 23.

Figure 23. Smith Lake receives heavy fishing pressure year-round. In past years, fishermen with their domestic pets, have caused some disturbance to nesting Canada geese. Since the State of Montana did not agree to a temporary closure, the sign was installed as a reminder to all fishermen. In 1989, goose production rose 80 percent over the previous 5-year-average. The number of pairs did not change significantly over the same period. RW 6/11/89

8. Hunting

This year's waterfowl season began with an early opener for Canada geese on September 30, followed by the duck opener on October 8. Hunting pressure for the goose opener was light. Success was poor on the WPAs, but good in private stubble fields throughout the north valley area. Duck populations were excellent for the duck opener, resulting in moderate to heavy opening day pressure. Blasdel, Flathead and Smith Lake received the most visits. Success was fair to good, with several limits bagged on Smith Lake. Hunting pressure was light but steady throughout the remainder of the season. The duck season closed on November 26. Freeze-up on the 28th pushed remaining birds to the Flathead River and Flathead Lake. The duck season re-opened again on December 23 and closed for the year on December 31. Pressure was light during the last week. Goose season also closed on December 31. Waterfowl hunter visits on the WPAs were estimated at 1,080, a 31 percent increase from 1988 estimates.

Pheasant hunting in Flathead County continued to improve this year. Blasdel WPA was the most popular hunting area in the County. Pressure was heavy, with 34 hunters counted at daylight. Success was good and all hunters contacted indicated they "should have" gotten their birds. Pheasant hunting visits this year were estimated at 525, resulting in an estimated 1,575 activity hours.

Hunting pressure on Lake County WPAs was moderate to high the first weekend of goose, duck and pheasant seasons.

All Flathead County WPAs were open to big-game hunting. Batavia, Blasdel, Flathead and the marsh units on Smith Lake lie within a state-designated "shotgun/archery only" zone. Several does and two bucks were harvested this year on Flathead and Smith Lake.

9. Fishing

Smith Lake WPA continues to be one of the most popular fishing spots in northwest Montana. During the winter or summer months, many fishermen are out trying their luck every day. The State of Montana estimates fishing visits at 8000/year. In 1989, success varied from day to day with the best catches recorded during the months of March and October.

On December 30, the local Lions Club held their annual "Sunriser" fishing derby at Smith Lake. A crowd of about 125 people participated. Success was fair. The majority of perch caught were under eight inches.

Flathead Lake offers excellent bull trout and lake trout fishing. In May, bull trout migrate up the Flathead River to traditional spawning areas in the North Fork and Middle Fork tributaries 25-35 miles upriver. As a result, fishermen will congregate at the mouth of the river adjacent to the WPA. In 1989, as many as 18 boats were counted in or near the river's mouth on a single day. Success was excellent.

In May, a 27-year-old Ferndale man drowned at the mouth of the Flathead River. A sudden wind storm capsized his 14' boat before he could reach shore. A companion swam to safety. His body had not been recovered at year's end.

10. Trapping

Trapping was permitted on all WPAs in accordance with State regulations. Flathead, Batavia and Smith Lake received the most visits. Muskrats were the primary target. In December, several calls were received by individuals wanting to trap coyote and red fox at Smith. All trappers were asked to voluntarily report their success; however, at year's end no one had "checked in".

17. Law Enforcement

Law enforcement efforts were concentrated primarily on patrolling the WPAs during the waterfowl and pheasant seasons. Assistant Manager Washtak conducted all patrol work in Flathead County. Enforcement efforts on Lake County WPAs were handled by the Bison Range staff. No citations were issued this year in Flathead County; however, several complaints of late shooting were investigated. Off-road travel and vehicle trespass continued to be a problem this year in Flathead County. Several instances of 4-wheel ATV and snowmobile trespass were observed. This has been a recurring annual problem due primarily to the large population base in Kalispell and the surrounding countryside. All instances were investigated, however, no citations were issued because of the difficulty in making a case hold up in court "after the fact".

I. EQUIPMENT AND FACILITIES

1. New Construction

Construction on Lake County WPAs included the plugging of two ditches on Duck Haven WPA to restore drained wetlands. Also, two rock pile islands were constructed on the same area to replace Canada goose nesting baskets. The islands will not need annual maintenance and should provide an aesthetic alternative to the baskets. Both islands had successful goose nests on them in 1989.

In March, four pilings were installed along the west boundary of Flathead WPA (Figures 24 and 25).

Figure 24. After a two-year delay due to weather conditions and lack of a suitable contractor, the four pilings were installed along the west boundary of the WPA. The pilings will provide a more permanent boundary marker. RW 3/22/89

Figure 25. In mid-April, wooden nesting structures and WPA boundary signs were placed on the pilings. Two of the structures were used by ospreys and one was used by a nesting pair of Canada geese. Note the expanse of mudflats in the early spring months. By mid-June, water levels will be 2-3 feet deep near the shoreline. RW 4/11/89

In September, a 10' x 20' lean-to was built adjacent to the equipment shed at Creston. The additional space is used to store Refuge equipment and materials for Flathead County operations. A pick-up loading ramp was also constructed at the Creston sub-station.

Figure 26. In an effort to save money when posting fee lands in Lake County the maintenance staff came up with this design. BW 7/19/89

Figure 27. This method requires only one post to mark corners. We had 50 corners to mark with an average cost per post of $10.00. Approximate savings on Lake County WPAs was $500. BW 7/19/89

2. Rehabilitation

Approximately 15 man-days were spent rehabing fence lines and wire gates on Smith Lake, Batavia and Flathead WPAs. In addition, several large H-braces were replaced in boundary fence lines on Smith Lake.

In July, two short stretches of interior fence were pulled on Blasdel (Unit 8) and Batavia (Unit 3).

4. Equipment Utilization and Replacement

A used payloader was acquired from BLM in Coos Bay, Oregon for $5,000.00. It has quickly become one of the most used pieces of equipment on the Lake County units. It was used to restore wetlands on the new Johnson Tract and on Duck Haven WPA.

The National Bison Range has a good working relationship with the Flathead Irrigation Project and we occasionally borrow each others equipment. In 1989, we borrowed a nearly new, small Case dozer to move dirt for restoring drained wetlands.

Equipment utilization and replacement at the Creston sub-station included; 1) a surplus 14-foot boat, trailer and 25-hp outboard from Seedskadee Refuge; 2) a 40-hp Ford tractor with a 7-foot sickle bar mower from Arrowwood (used for weed control); 3) FWE division provided funds for purchase of a gas welder and 2-hp mobile air compressor; and 4) a surplus table saw was received from National Elk Refuge in September.

5. Communications Systems

In October, a 40-watt, Yaesu mobile radio was installed in the 4 x 4 pickup at the Creston sub-station. The radio was a much needed item for effective communication during law enforcement patrols.

6. Computer Systems

Nearly the entire staff at the Bison Range is now on line with personal computers. There are two desktop models and one laptop model in the office. All are 286 AT compatible Zenith computers. A power saver/surge protection device was purchased this year to protect the two desktops. In addition, the Creston Office also received a Zenith Model 286 laptop computer and Toshiba P341SL printer for use on Flathead County units.

Marcy Bishop, Lynn Clark, Gavin Gensmer, Bill West and Ray Washtak attended community courses in computer use to update their skills.

J. OTHER ITEMS

1. Cooperative Programs

In 1989, Jon Malcolm continued to serve as Chairman of the Flathead Valley Canada Goose Committee. The Committee is an interagency effort to coordinate Canada goose management in the Flathead Valley. Members include representatives from FWS, Montana Department of Fish, Wildlife and Parks, BIA and the Confederated Salish and Kootenai Tribes. The committee has no formal regulatory authority, but it serves to coordinate management efforts by the various agencies, and its recommendations are considered by those who set annual hunting regulations.

4. Credits

Information and data for Lake County WPAs was provided by Assistant Manager West. Data for Flathead County WPAs was provided by Assistant Manager Washtak, who also assembled the report. Sharon Hooley and Sharol Birks of the Creston Fish and Wildlife Center typed/proofed it and Jon Malcolm provided editing and final review.

K. FEEDBACK

See National Bison Range Report.

SWAN RIVER NATIONAL WILDLIFE REFUGE

Kalispell, Montana

ANNUAL NARRATIVE REPORT

Calendar Year 1989

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 1989

Ray Vosler — Refuge Manager
2-15-90 — Date
Jon M. Malcolm — Project Leader
2/25/90 — Date

_____ Refuge Supervisor Review _____ Date

_____ Regional Office Approval _____ 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, (Figure 1).

Figure 1. The Swan Valley offers a tranquil and peaceful setting. The Refuge lies at the south end of Swan Lake. This view looks to the south over the majority of the Refuge's floodplain. The 1,009,356-acre Bob Marshall Wilderness area is located beyond the Swan Mountain Range, which is in the left background. RM 8/81

Swan River National Wildlife 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.

INTRODUCTION

TABLE OF CONTENTS

A. HIGHLIGHTS

Flood water levels on the Refuge were at a five-year high, (Section F.2.).

Estimated duck production increased 47 percent; Canada goose production decreased 59 percent, (Section G.3.).

The bald eagle pair hatched and successfully fledged two eaglets, (Section G.2.).

B. CLIMATIC CONDITIONS

With the exception of total precipitation and snowfall, climatic conditions were similar to WPAs located in Flathead County. Refer to the Wetland District Narrative for specific information.

In 1989, snowfall totaled 125.5 inches. Accumulations are generally higher in the Swan Valley area because of the influence of the surrounding Mission and Swan Mountain Ranges. Total precipitation was only .15 inches below the 12-year average. Climatic data for the Refuge is provided by Adolf Kopp Jr. who lives near the town of Swan Lake. Adolf is under contract with the National Oceanic and Atmospheric Administration and supplies the data listed in Table I.

Table I. 1989 Climatic Data, Swan River National Wildlife Refuge

MONTH	TEMPERATURE		PRECIPITATION (INCHES)		SNOWFALL
	HIGH	LOW	1989	12-YR AV.	1989
January	52°	- 2°	3.21"	3.12"	28.0"
February	47°	-34°	1.66"	2.54"	21.5"
March	53°	-13°	2.39"	2.06"	15.0"
April	76°	15°	1.71"	1.49"	4.0"
May	78°	26°	1.77"	2.41"	.0"
June	84°	33°	1.34"	1.98"	.0"
July	93°	37°	.86"	1.57"	.0"
August	90°	35°	3.45"	1.62"	.0"
September	79°	21°	1.01"	1.59"	.0"
October	72°	21°	2.55"	1.76"	1.0"
November	55°	9°	3.31"	2.98"	14.5"
December	38°	6°	3.19"	3.48"	41.5"
Totals			26.45"	26.60"	125.5"

C. LAND ACQUISITION

1. Fee Title

Several coordination meetings concerning BPA/KERR acquisition and mitigation were attended throughout the 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 1989. Refer to the Wetland District Narrative for further information concerning the mitigation programs and potential acquisitions.

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. Refer to the Wetland District Narrative for administrative details.

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 the "alluvial floodplain" adjacent to the south end of Swan Lake. Vegetation is composed primarily of dense stands of reed canary grass.

With the exception of a culvert under Bog Road 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.

In 1989, approximately 90 percent of the Refuge was flooded during May and June (Figure 2).

Figure 2. Annual flooding of the Refuge is caused by snowpack runoff and subsequent overflow from both Swan River and Swan Lake. Flood waters did not begin to recede until mid-July. RW 6/14/89

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 in 1989. The extensive reed canary grass meadows would likely benefit from periodic grazing to create openings and additional pair habitat. However, this year's wet conditions initially precluded this activity. Contacts made with potential cooperators later in the summer and early fall did not result in any interested parties. The lack of interest was due to the need for extensive interior fencing and the fact that nearby Forest Service grazing leases were cheaper than FWS AUM rates.

8. Haying

No special use permits were issued for haying on the Refuge this year. In late September, force account mowing was done around the goose structures located in the reed canary grass meadows (Figure 3).

Figure 3. Dense stands of reed canary grass were mowed in an attempt to open up the thick vegetation and provide additional open water areas. RW 10/16/89

10. Pest Control

Canada thistle is the most persistent noxious weed found on the Refuge. Infestations are generally limited to elevated upland sites and the nesting islands located in the northwest portion of the Refuge. In 1989, high water levels apparently limited thistle growth on areas normally infested. High water also limited our access for control purposes and no control work was done this year.

G. WILDLIFE

2. Endangered Species

Swan River Refuge lies within the "habitat corridor" of the endangered grizzly bear. There were no observations of grizzly bears or their sign made on the Refuge this year.

The nesting pair of bald eagles returned to the Refuge in early February. Two eaglets were fledged in mid-July. The pair and young utilized the Refuge the rest of the year, presumably feeding on waterfowl, fish and rodents.

3. Waterfowl

Duck pair counts were completed on May 18, followed by brood counts on the 11th of July. Because of high water levels this year, all surveys were done with the jet boat and a small airboat.

In 1989, observed duck pairs increased 28 percent compared to 1988 figures (Table II).

Table II. Pair Count Data 1985 - 1989

SPECIES	1985	1986	1987	1988	1989
Mallard	32	35	35	50	54
Cinnamon/BW teal	32	15	23	29	31
Common goldeneye	15	5	15	19	30
Wood duck	8	1	3	0	3
Common merganser	0	4	1	3	8
Widgeon	2	0	5	0	3
Pintail	2	0	3	0	3
Ringneck	2	0	0	4	1
Barrows goldeneye	1	0	0	0	0
Shoveler	1	0	0	2	3
Bufflehead	0	0	1	0	0
Greenwing teal	0	0	0	3	0
Gadwall					1
Lesser Scamp					4
Total	95	60	86	110	141

Duck production figures were calculated using a hen productivity rate of .35, obtained from nest searches on Blasdel WPA this year. Using the productivity rate, an average brood size of 5.2, and a brood survival rate of .7, estimated production for 1989 came to 172, a 47 percent increase over 1988 production estimates (Table III).

Table III. Estimated Duck Production, 1981-1989 Swan River National Wildlife Refuge

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Ducks	683	1152	1005	*	244	150	172	91	147

* Duck production unknown, no surveys made.

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 April (spring migrations), Table IV, and in September (fall migrations), Table V. Total waterfowl use-days this year were estimated at 223,230, a 64 percent increase from CY88 estimates.

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

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Swans	80	8	20	40	0	16	100	136	180
Canada geese	280	380	350	300	223	75	150	150	205
Ducks	530	1770	1270	136	920	367	215	535	2595

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

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Swans	28	52	20	37	10	10	35	36	*55
Canada geese	330	260	200	165	40	175	175	275	150
Ducks	720	1050	1160	780	440	847	495	1086	550

*Observed in December

Canada goose production estimates were based on aerial pair counts done in April followed by brood counts in early June. Nesting probably occurred on the Refuge in elevated upland sites and on remnants of old borrow dikes. The nesting islands in the northwest portion of the Refuge were searched this year but no nests were found. In addition, none of the seventeen goose structures installed in 1987 were used. The reason for this is unknown. Canada goose production estimates are listed in Table VI. These figures may or may not represent actual production on the Refuge. As in past years, broods which hatch within the Swan River/Lake system often migrate to the Refuge in search of food, loafing sites, or for safety. Figures listed in Table VI reflect observations made on the day of the aerial survey and do not necessarily reflect actual Refuge production. However, these aerial counts, conducted since the mid-70's, continue to be our most accurate index of goose production.

This year's decline in production may be due to high water levels which: 1) probably inundated some nests; 2) eliminated traditional nesting sites; 3) resulted in a dispersal of broods from normal brood sites.

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

	1981	1982	1983	1984	1985	1986	1987	1988	1989
Breeding Pairs	34	38	13	23	15	40	32	25	34
Number of Young Observed	25	56	34	36	94	67	38	77	45

4. Marsh and Water Birds

This year's high water levels resulted in a "sea of water" over the majority of the Refuge in the spring and early summer months. Soras, pied-billed grebes, red-necked and horned grebes, American bitterns, and great blue herons were often observed on each trip to the Refuge. However, populations were down when compared to past years. This was likely due to the flood effect which resulted in little if any vegetative "edge" for the birds' safety. Populations peaked in June when a total of 100 grebes, bitterns, herons and soras were observed.

5. Shorebirds, Gulls, Terns & Allied Species

Species utilizing the Refuge this year included California and ring-billed gulls, black tern, Wilson's phalarope, snipe, avocet, killdeer and several species of sandpipers. Populations did not peak until August and September when water levels receded, exposing interior and lakeshore mudflats. Nesting may have occurred but was not documented.

6. Raptors

Coniferous and deciduous forest areas on the Refuge continue to offer excellent resting and loafing sites for various raptor species. Northern harriers, Swainsons hawks, red-tailed hawks and great-horned owls were the more commonly observed species this year. Nesting may have occurred but was not documented.

Based on random observations, populations of this group peaked from May through June when an estimated 55 raptors utilized the Refuge.

8. Game Mammals

White-tailed deer are the most commonly observed species. Populations were estimated at 25-30. Fawning probably occurred, but was not documented.

The only other observation of game mammals made this year was a lone moose (Figure 4).

Figure 4. In late September this lone cow moose was seen standing in the reed canary grass meadows 1/4 mile south of Bog Road. This was the first recorded sighting of moose on the Refuge in at least five years. RW 9/26/89

10. Other Resident Wildlife

In 1989, coyotes, river otters, beaver and raccoons were observed on the Refuge. Nearly all observations were made on or near Swan River. Exact populations are unknown.

Beaver activity continued along the banks of the river. Old growth cottonwood trees are the beaver's favorite target and at least a dozen more 2-to-4 inch diameter trees were cut down again this year.

11. Fishery Resource

Game fish common to the river portion of the Refuge and the adjoining 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. The creek was again closed to fishermen as part of the annual Refuge closure from March 1 - July 1 (Sec. H.1.).

In 1989, State Fisheries biologists completed their baseline data sets for kokanee, bull trout and northern pike. No further sets are planned for at least five years. Data collected from the study were being analyzed at year's end; future management of the Lake's fisheries will depend, in part, on this data.

H. PUBLIC USE

1. General

Public use of the Refuge was again somewhat limited due to its 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. 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. Because the Refuge is located 38 miles from the manager's headquarters, an exact measurement of public use is difficult.

7. Other Interpretative Programs

Interpretive programs presented this year included management topics involving both the Refuge and Wetland District. Refer to the Wetland District Narrative for specific information.

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 30, followed by the duck opener on October 8. There were no hunter visits for the goose opener and very light pressure (3 hunters) for the duck opener. Success was poor due to a lack of birds and mid-day blue-bird weather. Pressure remained light throughout the remainder of the season. Hunting activity was again centered along the lake's west shore and near the mouth of Swan River. The duck season closed on November 25 and re-opened for one week on December 23. Approximately 250 mallards and 75 Canada geese were in the area the last week of the season; however, no one hunted them. All waterfowl hunting closed for the year on December 31. Hunter visits this year were estimated at 100, resulting in 600 estimated activity hours.

9. Fishing

Fishing activity on the Refuge is limited to the Swan River and Spring Creek after the closure period. High water levels limited fishing visits in the river and success was poor until mid-summer when water levels receded. The most popular fishing spot on Swan Lake is 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. In early May, as many as ten boats with 26 anglers were anchored at the Creek's mouth. Several 10-15 pound pike were taken during the spawning season.

17. Law Enforcement

Law enforcement efforts were concentrated on three areas of concern: 1) the waterfowl season, 2) the closure season (March 1 - July 1), and 3) during the winter months when snowmobilers take to the trails and forests.

I. EQUIPMENT AND CONSTRUCTION

2. Rehabilitation

In September, 1/4 mile of deteriorated boundary fence along Highway 83 was removed.

4. Equipment Utilization and Replacement

In September, a 14' Monark aluminum boat with trailer and a 25-horse Johnson outboard was received from surplus property at Seedskadee Refuge. Other equipment received this year included a surplus ten-inch table saw from Seedskadee Refuge; a surplus 40-hp Ford tractor with a seven foot sickle bar from Arrowwood Refuge; a gas welder and a 2-hp portable air compressor purchased by FWE Division (Creston).

5. Communications Systems

A 40-watt Yaesu mobile radio was purchased and installed in the 4X4 pickup in October. The radio was a much needed item for effective communication during law enforcement patrols.

6. Computer Systems

In May of this year, a 286 AT compatible, Zenith Laptop computer and Toshiba P341SL printer were received for use in Refuge administrative functions.

J. OTHER ITEMS

4. Credits

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