

LEE METCALF

NATIONAL WILDLIFE REFUGE

Stevensville, Montana

ANNUAL NARRATIVE REPORT  
Calendar Year 1988

(WO Copy)

REVIEW AND APPROVALS

LEE METCALF NATIONAL WILDLIFE REFUGE  
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ANNUAL NARRATIVE REPORT

Calendar Year 1988

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4-19-89

Date

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4/24/89

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4/24/89

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## A. HIGHLIGHTS

Volunteer programs logged 1,952 hours, 223 more than last year. (Sec. E-4)

A record number of osprey nests (22) and fledglings (40) were recorded this year. (Sec. G-6)

Trumpeter Swans were observed in November. This is the second recorded sighting for the refuge. (Sec. G-2) A great egret spent a week on station. This was the third sighting on record for the refuge and the 20th for the state. (Sec. G-4)

First deer/gun hunt was held on the refuge, and waterfowl hunters were required to use steel shot. (Sec. H-8)

Public use facilities and information dissemination again improved substantially. (Sec. H-1)

The first teachers workshop, "Seeing Nature Anew" was held in May. (Sec. H-3)

Mitigation money, \$25,000, from Montana Power Company was used to rehabilitate several dikes and water control structures on three small seasonal ponds. (Sec. C-4)



Summer 1988

Sheila Morrison

Whistler's Pond along Wildfowl Lane

## B. CLIMATIC CONDITIONS

Last year's trend of hot and dry continued. Normal precipitation for calendar year was 12.49 inches. Total precipitation for 1988 was 10 inches, which is 20% below normal. Last year, precipitation was 26% below normal. The average temperature was 47.2, 2.6 above normal.

TABLE III. 1988 WEATHER DATA\*\* - LEE METCALF NWR

Month -	<u>PRECIPITATION</u>				Snow- fall	<u>TEMPERATURE</u>		
	Norm*	Inches	DN			Norm*	Avg	DN
JAN	1.45	.62	- .83		5.3	23.5	23.2	- .3
FEB	.86	.63	- .23		2.0	30.5	35.0	+4.5
MAR	.75	.74	- .01			35.7	39.4	+3.7
APR	.78	1.14	+ .36			44.4	48.4	+4.4
MAY	1.51	2.73	+1.22			52.5	54.1	+1.6
JUN	1.65	1.31	- .34			59.6	64.2	+4.6
JUL	.78	.27	- .51			65.7	65.5	- .2
AUG	.79	.23	- .56			63.8	65.4	+1.6
SEP	.89	.18	- .71			55.1	57.3	+2.2
OCT	.81	.72	- .09			44.5	51.1	+6.6
NOV	.97	1.09	+ .12			32.9	37.0	+4.1
DEC	1.25	.34	- .91		2.5	26.8	26.3	- .5
Total	12.49	10.0	-2.49		9.8	44.6	47.2	+2.6

\* Based on 30-year average - 1951-1980

\*\*Weather data provided by U. S. Forest Service, Stevensville, MT  
DN Deviation from norm

These conditions, following last years drought, caused some water retention problems and the worst fire season on record for the Bitterroot National Forest, as well as most of Montana.

The year began with normal temperatures and below-normal precipitation. Snowpack was less than 70% of norm. Soils were drier than normal, and many aquifers were well below normal. Spring and summer stream flows were predicted to be well below average since snowmelt water would be required to recharge dry soils before any runoff could occur.

In February temperatures averaged 4.5 above normal, and the 1967 record high of 62 was reached on the 21st. Snowmelt occurred in the lower elevations, however, nearly all of the water was absorbed by the soil. March continued with unseasonably warm temperatures, but near normal precipitation occurred. Up to this point, the mean valley precipitation had been 60 to 70% of norm

during the previous 15 months. April brought slightly-above normal precipitation and well above normal temperatures.

Well-above normal precipitation fell in May. Refuge impoundments were experiencing excellent flow-through and river levels were elevated by mid month. The peak snowmelt for high elevations occurred during the last week in May. This, coupled with a steady rain, 1.15" on the 30th, was quickly felt causing peak flows for the year in the river and on refuge ponds. Water levels also rose in the quarters' basement.

River, groundwater and basement water levels began to drop noticeably by the end of June. In July, several borrow ditches and ponds on the western side of the refuge, Pond C and portions of the Burnt Fork Supply ditch, dried up and water levels were extremely low in several sloughs. At year's end, many of these areas were still below normal.

The fall was hot and dry. Conditions were so dry throughout the state that the bow season was delayed for 10 days, and heavy restrictions were placed on all outdoor activities. The first frost occurred on 9 September. Although the first snowfall occurred on 26 October, temperatures for the month averaged 6.6 above normal. Above normal precipitation occurred in November, providing some relief. We ended the year with near normal temperatures and 1" of snow cover on the valley floor.

### C. LAND ACQUISITION

#### 1. Fee Title

Two inholdings were purchased on the western boundary of the refuge; the 80-acre Murphy tract on 23 March and the 10-acre Ormsbee, Koch, Grimes, and Johnson tract on 23 May. Both properties were purchased with Land and Water Conservation Funds.

These acquisitions have rounded out the refuge boundary. The 80-acre golf course is the only inholding remaining.

Two property owners, Blackler and Borchard, contacted the refuge about selling lands along the northern boundary. Mike Hines, RE, inspected the properties 6 May. In order to consider these properties, the Executive Boundary would have to be changed, which requires approval of the Migratory Bird Commission.

#### 2. Easements

Dave Janes, RE, spent a day, 6 December, on the refuge. Non-development easements, round-out tracts, and the potential of river corridor protection along the Bitterroot were discussed. Dave also spoke with one landowner who is interested in the non-development easement program.



## D. PLANNING

### 2. Management Plan

Refuge, RO staff, local SCS and County Extension folks continued efforts on revising and refining the Cropland Management Plan. The primary goals are to change from conventional farming to a sustainable operation and convert 100 acres of cropland into DNC. Steve Berlinger, RO, provided a great deal of assistance and time on site, 5-7 May. A new cooperative farmer was selected and a "draft" management plan was prepared. (See Sec. F-4)

This was the second year field data was collected by Ron Skates, Fishery Assistance, Kalispell, MT, for a Fish Management Plan. This year about 700 large-mouth bass were tagged. Three water samples were collected and analyzed. Requests for brood stock for transplanting from the state were filled. The Draft Plan will support this activity as well as Fishing Clinics for local youth. The issue on whether or not to open interior ponds to public access has not been decided at this time.

Memorandums of Understanding were developed and approved between the Refuge and Three Mile and Stevensville Rural Fire Departments 4 April. These are five-year agreements and will be up for review 30 September 1993.

A Memorandum of Understanding was developed between the U.S. Forest Service, Bitterroot National Forest, Stevensville Ranger Station, and the Refuge for a joint YCC program. (See Sec. E-2)

Parts I and II of Refuge Planning were submitted in September.

### 3. Public Participation

The Environmental Assessment for the Proposed Shotgun-Slug/Blackpowder Hunt for Antlerless Whitetails was made available to the general public in January. This proposal was also listed on the Big Game State Tentative Agenda which was subject to both public meetings and a written comment period. One written objection to the hunt was filed by the Montana Bow Hunters Association, Hamilton Chapter.

### 4. Compliance with Environmental and Cultural Resource Mandates

A Section 7 Evaluation was completed for the Refuge Hunting Plan 26 February.

Two proposed projects required special compliance and permits. The following is a summary of CY activities for each.

#### Montana Power Company Mitigation Site/Pair Ponds Restoration

-Milo McLeod, Zone Archeologist, USFS completed a site

- survey on 22 March. Only two "chips" were found, neither of which were archaeologically significant.
- An EA was submitted in June to RO and a determination was made that this project fit under a Categorical Exclusion.
  - Bob McInerney, COE, determined a 404 permit was not needed on 24 June.
  - Soil tests were completed in July.

#### Pond E Restoration - Ducks Unlimited

- Received Right-of-Way from Montana Rail Link, 17 May.
  - MT Dept. of Health & Sciences permit approved, 23 August.
  - MT Dept. of Fish, Wildlife & Parks permit approved, 20 Sept.
  - COE, 404 permit approved, 27 December.
  - Ravalli County Floodplain permit approved, 12 December.
- An EA needs to be written, Water Rights issues settled with the State, and an archeological review and soil tests completed.

#### 5. Research and Investigation

LEE METCALF NR '88 - "Biocontrol Study of Spotted Knapweed"  
Montana State University, Bozeman, MT, Jim Story, Research Entomologist - Principle Investigator, Agricultural Experiment Station, Corvallis, MT.

Since 1984, Mr. Story has been monitoring the results of controlling spotted knapweed by means of insects. The refuge provides an abundance of spotted knapweed which has not been chemically controlled. It is an ideal site for the release and subsequent follow-up of introduced biological control agents. The following is a summary of the 1988 field season results.

1. Efforts were continued to determine the compatibility of two seed head flies, Urophora spp., and the seed head moth, Metzneria paucipunctella. All three occupy the same niche on spotted knapweed. Preliminary information suggest that the moth larvae attack the fly larvae throughout the feeding period. However, it appears the combined effects of the flies and moth on seed production may be greater than that caused by flies alone. Thus, when considering the ultimate objective for releasing these insects (reduction in knapweed seed production), it appears the three insects are compatible. Final results of the study will be analyzed in 1989.

2. A survey was conducted to assess the establishment of the moth, Metzneria paucipunctella, following the 1981 release of 927 adults on the Refuge. Results indicate that the moth is established but in low numbers.

3. This was the second field season to determine optimum procedures for releasing a newly introduced root feeding moth, Agapeta zoeqana. Comparisons were made between caged releases of

eggs and adults in moist and dry sites. Preliminary information suggests that release of adults was slightly more successful than larval/egg transfers to plants. There was no apparent difference in the moth's success in moist versus dry sites. These data are especially significant as they provide the first information to date on the successful establishment of the moth in the United States.

4. An additional 694 adults and 1,029 eggs of Agapeta zoegana were released in 1988 to augment the 1986 releases. Last year, the first recovery in Montana of an Agapeta male was made on the refuge using a pheromone trap.

5. A study to monitor the phenological development of spotted knapweed was initiated this year. The refuge site is one of several in the Bitterroot Valley.

6. Data were collected from permanent plots established on the refuge to monitor long term changes in the density of spotted knapweed and competing vegetation.

#### E. ADMINISTRATION

##### 1. Personnel



3      2 2a 4      1

1. Margaret M. Anderson, Refuge Manager (PFT), GS-11, EOD 8/86
2. Calvin J. Henry, Maintenance Worker (PFT), WG-8, EOD 10/84
- 2a. Kootenai, Seasonal Duck Retriever
3. Patience V. Fehr, Refuge Assistant (PPT), GS-5, EOD 3/86
4. Beth K. Underwood, Clerk-Typist, Education Tech., (TPT), GS-5

FIVE YEAR YEAR STAFFING PATTERN - LEE METCALF NWR

<u>FY</u>	<u>Permanent</u> <u>Full-time</u>	<u>Part-time</u>	<u>Temporary</u>	<u>Total</u> <u>FTE</u>
88	2	1	1	2.8
87	2	1	2	2.9
86	2	1		2.6
85	2	1	1	
84	2	1	1	

Patience Fehr returned from maternity leave on May 16. She was upgraded from a Clerk Typist to Refuge Assistant effective 6 November.

Beth Underwood, Ed Tech 5 (typing), completed her tour of duty on 27 August. She returned as Education Technician 24 October under a 180-day intermittent appointment.

Debby Burton, RO-PM, performed desk audits on all positions on 22 August.

2. Youth Programs

The YCC program on the refuge is administered under a Memorandum of Understanding with the U.S. Forest Service, Stevensville Ranger District. This agreement states:

- The FS will employ 6 enrollees and 1 leader and the FWS will employ 2 enrollees.
- Each agency is responsible for recruiting, payroll, Form 4's, 5's, etc.
- All enrollees work 6 weeks for the FS and 2 weeks for FWS.
- The FS provides supervision and transportation.

This agreement works well for both agencies and provides enrollees with a greater variety of field experience.

In a drawing held 15 April, pre-schoolers from the Kinderhaus Day Care Center selected John DePue and Kathryn O'Conner from 15 applicants to be the refuge enrollees.

We had an exceptional group of enrollees this year. They removed old residential and refuge boundary fencing on the newly-acquired Murphy tract and installed fencing and signs along the new boundary. They constructed two new nature trails, about 1.6 miles. Interpretive signs were installed along both trails.





7/88

MA

YCC installing interpretive trails.

### 3. Other Man-Power Programs

This was the second year the U.S. Navy Reserve, Mobile Construction (SEABEE) Battalion, stationed out of Old Fort Missoula, used the refuge for a work site. On an average, six to ten Seabees usually spend one weekend a month working on refuge projects. Work includes heavy equipment, building, vehicle, structure, and public use facility maintenance.

This was the first year the refuge utilized the Workfare program, which is administered by the State through the Human Resource Council. Gary Bonebright and Alan Bryant were assigned to the refuge and provided much assistance with general maintenance. Both the Seabees and the Workfare people are signed up as refuge volunteers. All hours worked on the refuge and projects completed are reported in the Volunteer Section.

### 4. Volunteer Programs

This year the refuge volunteer program was again blessed with several dedicated and talented individuals and groups. They contributed a total of 1,952 hours, 223 more than last year.

Earl Mansfield again contributed the most hours of any individual and beat his last year's record by 99 hours. Earl is a workaholic who adopted the refuge in January, 1987. Although Earl has worked on many different projects - fencing, signing, public use facilities, habitat protection - his pet project is maintaining wood duck boxes and evaluating their success. This year he mapped



all wood duck box locations. He also suggested having a "greeting committee" of volunteers at our KIOSKS during Holiday weekends. This would be an opportunity to contact our local refuge users, explain our mission, new changes, collect ideas and concerns, and hopefully reduce the number of general trespass incidents. We plan to try this approach in the upcoming year.

Sheila Morrison completed her second year as a refuge volunteer, contributing 262 hours, 196 more than last year. Sheila completed a slide show with text on the flowering plants of the Lee Metcalf Refuge. She has nearly completed a leaflet on plants of interest along our two new nature trails and will begin to concentrate on photographing bushes, trees and grasses.

Don Mellgren has also completed his second year on the refuge. Don conducts the weekly waterfowl counts. This year he divided the refuge into management units and redesigned the census sheets.

1988 Volunteers - Lee Metcalf NWR

<u>Name</u>	<u>Hrs.</u>
Earl Mansfield	344
Sheila Morrison	262
Gary Bonebright(WF)	140
Don Mellgren	120
Larry Anderson	76
Lee Nelson	54
Beth Underwood	54
Beatie McGill	52
Debby McGill	48
Marsha Mansfield	22
Dick Hutto	30
Jim Story	30
Jack Hogg	30
Stephen Rickard	30
Linda Greenwood	30
Carla Wombach	30
Cathy Hatch	30
Jim Solomon	30
Paul Todd	30
Alan Bryant(WF)	23
Judy Senk	10
Russ Parrish	8
Judy Hoy	8
Karen Bleibtry	7
Linda Rosin	6
Michael Fehr	3
Bitterroot Audubon	32
SEABEE Battalion 1718	413
TOTAL	1,952

Volunteers who had reached 200+ hours or two years of continued service were recognized for their contributions by the Regional Director with a letter and Certificate of Appreciation. This year Earl Mansfield and Lee Nelson were recognized in March, and Sheila Morrison and Don Mellgren in September. All received gift certificates from the ducks and flowers.

A great deal of emphasis was placed on projects involving environmental education. Beth Underwood, Education Tech., initiated and coordinated all efforts in this category for which she received a Special Achievement Award. The following is a break down of volunteer projects.

<u>Project Description</u>	<u>Hrs</u>
General Maintenance	706
(Bldgs./Vehicle/Heavy Equip./	
Fencing/Public Use Facil.)	
Environmental Education	450
Flowers (slide collection/talk)	242
Waterfowl Census	124
Pheasant Trapping	110
Water (gauge readings/instal.	98
safety screens)	
Habitat(cattail ctrl/protection)	74
Waterfowl Blinds/Signing	65
Prescribed Burning	32
Wood Duck Box Maint.	32
LE-Observation/Track Deer	16
Computer	3

A social get together between local volunteers and refuge staff was held during the Christmas Holidays. Several of the volunteers had never met before. Sheila Morrison provided entertainment and showed her flower slides.

##### 5. Funding

This year funding was adequate to accomplish annual work plan advices, initiate an environmental education program, and refurbish some facilities.

##### FIVE YEAR FUNDING SUMMARY - LEE METCALF NWR

<u>FY</u>	<u>YCC</u>	<u>TOTAL FUNDING</u>	<u>QUARTERS</u>
88	3,000	123,000	8,200
87	3,000	129,700	8,681
86	3,000	122,500	3,000
85		136,000	
84		130,000	

## 6. Safety

Facilities & Equipment: The Seabees completed installation of safety screens on half-riser water control structures on Ponds 2, 3, 8, 10, and 11. Two irrigation pumps were converted from 5 clip meters to 7 clip. Montana Power Company, for safety reasons, is phasing out the 5 clip meters. A small portable water pump was purchased for use in controlling fires inaccessible to vehicles.

Safety meetings are held periodically and the following is a summary.

### 1988 SAFETY MEETINGS & TRAINING - LEE METCALF NWR

<u>Date</u>	<u>Attended By</u>	<u>Topics</u>
Jan	Anderson, Underwood, Henry	Thermal Wilderness
Feb	Debby McGill	8-hr Defensive Driving
Apr	Henry	Hot Cords Burn
May	Henry	How to Involve Joe
Jun	Anderson	4 Hr. First Aid Refresher & CPR recert.
Dec	Anderson, Henry, Fehr, Underwood	USFWS film: "Drugs in the Workplace"

## 8. Other Items

Special Achievement Awards: In June, Beth Underwood was recognized for her outstanding efforts in initiating an environmental education program which included recruiting and supervising 12 volunteers who donated 450 hours. She received a Special Achievement Award and check for \$200. Anderson also received a Special Achievement Award and \$500 check for initiating a strong volunteer program on the refuge.

Anderson attended: the Montana Project Leaders Meeting, 2/9-11, Lewistown; and the Annual Work Planning Meeting, 8/29-9/1, West Yellowstone, MT.

Training completed during the year is listed on the following page.

1988 TRAINING COMPLETED - LEE METCALF NWR

<u>Date</u>	<u>Attended By</u>	<u>Topic</u>
2/16-22	Anderson, Henry	40 hour LE Refresher Marana, Arizona
6/6-10	Henry	S390 Fire Behavior Boise, Idaho
7/20	Anderson, Henry	Roster Steel Shot Seminar (4 hours) Missoula
July	Henry	8 hour Steel Shot Clinic
7/28	Underwood	3 hour Riparian Seminar
August	Henry	LE Update and Qualification, CMR
December	Anderson	9 hour Intro to DBASE

F. HABITAT MANAGEMENT

1. General

There have been no major changes in the habitat inventory in 1988 except to add 90 acres of river bottom habitat.

2. Wetlands

The refuge has an excellent water supply through shares owned by the U.S. Government in the Supply Ditch Association. This year, however, because of the prolonged drought (see Sec. B.), by the end of July several borrow ditches and ponds on the western edge of the refuge, Pond C and portions of the Burnt Fork supply ditch, dried up. Water levels were extremely low in most sloughs. At year's end, many of these areas were still below normal.

Efforts were made to maintain most ponds at maximum pool. Levels have been managed this way for the past 10 years for cattail control and to benefit the nesting osprey. In 1987, scheduled drawdowns were again employed. At the beginning of the year, Ponds 1 and 6 were dry. Both were in a scheduled drawdown for 1987.

Sapphire Pond (#1) essentially dries up each year after irrigation is closed down. It entered its second year of

drawdown until the end of May. At this time it was partially flooded to within 3.6' of operational pool. Vegetation establishment was excellent and cattail encroachment was not a problem. Waterfowl, shorebirds and a pair of sandhill cranes used the area extensively. Deer were often observed feeding extensively on the sparganium.



7/88                      Pond C                      MA  
Great blue herons kept this area clean  
of dead fish as level receded.



6/88                      Pond 1                      MA  
Water levels were partially restored  
in May after one plus years in drawdown.



Mallard Pond (#6) was reflooded in May after a year in drawdown. Prior to flooding, explosives were used to create a small pothole, an island, and to restore an old channel, 65'x 130'x 5'depth, which had been choked with cattails. The U. S. Forest Service provided certified blasters to assist. A second planting of wild rice tubers on 29 March was successful on a 1000 square foot plot after it was protected from feeding waterfowl and muskrats.



3/88

MA

Removing cattails. This was great fun, and one portion of the channel was occupied by three pair of nesting waterfowl and two muskrat houses that were easily visible from the road.

Teal Pond (#4) was drained the first of April and remained in drawdown throughout the year. Vegetative establishment was excellent. Plants observed were veronicas, smartweeds, a variety of forget-me-not, watercress, and some bulrush. Cattail encroachment was not a problem.

Attempts to establish wild rice in several ponds and sloughs on the west side failed when these areas dried up in July. Monitoring of these plots is being done by Mal Wescott, Western Agricultural Research Center. The local sportsmans club and Audubon group purchased the tubers.

Three seasonal ponds were rehabilitated with mitigation funds from Montana Power Company. Engineering and administration was provided by Ducks Unlimited. These ponds will depend on water from the Supply Ditch. Full riser water control structures were installed, and existing dikes and ponds reshaped. The project cost nearly \$26,000 and should provide about 5 surface acres of water.

Ducks Unlimited has taken on the task of solving the problem of sediments entering the northern ponds via Threemile Creek. The proposal is called the Pond E (Otter) Restoration project. Water will be diverted from Pond 10 into 11 via a new pond, E, completely bypassing Threemile.

Funding was not available to clean out the Threemile sediment ponds this year. About 15,000 cubic yards of washed sand are stockpiled along the edges of these ponds from last year's efforts. On 23 July we held our first "FREE SAND DAY" - We load, YOU haul. It was a great success, and 350 cy of sand were removed from this site. The demand was so great that several more "FREE SAND" days were held, only the conditions changed to YOU load and haul. The word is out and now schools, parks, and the Forest Service come to us when they need fill. Someday, perhaps, those piles of sand will be gone.

### 3. Forests

There are about 1200 acres of river bottom forest lands which are typically of the Ponderosa pine-cottonwood type. The present age of timber and the open growing sites precludes its being of commercial value.

In recent years beaver pose a continual threat to several cottonwood stands, DBH's 4 to 20 inches. These younger trees will be future osprey nest sites and must be protected. The State opened the area to beaver trapping in 1985; however, few have been taken from the surrounding area. Special Use Permits have been issued for trapping during the last four years. Staff personnel have also relocated animals.

### 4. Croplands

In the past about 330 acres of land were farmed by one or two permittees. Roughly 40% of the land was in summer fallow each year for weed control and the balance in small grains. Chemicals and fertilizer were also used. The permittee paid all farming operation expenses with the refuge providing the water. The farmer harvested two-thirds and left the remainder standing.

National concerns for groundwater contamination, ecological and human health associated with pesticide use, and the need to reexamine past farming practices initiated an evaluation process in 1986. At that time 188 acres were irrigated and 142 acres were subirrigated or dry land farmed. Since that time, a great

deal of time and effort has been spent by refuge and regional office staff, and local SCS and County Extension Agents. The following is a summary of goals to date:

- reduce cropland acreage by 100,
- convert from a conventional to a sustainable program involving cropland rotation,
- and improve irrigation equipment by converting hand lines to wheel lines.

This year we entered into a five-year transition plan. During this time, summer fallowing, chemicals and fertilizers will be phased out. Nitrogen-fixing crops will be used on a rotational basis to improve soil tilth and health. Irrigated croplands, 170 acres, will be managed in a 5-year rotation involving small grains and alfalfa. Sub-irrigated lands, 90 acres, will be managed in a 3-year rotation of sweet clover and small grains.

Accomplishments to date:

- 25 acres of subirrigated and 10 acres of dryland have been planted to DNC, and 42 additional acres have been identified.
- A new permittee was found and 65 acres were planted to alfalfa that normally would have been in fallow.
- Yellow sweet clover was planted on 20 acres of subirrigated land.

Planting of alfalfa was not completed until July. No fertilizers were used. A straight alfalfa mix, containing 20% of a spreader variety was used. The area was hayed in September, more for weed control than harvest of alfalfa. One 20-acre field that was left to weed was hayed in September in preparation for a spring planting of alfalfa.

Transition problems revolve around lack of funds to purchase sufficient irrigation equipment. Hand lines owned by the FWS cover only 50% of the fields. Conversion to a wheel line system was estimated at \$55,000. Another problem is wild oat control, especially in the subirrigated lands.

Small grain harvest involved 52 acres of irrigated land planted to spring wheat and 75 acres of subirrigated to winter wheat. Winter wheat yields were 51 bu/ac and spring wheat 95 bu/ac. Wild oats was again a problem in winter wheat areas. Normal yield of this cereal grain crop is 90 to 110 bushels per acre. About 3,000 bales of straw were removed from these fields. This crop was Cooperative Farmer Bob McElhaney's last, after 24 years of farming for the refuge, and prior to that, for his dad, who owned a large portion of the land.

Steve Berlinger, RO, spent a week on station looking over the

program, spoke with prospective farmers, got us pointed in the right direction and later provided a great deal of information and assistance.

## 5. Grasslands

Keith Robertson, SCS, spent a great deal of time advising us on DNC mixtures and planting techniques. We did our best to mechanically prep a 25-acre field for planting, but eventually had to burn it off. Only 7 acres of wheat had been harvested from this field last year, and the rest was left standing because of heavy wild oat infestations. The following is a summary of all DNC plantings completed.

<u>Acres</u>	<u>Mixture</u>	<u>#/ac</u>
15	Ladak A.	1.3
	Basin WR	6.0
	Delar Sml. Burnet	1.3
	Alkar TW	4.5
8	Basin WR	6.0
	Delar Sml. Burnet	2.0
	Alkar TW	4.4
5	Basin WR	8.4
	Alkar TW	3.4
	Ladak A.	3.4
8	Basin WR	8.0
	Delar Sm. Burnet	3.0
	Alkar TW	3.0

Areas infested with wild oats were fallowed and planting completed on 17 and 20 May, which is the latest time SCS recommends for this area. Even so, there was a tremendous wild oats response. A deal was struck with an adjoining rancher to hay 35 of these acres, the 20-acre sweet clover area, and a 10-acre area scheduled for planting in 1990.

It is too early to evaluate planting success.

## 6. Other Habitats

Vegetation, specifically browse species, has suffered due to the surplus of whitetail deer on the refuge. A browse line is evident throughout most of the refuge. More acres were opened to archery hunters, and a special gun hunt for antlerless deer was initiated this year to increase harvest.

Many of the refuge wetlands are surrounded by stands of Ponderosa pine and northern cottonwoods. A large number of these stands died after initial flooding of impoundments. These dead timber stands, which provide excellent wood duck brooding areas, are

slowly disappearing.

#### 7. Grazing

All grazing was terminated in August 1975.

#### 8. Haying

The following is a summary of hay removed primarily for weed control. Haying was done after July 15.

<u>Area/Acres</u>	<u>Tons</u>
25 - DNC	39
20 - SC	56
10 - Weed/Stub	6
20 - Weed	18
65 - Alfalfa	30

#### 9. Fire Management

One wildfire occurred on 13 August when lightening struck two old snags in an area inaccessible to vehicles. Threemile Rural Fire Department sent six men to assist Henry. Fortunately a heavy rain of short duration accompanied the storm and less than an acre was burned. This fire could have easily burned a large area as heavy fuels, high winds, and extremely dry conditions existed.

About 3 acres of supply irrigation ditches, located on and off the refuge, were burned. Fifteen acres of standing wheat and wild oats were burned as part of seed bed preparation for a DNC planting. The Pond 4 cattail burn scheduled for this fall was cancelled due to extremely dry conditions.

#### 10. Pest Control

Leafy Spurge: The patch on an island, dike, and river bank near the Bass Creek outlet continues to be a problem. On 29 July 87, 200 Hawk moth caterpillars were released on the island. No additional insects were released this year. A small patch of leafy spurge found on the north end and scattered spots in the road north of the Reynold's barn were diligently pulled throughout the summer.

Spotted Knapweed: See sec. D-5 for results of research efforts directed at controlling this weed.

Purple Loosestrife: To date no plants have been found on the refuge; however, landscape companies continue to sell this pest as an ornamental. The State Department of Agriculture presented a program during several landscape and nurserymen meetings in the hopes of obtaining voluntary constraints in the selling of this plant. A local supplier has posted a warning sign telling customers not to plant near water.



Herbicides: One application of 2,4-D Cleancrop was made to 140 acres of cropland by the cooperative farmer.

## G. WILDLIFE

### 1. Wildlife Diversity

Sapphire Pond (#1) remained in drawdown until the end of May when it was partially reflooded. Teal Pond (#4) was drained in April and remained in drawdown throughout the year. Both areas were used extensively by migrating shorebirds and waterfowl, as well as duck broods. The Pond 1 area was utilized by our sandhill crane pair on a daily basis July through August.

### 2. Endangered and Threatened Species

BALD EAGLES: The refuge is primarily used by bald eagles during migration and throughout winter. Winter use depends on the availability of open water. No nesting has been observed on the refuge; however, over-wintering pairs often roost in close association with osprey nests.

A peak number of 13, ten adults, occurred in January, well below last years February peak of 31. During the aerial mid-winter waterfowl survey on 6 January, 35 bald and six golden eagles were tallied between Missoula and Grantsdale. The last spring eagle was observed on 31 March. The first eagle of the fall arrived on 16 September. Throughout October, November and December the average population was three and the peak six. Both last year and this year the salmon runs in Glacier National Park were poor, this may have some bearing on wintering eagle numbers in the valley.

During the fall and winter, road killed deer are placed on the refuge to decoy eagles from waterfowl wounded with lead shot. This year the use of steel shot was instituted state wide. We maintained the feeding station since other raptors, coyotes, ravens, and turkey vultures also benefit. On 14 March, a dead adult bald eagle was found at this site. It was sent to Madison, WI for analysis but results are not in yet.

PEREGRINE FALCON: Sightings and use by this species increased this year.

#	<u>Dates</u>
2	4/27 to 5/5
2	8/18
1	9/1
1	9/29
2	11/23
1	12/16

TRUMPETER SWAN: Four were observed on 22 November and two on 1 December by Henry and Mellgren respectively. The only other recorded sighting occurred in 1975.

### 3. Waterfowl

#### Ducks:

Unseasonably mild weather and open water discouraged large concentrations of wintering waterfowl in the valley. Wintering populations on the refuge averaged 1,000 to 3,000 ducks, which was lower than last year. The majority of these birds were mallards. The aerial mid-winter waterfowl survey was conducted on 6 January. A total of 6546 mallards were censused in the Bitterroot Valley, Missoula to Grantsdale.

Spring migration began in late February with goldeneye, gadwall, widgeon, blue-winged teal, scaup, common mergansers, pintail, and a few wood ducks.

A major fall concentration never happened. Mild weather allowed birds to move in and out unobtrusively. The peak number for the year reported by Volunteer Mellgren was 2,947 on 23 November; although Henry reported a one-day stop over of 12,000 on 16 November. Normally, peaks ranging from 8,000 to 27,000 occur in late November, December, or January.

Pair counts were conducted in May. Pairs of mallards, widgeon, blue-wing, and cinnamon teal decreased, whereas redhead increased as compared to last year. The following is a summary of major species censused.

<u>Species</u>	<u># Pairs</u>
BW/Cinn. Teal	70
Mallard	51
Wood Duck	50
Redhead	67
Widgeon	19

Wood ducks were observed at nest boxes on 29 March and the first mallard nest was found. A nest success study was scheduled for this spring but was postponed due to man power shortages. However, in May a university class did a nest success survey on the Otto Teller Wildlife Refuge. This is a private refuge located just south of Stevensville. Only four natural nests were found; all of which were destroyed. Dummy nests yielded a May field success of 1.5!

Brood surveys were not conducted as vegetation makes sampling very difficult; however, young wood ducks concentrate in a few areas and are easily censused. Production of this species was excellent with about 400 produced.

### Swans:

The spring migration began when five tundra swans arrived on station in early February. They peaked at 279 in March, and only 7 remained at the beginning of April. The first fall migrants, five, were sighted 25 October, increased to 95 in November, and by 7 December only one remained.

### Geese:

Normally, very few snow geese use the refuge or the Bitterroot Valley. This year the first snow geese, 12, arrived on 28 April, and remained for the week. None stopped over during fall migration. Large numbers were observed in the falls of 1983, '84 and '86 and are directly tied to weather conditions.

Only two Ross's geese were seen on 14 April.

The winter Canada goose population averaged 300 compared to 450 last year. Valley wide, 777 were censused on 6 January. Geese were first observed setting up in osprey nests on 9 February.

Gosling production was down 10% compared to last year. The first brood was observed on 14 April, one day earlier than last year. On 17 May, 201 goslings were counted from 39 broods. Two late broods were seen on 22 and 30 June.

### Canada Goose Populations and Production - Lee Metcalf NWR

<u>Year</u>	<u>Peak</u>	<u>Month</u>	<u>Production</u>
1988	1210	Dec	205
1987	1400	Nov	227
1986	1800	Nov	191
1985	*	*	162
1984	1000	Dec	226
1983	1000	Dec	300
1982	1050	Dec	280
1981	950	Dec	250
1980	1000	Dec	175
1979	550	Nov	180
1978	910	Dec	170
1977	465	Oct	175
1976	550	Dec	125
1975	800	Dec	130
1974	*	*	150
1973	500	Nov	100
1972	700	Dec	100
1971	340	*	53
1970	*	*	25

\* no data



UNK R. Twist  
Tree nesting geese were first recorded  
by Lewis and Clark. This one is using  
an osprey nest.

Prior to the waterfowl opening, the refuge goose population was about 450. The fall peak, 1209, occurred 1 December.

#### 4. Marsh and Waterbirds

The refuge provides limited habitat for this group of birds. Species found in relatively small numbers are double-crested cormorants, pied bill grebes, great blue herons, and bitterns. All nest on the refuge except cormorants. Red-necked, eared, and horned grebes are usually seen during spring migration and occasionally a common loon or western grebe.

Cormorant numbers and use increased this year. The first arrived 17 April and the last was seen on 10 November. The average population was 36 from mid-June to the end of September; the peak was 51 on 12 August. Birds concentrated primarily in Pool 10. Last year the peak was 11 with an average population of five to eight throughout the summer.

Great blue herons remain in the valley year round. The peak number, 48, was counted on Pond C in July. At this time, water levels had dropped dramatically in this pond and others which allowed for a herons' banquet. Only two nests were observed this year; however small rookeries are located along the Bitterroot

north and south of the refuge.

Two eared grebes were seen on 25 February, with 1 to 11 observed April through July. The first western grebes, two, arrived 21 April; four were observed 19 May and one 6 June. A dead one was found the end of May.

A great egret again returned to the refuge 19-26 May. This is the third sighting for the refuge and the 19th or 20th for the state. Last year one remained for a week in June.

The nesting pair of sandhill cranes returned on 5 April for their fifth year. One chick was observed on 1 June (two chicks last year on this date). This chick was last seen the end June. Shortly after, the adults were frequently seen flying from pond 1 to the area behind the quarters. Young were last observed on 5 June in 1987. No chick survival is suspected for this year or last. On June 2 and 9, seven and four adults were observed. The nesting pair of cranes left 19 September. Mellgren observed one crane on 1 December.

Two white-faced ibis arrived on 10 May and remained for two weeks.

#### 5. Shorebirds, Gulls, Terns and Allied Species

Among the shorebirds killdeer, common snipe, and Wilson's phalarope are the most common species in this category, whereas, whimbrel, sanderling, and stilt sandpiper are the most uncommon.

The first avocets, 11, arrived on 12 April and increased to 21 by the end of the month. Smaller numbers remained on station throughout May, primarily using drawdowns and the backside of Pond 5.

Wilson's phalaropes, Baird's and western sandpipers, willets, sanderlings, and four black-necked stilts arrived in May. Long-billed dowitchers also arrived in May; a peak number of 35 was observed on 1 September.

Ring-billed gulls are most commonly seen during spring migration and rarely exceed 50 total. A black tern and three Franklin's gulls were seen in May and two Caspian terns in June. Unfortunately, this year we did not have the staff or volunteer time to devote to this category as we did last year.

#### 6. Raptors

The Metcalf refuge provides excellent habitat for many species of raptors. Red-tail, rough-legged, Harrier, Cooper's, kestrel, sharp-shinned, and goshawk are the common hawks. Prairie falcons are seen periodically. The great-horned owl is the most common and easily seen of all the owls; however pygmy, long-eared, and short-eared owls frequent the refuge also.





1983

R.Twist

Pygmy owls utilize the river bottoms  
but are rarely seen.

OWLS: Three short-eared owls were observed during most of March. Four moved into the waterfowl hunting area on 17 November and stayed the rest of the winter.

OSPREY: The most common and easily observed raptor is the osprey. The abundant fish population and relative seclusion for nesting sites provide ideal conditions for this species.

Tree nesting sites were again at a premium. Two pairs built nests on power poles. The 'shop' nest was abandoned as was the 'residence' nest when things became a bit hot after heavy rains on 30 May causing arching between nesting materials and the wires. Power Company officials had been alerted to the problem prior to this. Shortly after, they erected new poles and moved both nests in preparation for next year. Last year they had to move three nests.

Osprey return almost religiously on or around 1 April. This year 22 active nests were found on the refuge and one just outside. In the past, nests were flown to determine number of young. We were unable to do this, but from ground checks we estimated 40 fledged. The last bird left the nest on 13 August.

OSPREY PRODUCTION - LEE METCALF NWR

<u>Year</u>	<u>Active Nest</u>	<u>Fledged Young</u>
88	22	40
87	19	28
86	13	23
85	15	21
84	12	21
83	11	18
82	8	13
81	11	16
80	7	12
79	5	13
78	5	10
77	5	11
76	5	12
75	5	8
74	4	11
71	1	3
70	1	2
65	1	3
64-69	one nest n. of the refuge	



7/88 Joanne McElfresh  
Moving osprey nests is becoming a spring  
ritual for MPC officials.



UNK

R.Twist

Birds eye view.

Two sick immature osprey were picked up in August. One was successfully rehabilitated, the other died. The autopsy revealed it had a broken back. The majority of osprey leave by mid-September. The last sighting occurred on 30 September.

OTHER: A gyrfalcon was observed on 30 November. Two prairie falcons moved in on 7 November and remained throughout the month.

Golden eagles, one to three, were observed January through April, July, October and November.

#### 8. Game Mammals

The white-tailed deer is the only game mammal hunted on the refuge. Censusing is usually limited to the winter months after the close of archery hunting. Censusing begins at dusk and a spotlight is used after dark. A 13-mile route is covered, and deer moving on and off the refuge are counted. Five census nights were completed this year with a peak of 335.



WINTER DEER COUNTS - LEE METCALF NWR

<u>Year</u>	<u>Peak # Censused</u>
88	335
87	329
86	297
85	281
84	262
83	221
82	No Data
81	250
81	215
80	255
79	197
78	130
77	No Data
76	112
75	90
74	75
73	No Data
64	10

The census reveals an alarming increase since the late 1970's, a trend which is occurring throughout the Bitterroot River bottoms. Mild winters during the past four years, an excellent food source, high reproduction, and low harvest (archery hunting only) have perpetuated conditions for herd expansion. Conditions are ideal for a catastrophic die-off due to harsh winter conditions or disease.

Total habitat available to deer on the refuge is 2100 acres. Peak number of deer censused in February 1988 was 335; yielding 1 deer/6.2 acres. Woody vegetation has suffered from this surplus as evidenced by a browse line throughout most of the refuge. After visiting the refuge in 1987 and conducting a literature review, Dr. Bill Seitz, Regional Assistant Wildlife Biologist, indicated that a population level of 1 deer/50 acres would allow for recovery of vegetation on the refuge.

In spite of these conditions, deer do well because of surrounding agricultural lands. Most of the herd migrates off the refuge at night to feed. Deer harvested are fat, bone marrow is in good condition, and production has remained high.

Although formal production census have not been conducted, twinning among does has been the rule for the past several years, with sightings of triplets common. The first fawn was observed on 3 June, one day earlier than last year. This year there seemed to be fewer fawns than last year. Prior to the hunting season, rough estimates indicated about 500 deer were on refuge, 100 less than last year.





1983

R. Twist

The refuge deer herd provides hours of viewing pleasure for sportsmen and wildlife observers alike.

On 20 December, in cooperation with the state, a helicopter survey was conducted on the refuge and on private land to the south. The following is a summary:

	<u>Tot.#</u>	<u>Fawns</u>	<u>Does</u>	<u>Fawn:Doe</u>	<u>Bucks</u>			<u>Buck:Doe</u>
					<u>Spike</u>	<u>Fork</u>	<u>+</u>	
LMC	376	151	188	80:100	15	12	10	1:5
PVT	142	31	96	32:100	6	3	6	1:6

The private land surveyed, 3 x 2 sq. mi., was located in the river bottom south of Victor Crossing. Buck/doe ratios on both areas were outstanding by state standards; however the fawn/doe ratio was not considered good, especially on the private lands. During drought years, cattle (or ranchers) put more pressure on riparian habitat. Lynn Neilson, state game biologist, felt the fawns were probably produced but lost due to lack of forbes for lactating females and young animals. The private land was very easy to survey as there was little or no cover.

During the aerial survey no deer were counted on the area north of the railroad tracks. The survey began at 8:00 am, and deer had not moved in from the bench areas to the east. At 8:45 am deer were just beginning to enter the refuge on the south eastern

corner. A good number of deer censused came from the residence area, which is no surprise, since this area is closed to hunting. The largest rack was observed on private land.

Mortality to the refuge herd is due to three major factors - hunters, automobiles, and coyotes. This year, 140 deer were taken; 57 by refuge hunters, 33 by hunters adjacent to the refuge, and another 50+ by automobiles. Hunter harvest was down by almost 50% this year. (See Sec. H-8.) None of our three "droptine" bucks were harvested. (See NR 87 for detail.)

Other: In April a cow moose was observed on the north end, and a cow and a calf were seen periodically in June. This area was used by a cow and a calf last year. During September a young moose was observed throughout the month. During the third week of November, 39 elk moved onto the refuge; one to three remained to years end.

#### 10. Other Resident Wildlife

Coyotes are seen frequently and are an essential component since they provide some control over our white-tailed deer population. Four dens were located this year. One bobcat was seen on 13 September in the north end.

River otter commonly use the refuge but are seldom seen. Two were observed in April and November on Pond 13, and one in May on Pond 4. Short-tailed weasels were frequently observed throughout the summer in the picnic area.

The first yellow-bellied marmot was seen 15 March, two days earlier than last year.

Ring-necked pheasant are abundant on the refuge. It is not uncommon to see 100 at a time in the fall and winter. Mild winters over the past four years and excellent habitat have contributed to the success of this bird. Pheasant hunting is not open on the refuge; however, refuge volunteers and the Ravalli County Fish & Wildlife Association trapped and transplanted birds to other valley locations. (See G-16)

The Christmas Bird Count was held 17 December. The day was clear and cold, with no wind, and a one to two inch snow cover. Most of the ponds and sloughs were frozen. A total of 43 species and 909 individuals were tallied. Last year the same number of species and 1,551 individuals were censused. This year less acres were covered and participation was down.

# 1988 CHRISTMAS BIRD COUNT

<u>Species</u>	<u>#</u>	<u>Species</u>	<u>#</u>
American Coot	4	Dipper	1
Tundra Swan (sick)	2	Killdeer	4
Canada Goose	220	Horned Lark	5
Blue-winged Teal	2	Belted Kingfisher	1
Green-winged Teal	15	Downy Woodpecker	1
Northern Pintail	18	Hairy Woodpecker	1
Mallard	320	Northern Flicker	5
American Wigeon	8	Pileated Woodpecker	1
Ring-necked Duck	18	Black-Billed Magpie	18
Lesser Scaup	1	Starling	12
Barrow's Goldeneye	1	Common Raven	3
Common Goldeneye	2	House Sparrow	25
Hooded Merganser	5	R.-Breasted Nuthatch	21
Common Merganser	2	W.-Breasted Nuthatch	3
Ring-Necked Pheasant	76	Marsh Wren	2
Great-Horned Owl	2	Am. Tree Sparrow	25
Bald Eagle	5	Song Sparrow	3
Northern Harrier	2	American Goldfinch	26
Red-Tailed Hawk	1	Evening Grosbeak	11
Rough-Legged Hawk	6	Rock Dove	17
Northern Shrike	1	Black-cap chickadee	30
		Dark-eyed Junco	19

## 11. Fishery Resources

Ron Skates, Fisheries Assistance, Kalispell, MT, completed his second field season collecting data to assess this resource.

This year 700 large mouth bass were marked with numbered tags. Less than 1% were recaptured during the tagging effort and subsequent removal for restocking. Water samples were taken from three locations. Preliminary results indicated the following:

pH..... 7.7 to 8.1  
 Alkalinity..... <100 mg/l  
 Hardness..... <100 mg/l  
 Tot. Susp. Solids.. <7 mg/l  
 Turbidity..... 1.8/ntu

Data is still being summarized and will be reported next year.

On 25 August, 200 largemouth bass were caught and transplanted by Montana Fish, Wildlife and Parks staff for use as brood stock. Half of the fish went to a state pond and half to a pond on Forest Service land.

On 25 July, Don Peters, Montana Fish Wildlife & Parks, and Henry shocked and collected fish at the intersection of Threemile Creek

and the refuge boundary to determine if there were any effects from the illegal application of xylene applied by the Supply Ditch Company on 20 July. Gills were affected, "burned", and several dead fish had been observed prior to this collection.

#### 15. Animal Control

This year three skunks were removed from the Hagen residence. Unlike last year, none were observed around the residence.

Five beaver were trapped by special permit from the picnic area.

#### 16. Marking and Banding

We received a band return on a mallard shot in the fall of 1987 in Idaho. The bird had been banded as an adult on 26 January 79!

This year 65 pheasants were banded and released on private lands in the valley. This is a cooperative effort between the refuge and the Ravalli County Fish & Wildlife Association. Refuge volunteers capture and band the birds and the Association provides bands, transportation, and release with good habitat. Mild weather conditions were not conducive to trapping, volunteers put in 110 hours.

#### 17. Disease Prevention and Control

On 14 March, an adult bald eagle was found dead at the feeding station. It was sent to Madison but results are not in.

Dead muskrats were observed on the bottom of Francois Slough in February and March. Two carcasses were collected and sent in to the state lab; however, they were too far gone to determine cause of death.

In the spring we continue to pick up several geese and ducks that appear to have died from lead poisoning.

One gosling was captured from a brood which appeared sick. The bird died in less than 24 hours and was sent to Madison. It had low body fat and a bacterial infection common to young animals.

### H. PUBLIC USE

#### 1. General

The Metcalf Refuge receives a tremendous amount of public use for its size. Wildfowl Lane, a county road traversing the south-central portion of the refuge, is the primary means of access to the refuge.

Public use and interest in the refuge has increased dramatically over the past ten years. The refuge is in close proximity to the



college town of Missoula, and the area surrounding Stevensville is considered a bedroom community of Missoula. The surrounding population is outdoor-recreation oriented and is placing increasing demands on outdoor resources. Since the refuge's inception, the populations of both Ravalli and Missoula Counties have increased substantially.

In 1988, three meetings were held with area teachers to assess environmental education needs in materials, programs and services. Information received from these meetings was used as a guide when we began intensive efforts to build on the education program launched in the fall of 1987. The program is directed at local teachers, sportsmen and Audubon groups. The support from the community has been outstanding.

## 2. Outdoor Classrooms - Students

In 1988, a total of 1771 students (49 groups) visited the refuge. Of these, 1183 students (33 groups) were involved in EE activities on the refuge independently of, or in combination with, guided or self-guided tours. Of this number 360 students (10 groups) were elementary and 823 students (24 groups) were junior high or high school. Compared to last year, these figures represent a slight increase in jr. high/high school level involvement in EE activities, but an astounding six-fold increase by elementary students.

## 3. Outdoor Classrooms - Teachers

In May a one-day teacher workshop was held to train teachers on the use of "outdoor classrooms". We received 120 applications for 60 openings! Discussions, educational materials, hikes and hands-on field exercises were all part of the day's activities. One unit of credit was offered through the University of Montana. Teachers were very enthusiastic and encouraged us to offer additional workshops.

Our workshops are an expansion of an education program begun at the Bison Range eight years ago. We work closely with the Bison Range staff and attempt to support and complement their efforts, offering more teachers more opportunities for EE experiences and another site for field studies.

A resource library was organized and is now available to teachers with reference material and activity ideas for classroom and field studies. Teachers who take the workshop for university credit are required to write and implement an environmental education lesson plan. The best of these are filed with the resource library. They have the advantage of having been field tested and written by teachers for teachers. The library is currently comprised of 23 folders covering 11 different subjects. It is housed at a local school library, and maintained by the school librarian.



5/88 MA  
Teachers erect tepees and build sweatlodges while learning about Native American culture, history, and natural history.



5/88 MA  
Teachers get wet, have fun, and enjoy lively discussions as they look for links in aquatic food chains.

#### 4. Interpretive Foot Trails

YCC, SYEP, U.S. Forest Service, and volunteers helped us construct two interpretive nature trails along the riverbottom woodland. These trails are open to the general public year-round, but will also draw teachers to specific areas for field studies - sites where they can use the information and skills acquired from the workshops. Along these trails we designated environmental study areas that are safe, accessible, and have minimum impact on wildlife and other resources. Interpretive natural history signs have been placed along the trail; others are planned. Local boy scouts are designing plant identification plaques to place along the trails.

#### 5. Interpretive Tour Routes

The majority of teachers who visit the refuge are now making more productive use of their time by electing self-guided tours, "hands-on" activities, or nature walks. This modification of the traditional guided tour has decreased pressure on areas where goose production is down.

Eighteen guided tours were given to 697 students: 615 (15 groups) elementary, 82 (3 groups) junior high and high school. In addition, tours were given to Japanese businessmen and their sponsor from the Mansfield Center, UM, U.S. Forest Service regional office personnel, 3 groups of cub scouts, 2 groups of boy scouts, the Victor Garden Club, and two senior citizen groups.

Self-guided tours are becoming increasingly popular among school groups. In 1988, a total of 813 students (23 groups) opted for self-guided tours. Of these, 126 students (4 groups) were elementary and 687 students (19 groups) were jr. high/high school level. Other self-guided tours included:

- \* University of Montana ornithology class - 3 tours (60)
- \* Five-Valley Audubon Chapter (15)
- \* Stevensville Saddle Club Ride (21)
- \* one group of cub scouts (8)
- \* Back Country Riders horse riding club - 2 tours (18)
- \* Missoula Hiking Club (16)

#### 6. Interpretive Exhibits/Demonstrations

An exhibit area has been set aside in the "White Barn" on the refuge that now houses a skull and skin collection, educational materials, field equipment, and projector and screen to enhance field studies. However, the room is not mouse, moth, or fly proof, which is posing some problems.

Text, pictures, and layout for three new interpretive signs have

been completed and will soon be ready for display along Wildfowl Lane. These 3x4 panels contain information on (1) riverbottom (riparian) habitat, (2) waterfowl plant food (divers and dabblers), and (3) wetland (water level) management.

A new panel on white-tailed deer arrived and was placed in the south kiosk along with existing information on the refuge and duck stamps.

Kid's Corner, a board display with questions and answers pertaining to refuge ecology, arrived in December. We plan to introduce the display to teachers during our spring workshop.

A refuge hunting leaflet was completed and will be available for distribution before the 1989 hunting season.

Films or slide shows were shown, or talks were given to the following groups:

January:	Garden Club, Retired Federal Workers, Ravalli County Sportsman's Group
February:	Women's Legion Auxiliary, Lone Rock School
March:	Eastern Star, Garden Club, North Valley Nursing Home, Kiwanis, Presbyterian Men, Golden Age, Victor First and Second Grades
April:	Masonic Lodge, Stevensville Nursing Home, Missoula Homeshcoolers Association, Professional Women's Group, University of Montana Wildlife Class
May:	Hamilton Second Grade, Hamilton Golden Age, Stevensville Seventh Grade, Hamilton Eighth Grade, Four elementary schools
June:	Kiwanis, Stevensville Business Women's Club, Univ. of Montana Students, Hamilton Golden Age
August:	Missoula Rotary
September:	Darby Garden Club
November:	Stevensville Third Graders
December:	Hamilton Women's Club; Sheila Morrison, refuge volunteer, showed 15 refuge staff, volunteers, and friends her wildflower slide program

## 7. Other Interpretive Programs

Three historical signs are located along Wildfowl Lane. The signs discuss "Salish Indian Ceremonial Grounds", the "Francois Slough Sweathouses", and the "Hanging of Whiskey Bill" - events that took place during the early 1800's. The plaque dedicating the refuge to Senator Lee Metcalf is also on this road.

The following is rare film footage of the Ghost of Whiskey Bill who was discovered by Russ, Josh, and Zach Anderson on their return from a night of hard core "Trick or Treating". After this incident, the children were not overly enthusiastic about driving past this tree after dark.





10/31      THE HANGING TREE      MA  
 A brief visit by the ghost of Whiskey Bill  
 was caught on film.

Whiskey Bill, William Graves, notorious murderer and horse thief was hanged by the Vigilantes in January 1864. They chose a site on the refuge because the Mission Indians would not permit hangings near the church. Luckily the ghost remained long enough for local newspapers to photograph and retell a very interesting piece of local history.

A Waterfowl Hunter Workshop held in August attracted 20 sportsmen. They were offered materials, information and demonstrations on hunting with dogs, duck calling and decoy setting, waterfowl identification, taxidermy, shooting steel shot, and hunter safety and ethics.

Two bowhunter safety classes were offered on the refuge and attended by sixty 14-18 year olds. Youth were instructed on safety, equipment, hunting techniques, field courtesy, and ethics. We plan to continue offering hunter education workshops. Our goals are:

- \* to reduce crippling losses
- \* to reduce the deer herd and encourage the harvest of does



- \* to improve the quality of the hunting experience by teaching responsible, safe, and ethical hunting.



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Our bowhunter safety classes encourage young people to become safe and conscientious hunters.

Twenty news articles were released during 1988. A regular monthly column, "On The Refuge", that was initiated in 1987 continues to keep local citizens informed about refuge activities. The following topics were addressed:

- \* Historical Accounts
- \* Trapping and Relocation of Pheasants
- \* Volunteer Recognition
- \* Land Acquisition
- \* Teacher Workshops
- \* Pot-Hole Blasting
- \* Shotgun Slug/Blackpowder Hunt
- \* Wildlife Profile of Canada Geese
- \* Natural History of the River Otter
- \* Archery Deer Hunting
- \* Waterfowl Hunting
- \* Swareflex Wildlife Reflectors
- \* Public Use - New Nature Trails, Interpretive Signs, Slide Programs
- \* Wildlife News - Update

These articles are also published in the local Audubon newsletters.

Three radio interviews and one TV interview were given on spring

migration, pothole blasting, hunting and signs.

In November an article on our education program was submitted for publication to the FWS NEWS. An application for the "Take Pride in America" award was submitted for our education efforts aimed at teachers and sportsmen.

A plant list for the refuge is being developed; over 200 species have been identified. Sheila Morrison, an energetic volunteer, has photographed nearly 100 species and developed a slide program with text. This excellent educational/interpretive tool and her forthcoming flowering plant leaflet will be available to teachers and local civic groups.

In 1988, the Five Valleys and Bitterroot Chapters of the Audubon Society jointly adopted the refuge. They are active in cooperative ventures with the refuge involving interpretation, education, and data collection.

Beginning in February the picnic area received regular use through spring, summer and fall, accommodating the greatest number during May when school field trips are at their peak. In June, the Salvation Army hosted a picnic for 40 children.

The Metcalf Refuge has been extremely fortunate to have the support and cooperation of local groups and many volunteers. Cooperative organizations include:

USFS	U.S. Forest Service
WARC	Western Agriculture Research Center, MSU, Bozeman
YCC	Youth Conservation Corporation
SYEP	Summer Youth Employment Program
MDFWP	Montana Department of Fish, Wildlife, and Parks
UM	University of Montana
MRA	Montana Riparian Association
NBA	National Bowhunters Association
RCFWA	Ravalli County Fish and Wildlife Association
RCHD	Ravalli County Highway Department
SE	Stevensville Elementary
BAC	Bitterroot Audubon Chapter
BRC	Bitterroot Rehabilitation Center
RMCB	Reserve Mobile Construction Battalion 1718-U.S. Navy

Local naturalists, teachers, artists, trappers, taxidermists and others with an interest in wildlife and public lands have donated time and/or materials to support the education/interpretation program at the refuge.

## 8. Hunting

### Waterfowl:

About 655 acres are open to waterfowl hunting for the entire season. All hunting in this area must be done from designated

blinds. Another 80 acres is open to jump shooting November 1 to close of season.

This year 22 blinds were available. Hunter selection is on a first come - first serve basis with the exception of opening weekend when a drawing is held. Only 46 hunters registered as compared to 128 in 1987. The sharp decline was due to a variety of reasons - the goose season opened the weekend before, bag limits and season length were more restrictive, steel shot requirements, harvest was poor last year, and the antelope season opened the same weekend.

The goose season opened 1 October and closed 1 January. There was a split season for ducks (8 Oct.- 26 Nov./24 Dec.- 1 Jan). Hunter visits decreased 33%, hours hunted by 27%, and ducks harvested by 41% compared to last year.

The number of birds crippled decreased by 22%, compared to last year; however, the rate of crippling increased 5%, which is low considering many hunters were using steel for the first time.

WATERFOWL HUNTER USE AND SUCCESS - LEE METCALF NWR

YEAR	# ACTIVITY			# BAGGED		#
	HUNTERS	HOURS	SHOTS	DUCKS	GEESE	CRIPPLES
1988	1,068	2,128	6,348	362	72 (2)	122
1987	1,588	2,930	5,718	618	59 -1-	156
1986	2,234	7,549	9,068	1,238	60 (1)	333
1985	2,108	6,654	6,888	971	85 (1)	191
1984	3,006	9,649	13,904	1,608	100	
1983	2,332	8,301	13,402	1,817	119	
1982	1,843	6,233	8,298	1,317	152	
1981	1,620	6,298	9,436	1,696	125	
1980	2,670	9,726	12,373	1,744	63	
1979	3,180	9,572	12,356	1,819	34	
1978	2,909	8,657	13,488	2,000	66 (2)	
1977	3,128	10,760	15,643	1,903	42 (2)	
1976	3,175	11,782	18,749	2,114	55 (1)	
1975	4,302	11,872	30,360	4,108	88 (1)	
1974	3,393	8,826	13,903	2,210	54 (2)	
1973	2,992	8,460	*	2,207	24 (10)	
1972	2,999	7,730	*	2,638	55 (20)	
1971	2,650	7,980	*	1,655	12	
1970	1,810	4,890	*	2,010	15	
1969	1,370	4,110	*	1,150	6	
1968	1,945	3,330	*	3,350	*	
1967	2,130	4,160	*	3,650	*	
1966	1,015	1,950	*	1,535	*	
1965	290	940	*	342	*	

( ) snow geese  
 - - white-fronted  
 \* no data

The goose harvest increased by 22%, with nearly half taken during the first weekend. Three parties of avid goose hunters set up at our gates two days prior to the opening in order to secure the best blinds. We do not hold a drawing for the goose season if it opens prior to duck.

#### Deer/Archery:

The refuge lies in State Hunting Area 260 - Deer Archery Only. Normally, there is a four and a half month season beginning on Labor Day. This year the season opening was delayed 10 days because of the severe fire danger. The season closed 15 January 89. Archers are permitted one buck and five doe tags in this area.

This year an additional 150 acres were opened to archery hunters on the north end for the entire season, and we again opened the waterfowl hunting area after 1 January.

The total number of deer harvested by bow hunters was 50; of which 31 were does. The late season harvest, 1 to 15 January, was similar to last years with 12 taken, 7 of which came from the waterfowl hunting area. Overall however, hunter use was down 34%, hours hunted by 40%, arrows released by 25%, and harvest by 51% compared to last year. Some of this decrease may be attributed to the 10-day opening delay, 550 acres on the north end were closed to archers for two weeks during the gun hunt, and elk hunting conditions and harvest were excellent this year compared to last. Last year elk hunters had very poor success, and after the close of season we were inundated with hunters.

#### DEER HUNTER USE AND SUCCESS - LEE METCALF NWR

<u>YEAR</u>	<u>HUNTERS</u>	<u>ACTIVITY</u> <u>HOURS</u>	<u>ARROWS</u> <u>RELEASED</u>	<u>#</u> <u>KILLED</u>	<u>#</u> <u>WOUNDED</u>
1988	1,297	3,143	315	50 (31)	68
1987	1,954	5,275	411	103 (75)	58
1986	567	1,858	185	36 (28)	33
1985	588	1,533	135	31 (20)	10
1984	585	2,692		20	
1983	538	1,386		28	
1982	659	1,754		33	
1981	1,001	2,797		68	
1980	641	1,707		13	
1979	736	2,579		19	
1978	357	936		7	
1977	414	1,170		9	
1976	274	1,029		7	
1975	301	810		6	
1974	270	628		5	
1973	210	635		4	

( ) Does taken

An additional 33 deer were harvested along our boundary , and another 50+ were taken by vehicles.

#### Deer/Gun:

This was the first year the refuge had a gun hunt for deer. Details of the hunt were closely coordinated with the Montana Department of Fish Wildlife & Parks. The following is a description of the program:

- Three, three day hunts were held in the 550 acre area north of the railroad tracks during the first two weeks of the general gun season.
- There were three days of closure between hunts.
- Ten hunters were selected for each hunt under special permits issued by the state.
- Shotgun slug/blank powder weapons for antlerless deer only.
- Each hunter could obtain two tags.

Hunter turnout was poor, and only 7 deer were taken. On the first day one hunter spent six hours and another two hours in the evening. No more than four individuals out of the ten made an appearance during the three days. No deer were harvested. During the second hunt five deer were harvested, two by one individual, and another two were taken by one hunter during the last hunt. A total of 22 hunters from 30 selected showed at one time or another; however, many of them only spent 2 to 3 hours hunting. Most hunters had purchased the two doe tags, showing a pre-season interest in harvesting. Our hunt was competing with the opening of general gun season, and as stated earlier, elk hunting conditions were excellent. By the third hunt, many hunters stated they had plenty of meat, so perhaps they were less enthusiastic. There were also folks who had never hunted whitetails before and seemed to be under the impression they would be like mule deer. In any case both refuge and state personnel were surprised at the outcome. Next year we plan to open the refuge gun season prior to the general season.

#### 9. Fishing

The area open to fishing consists of one small oxbow and the shoreline of the Bitterroot River. Most fishing is done by grade school kids or senior citizens. This year, fishing pressure was light, primarily due to low water levels.

Interest from both the general public and the State to open refuge ponds for bass fishing still exists. Inquiries are being put on hold until completion of the fishery study.

#### 11. Wildlife Observation



Annually about 20,000 activity hours are logged under this heading, the majority of which occurs from vehicles on Wildfowl Lane. The remainder occurs primarily by foot along Wildfowl Lane or in the picnic area. Horseback riding, jogging, and bicycle riding along the county road are becoming increasingly popular.

#### 14. Picnicking

The picnic area along the Bitterroot River includes four picnic tables and one outhouse. This area was expanded from 80 acres to 140 when the Murphy tract was acquired. The area is typical of riverbottom woodland. A seasonal pond and a stream surrounding the picnic area provide visitors and school groups a place to fish, hike, play and observe nature. This year the YCC enhanced the area with construction of two nature trails with interpretive signs.

#### 17. Law Enforcement

The following is a summary of law enforcement efforts in 1988:

<u>Violation</u>	<u># Apprehended</u>	<u>Disposition</u>	<u>Amount</u>
General Trespass*	12	Citations 10 Warning 2	200.00 Pending (6)
Use of Artificial Lights	2	Citations 2	200.00
Fishing Closed Area	2	Citations 2	100.00
Waterfowl			
-Take Before Hrs	1	Citations 1	50.00
-Shoot before Hrs	1	Warning 1	
-Shoot after Hrs	2	Citations 1 Warning 1	50.00
-Invalid license (No duck stamp)	1	Citations 1	50.00
-Unplugged shotgun	2	Citations 2	200.00
-Take upland game bird in closed season	1	Citations 1	50.00
-Too many shells in possession	3	Warning 3	
Deer			
-Hunting w/gun in closed season	1	Citations 1	100.00
-Invalid license	1	Citation 1	25.00
-Sp. Regs./Improper Access	2	Citations 2	100.00
Reckless Driving	1	Citation 1	50.00

This was the first year the use of steel shot was required for waterfowl hunting. Compliance was excellent, and we heard very few complaints.

Several break-ins occurred at the Reynold's barn, two in March, and one at the shop on 27 December. Mischief and a minimal amount of vandalism, less than \$200.00 damage, seemed to be the primary goal, although several tools were lined up behind the barn on one occasion.

We experienced some "creative vandalism" at the north end Kiosk. No damage was done to our facility, but periodically throughout the summer if you got too close to it, your eyes and nose suffered some damage.



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Just one of six deer and three skunk  
dropped off at the north end KIOSK.

## I. EQUIPMENT AND FACILITIES

### 2. Rehabilitation

Construction began on the rehabilitation of three small pair ponds on 19 September and was completed by the end of November. Funding, \$25,000, was provided by the Montana Power Company as mitigation losses for an acre of wetland destroyed for a new kofferdam. Ducks Unlimited provided the engineering expertise and administration for the entire project. (see Sec. F-2)

In May the middle section roof of the Reynold's barn was resingled.

The irrigation pumphouse located near the Power Substation was replaced in December. We have been trying to slowly upgrade the irrigation equipment and facilities. We suffered a major set back when Cooperative Farmer, McElhaney, notified us that all the pipe, pump and the 'old' house located at the substation site belonged to him. This accounts for 25% of all irrigation equipment on station. At this time funds are not available to replace that unit.

### 3. Major Maintenance

YCC removed old fencing and erected new on the newly acquired 80-acre Murphy Tract. The Seabees placed 18 cys of gravel on the north end, bowhunter parking lot, and YCC made the walking cattle bender wheelchair accessible.

In July we completed painting the exterior of the Reynold's Barn. Missing windows were replaced, and new interior lights and shelves were installed for the museum. Improvement of this building began last year. The Seabees, YCC, volunteers and refuge staff were all involved.



1986

Before.

MA





1988

After.

MA

#### 7. Energy Conservation

Two cracked fiberglass overhead doors were replaced with Thermospan 150 doors. These doors have an R13 value, are much more energy efficient, and provide greater security to the facility.

A thermopane sliding door at the quarters was also replaced.

#### 8. Other

The excess 1951 Caterpillar grader was donated to the Lake County Airport in Pablo on 16 October.

In September all refuge gate locks were changed, and in December all locks were changed at the shop and oil house.

A small portable water pump was purchased for wildfire use for areas inaccessible to vehicles.

### J. OTHER ITEMS

#### 1. Cooperative Programs

Anderson continued as a member of the Bitterroot Valley Landowner - Sportsman Committee. The Montana Department of Fish, Wildlife and Parks initiated these committees to provide a means of direct communication between landowners and recreationists and an opportunity for joint problem solving of issues at the local level.

#### 3. Items of Interest

A refuge revenue sharing check totaling \$8,734.00 (59%) was delivered



to the county in April.

During the year, Regional Office Staff, Mike Hines, Barney Schranck, Ralph Fries, Betty Adler, Steve Berlinger, Dave Janes, and Debby Burton were on station.

Bruce Beard, OMB, Washington Office, spent five hours on the refuge on 19 July.

#### 4. Credits

Report: B. Underwood - H 1-7, 9, 11, 14,  
P. Fehr - E 1, 4, 5, 6, 8; H 17  
M. Anderson - remainder

Editing: Anderson/Fehr



7/87

Denver Holt

So often we seem to be heading in two many directions - if we aren't careful we just might croak! Till next year, stay cool!