

MCARTHUR LAKE
Wildlife Management Area

Management Plan
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Idaho Department of Fish and Game
Panhandle Region
2750 Kathleen Avenue
Coeur d'Alene, Idaho 83815

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FOREWORD

A key element of wildlife management in Idaho involves managing land and water - the habitat base required for all fish and wildlife species. Providing public access for hunting, fishing, trapping or simply viewing wildlife is also an integral part of this state's wildlife management program.

In order to provide habitat for fish and wildlife species and public access, the Idaho Department of Fish and Game (Department) has developed a system of Wildlife Management Areas on Department-owned or managed lands throughout the state.

This document is the plan for the McArthur Lake Wildlife Management Area (WMA) in Boundary and Bonner counties and replaces the previous plan adopted in 1985. The plan supplements the Department's Policy Plan 1990-2005: A Vision For The Future.

The reason for this planning effort is to ensure long-term protection and management of fish and wildlife resources on Department property within biological limits, economic, social and manpower constraints.

Management goals have been identified as well as those issues the Department believes could affect achieving the stated goals and ongoing management activities. Finally, objectives and strategies are proposed to deal with these issues.

Data used in this plan were those available through the summer of 1998. This plan should be viewed as a guideline for land and resource management decisions that will periodically be subject to change as new data regarding fish and wildlife resources, hunters, anglers, and other segments of the public become available.

Open house scoping sessions were held in Sandpoint on March 21, 1996, and Bonners Ferry on March 27, 1996, asking the public to assist the Department in identifying issues that needed to be discussed in formulating the McArthur Lake WMA Plan. Another series of open houses were held in Sandpoint on October 29, 1996, and Bonners Ferry on October 30, 1996, asking the public to assist the Department in formulating objectives and strategies to address issues previously identified. Public participation was invited by paid advertisements in local newspapers, flyers were posted at local businesses and the post office, and 100 personal letters were mailed to individuals, groups, government entities and elected officials with a stake in the future of the WMA.

INTRODUCTION

Location

The McArthur Lake WMA is located adjacent to US Highway 95, approximately 18 miles north of Sandpoint, Idaho and 13 miles south of Bonners Ferry, Idaho (Figure 1). The majority of the WMA is in Boundary County. The remainder of the WMA is in Bonner County. The nearest population centers are Sandpoint and Bonners Ferry.

Purpose

This WMA was one of Idaho's first land purchases using Pittman-Robertson funding. The WMA was acquired to provide waterfowl breeding, nesting and summer-fall use areas to replace marshlands converted to farmland in the nearby Kootenai River Valley. An important aspect of the WMA is providing the public with opportunities for waterfowl and big game hunting, fishing and wildlife viewing.

HISTORICAL PERSPECTIVE

Early History

Before settlement by Americans of European descent, McArthur Lake was a natural wetland situated at the confluence of Deep and Dodge creeks. Following completion of the Great Northern Railroad in 1892, an influx of loggers, miners, and homesteaders led to the development of the McArthur settlement and school for which McArthur Lake was later named. By 1933 the McArthur Lake wetland had been drained for hay and crop production.

Acquisition and Development

The first land acquisition was completed in 1942. The original property consisted of a wetland dissected by meandering channels of Deep Creek and Dodge Creek. Development activities began in 1944 with the construction of an earthen dam and a wooden spillway that created a 200 acre reservoir.

Further land acquisitions in 1964 enabled the Department to replace the original dam with a larger structure. In 1965, the dike was raised and a major concrete dam, spillway and fish bypass were constructed. This increased the potential impoundment area of the reservoir to its present size of 600 acres. In order to maximize water storage capabilities, additional lands and flowage easements were purchased through 1974. The Department's ownership presently consists of 1,207 acres.

Other development activities have included long term maintenance of hay fields to provide both goose brooding pastures and dense nesting cover for upland nesting duck species. More than a half-mile of channels has been excavated along the northwest margin of the reservoir to provide nesting islands for waterfowl.

MCARTHUR LAKE WMA MAP

Figure 1. Map of McArthur Lake Wildlife Management Area

In 1977 a new shop and storage building were completed. A new residence for the WMA manager was built in 1981. Major repairs to the concrete dam, spillway and fish bypass were completed in 1988 and 1994.

Appendix A outlines the Department's acquisition of the WMA and Appendix B contains a brief listing of developments and management actions on the WMA.

DESCRIPTION OF RESOURCES

Geographic Features and Climate

The most prominent feature of the WMA is a 600-acre shallow impoundment created by a dam constructed on Deep Creek. Deep Creek flows into the reservoir from the south and Dodge Creek enters from the northwest. From the concrete dam, Deep Creek flows north to join the Kootenai River which eventually joins the Columbia River.

The reservoir lies at an elevation slightly over 2,000 feet in a glacial depression left by the ice sheet that occupied and formed the Purcell Trench approximately 10,000 years ago. Soils on both sides of the wetlands are primarily well drained, fine sand loams. The wetlands have deep layers of peat. The reservoir is shallow, no more than 10 feet at its greatest depth.

The area has a typical Pacific Northwest climate of cool wet springs, dry moderate summers, cool wet autumns, and relatively long winters. Temperatures range from above 100°F. to - 40°F. Snow depths of up to eight feet have been recorded, but two feet is normal. The growing season is approximately 80 days. The annual precipitation is roughly 25 inches – about half-received during the winter. Freeze-up of the lake usually occurs the first part of November. "Ice-out" occurs in March or early April. Ice depths are at least eight inches.

Vegetation

WMA wetlands include emergent vegetation such as cattails, bulrush, sedges, rushes and spike rushes; and aquatic vegetation such as pond weeds, Elodea, coontail, and milfoil. Due to the shallowness of McArthur Lake, it is almost entirely vegetated with aquatic plant species. Grassy shorelines include reed canary grass, managrasses, and red top. Streams entering the reservoir are lined with alder, dogwood, cottonwood, willow, and birch. Tree species found within the WMA boundaries include ponderosa pine, Douglas fir, western larch, lodgepole pine, grand fir, western white pine, western red cedar, western hemlock, Engelmann spruce, black cottonwood, and quaking aspen.

McArthur Lake has been identified as one of 45 significant peatland sites in the Idaho Panhandle. Peatlands are generally defined as wetlands with waterlogged substrates and at least 30 cm of peat accumulation.

The McArthur Lake peatlands have been classified as a marsh like cattail/sedge rich fen occurring on floating mats. This peatland is rich in nutrients and dominated by sedges, cattails, bulrush, true mosses and shrubs. Rare plant species associated with McArthur Lake's peatlands include small yellow lady's slipper, green-keeled cottongrass, dwarf birch and slender spikerush.

Waterfowl

Prior to its purchase, the property now encompassed by McArthur Lake WMA served only as a resting area for migrating geese. Canada goose production on the WMA increased dramatically from one brood observed in 1957 to a peak of 117 active nests and over 300 goslings produced in 1982. Since that peak year, the number of nests has declined over 50% (Table 1). Raven predation on nests may be partially responsible. However, intense competition for nest sites at McArthur Lake may have caused less dominant pairs to pioneer new nesting territories. Canada geese are now common nesters all over Boundary and Bonner counties where suitable habitat exists, and McArthur Lake is no longer the major goose production area it once was.

Geese usually leave the WMA soon after the waterfowl hunting season opens and return in mid-February, about a month before the ice melts off the reservoir. Approximately 125 elevated nesting platforms are well received by nesting geese. Ground nesting also occurs on floating mats of vegetation and small islands created by excavation. They select nest sites during March and goslings start hatching the last week of April or the first week in May. Goslings usually are flying by mid-July. Coyote predation is the greatest gosling mortality factor on the WMA.

Approximately 25 acres of grasses/legumes are maintained for goose pasture. Another 100 acres of rank grasses and sedges are available along the northwest shore of the lake, primarily for upland duck nesting habitat.

Canada geese have been banded each summer at McArthur Lake since 1973. Band recovery information indicates that McArthur Lake geese are taken by hunters in seven western states and two Canadian provinces. Fifty-three percent of all returns come from geese shot in the five northern counties of Idaho. Since 1988 the mean direct recovery rate of geese banded at McArthur Lake has been 5.8 percent.

Thirteen species of ducks are known to breed at McArthur Lake producing an average of 286 ducks annually (Table 2). About 50 percent of the WMA's wood duck nesting boxes are occupied each spring by either wood ducks, common goldeneyes, or hooded mergansers. Up to 6,000 migratory ducks visit the area during the spring and fall.

There has been no incidence of waterfowl disease problems on the WMA.

Big Game

Big game species on McArthur Lake WMA include white-tailed deer, moose, black bear, elk, mule deer, and mountain lions. White-tailed deer are abundant, occupying the WMA year-round. Moose are also common residents. However, they are most observable during June when they feed daily on aquatic vegetation in McArthur Lake. Up to six moose at one time have been observed. Cow moose with calves are commonly observed during summer. Black bear are

frequent visitors in the spring feeding in wetland habitat on the southwest portion of the WMA. Elk use the WMA infrequently, mostly during winter. Mule deer and mountain lions are uncommon visitors.

White-tailed deer, moose, and black bear are frequently hunted on the WMA.

Furbearers

Interest in trapping on the WMA has declined over the years due to low fur prices and declining muskrat populations. Muskrats used to be the most abundant furbearer on the WMA. However, for unknown reasons muskrats have declined coincident with reduced trapping pressure. Mink are present on the WMA in relatively low numbers. Beaver are abundant particularly where Deep Creek meanders through wetlands prior to entering the reservoir. Up to four otters have been observed in McArthur Lake at one time. Otters are most observable during winter when they bring fish to holes in the ice where they feed. This activity often attracts bald eagles to the ice holes.

Other Game Species

Ruffed grouse, common snipe, mourning doves, and snowshoe hares are common although not abundant, game species on the WMA. American coots breed and nest on the WMA and occasionally number over 1,000 during migration. Merriam's turkeys are frequent visitors.

Non-Game Wildlife

A pair of bald eagles has nested on the WMA continuously since 1988. They have successfully fledged young seven of the last ten years. Other nesting non-game birds include pied-billed and red-necked grebes, sora and Virginia rails, black terns, osprey, red-tailed hawks, and a diverse array of other migrant and resident birds.

In addition to breeding wildlife, McArthur Lake supports many species during migration. Notable among these are the shorebirds which begin to utilize McArthur Lake in mid to late July as the reservoir is drawn down. Common shorebirds include spotted, solitary, and western sandpipers, killdeer, long-billed dowitchers, and greater yellowlegs.

Fisheries

McArthur Lake provided a popular fishery primarily for wild rainbow trout, stocked brook trout and largemouth bass until the early 1970's. Due to its shallow depth, rooted aquatic plants became firmly established and the lake has slowly filled in from partially decomposed vegetation. Each year by mid-summer the lake is now entirely covered with aquatic vegetation. The quality of fish habitat has declined as a result and the current fishery consists primarily of bank angling near the dam for yellow perch and pumpkinseed sunfish.

In an effort to control competition from perch and pumpkinseeds, the reservoir was chemically treated in 1977 and later restocked with brook trout. However, within two years perch and pumpkinseed populations recovered to their former levels. Other attempts to diversify the warmwater fishery by stocking largemouth bass and black crappie were unsuccessful.

A spawning run of rainbow trout from the Kootenai River and lower Deep Creek continues to migrate over the dam and through the reservoir each spring heading for the upper reaches of Deep Creek and Dodge Creek. However, their numbers have declined over time.

PUBLIC USE

The WMA receives considerable use from local residents fishing for perch near the dam. Waterfowl hunting is also popular at McArthur Lake until freeze-up, usually in November. The WMA is also frequently hunted for white-tailed deer, black bear, and moose. Many people visit the WMA to view wildlife, particularly in June for moose, and during peak bird migrations in spring and fall. The annual public use at McArthur Lake WMA is estimated to be 2,200 visits. Public use estimates by season are displayed in Table 3.

MANAGEMENT GOALS AND ONGOING ACTIVITIES

The following goals have been developed to guide management at McArthur Lake WMA. The goals are responsive to the identified issues, the purpose for which the WMA was originally acquired, and the Department's 1991-95 Waterfowl Management Plan.

1. Develop and manage wetlands for waterfowl production.

Canada Goose Management:

- Maintain stable water levels during the nesting period to prevent flooding nests.
- Maintain up to 125 nesting structures annually.
- Replace, relocate and add new nest structures.
- Prohibit fishing from boats from March 15 to June 30 to prevent disturbance of breeding and nesting waterfowl.
- Maintain approximately 25 acres of goose pasture to provide secure feeding areas for breeding geese and their broods.
- Reseed grass/legumes pastures when necessary.
- Continue annual noxious weed control program.
- Document beneficial use of water rights.
- Annually evaluate raven and coyote predation and implement control measures when warranted.
- Monitor nesting Canada geese through an annual nest census. The goal for McArthur Lake is 100 nesting pair.
- Band locally produced Canada geese to estimate harvest rate and determine wintering habitat.

Duck Management:

- Maintain stable water levels during the nesting period to prevent flooding nests.
 - Provide and maintain good quality upland nesting habitat adjacent to wetlands.
 - Reseed upland duck nesting habitat when necessary.
 - Maintain 45 wood duck nest boxes and inspect them for nesting success.
 - Document duck productivity and total production through breeding pair counts and brood counts. The statewide goal is 30 broods/100 pairs.
 - Band locally produced ducks to estimate harvest rate and determine wintering habitat.
2. Provide wildlife-related recreation, particularly public hunting, fishing and wildlife observation.
 - Maintain access site facilities - parking area, outdoor restroom, fishing docks and boat ramp.
 - Randomly monitor hunters and fishermen for regulation compliance and hunting/fishing success.
 3. Enhance and manage wetland and upland habitats for a variety of nongame wildlife species.
 - Maintain secure nesting conditions for bald eagles and ospreys.
 - Monitor bald eagle nesting success.
 - Allow a gradual, partial drawdown of the reservoir in late summer to produce and concentrate invertebrates used by migrating shorebirds as a food source.
 - Conduct timber harvest activities to maintain or improve wildlife habitat.
 4. Provide habitat for migrating waterfowl.
 - Fill the reservoir each spring to maximize the flooded area.
 - Allow a gradual, partial drawdown of the reservoir in late summer and early fall to produce and concentrate invertebrates for a food source, and provide duck loafing areas.
 - Monitor the WMA for waterfowl disease outbreaks.
 5. Provide habitat for white-tailed deer, moose, black bear, and elk.
 - Include plant species palatable to big game in mixtures for reseeding upland duck nesting habitat.
 - Limit motorized access to minimize big game disturbance or displacement.
 - Continue annual noxious weed control program.
 - Conduct timber harvest activities to maintain or improve wildlife habitat.

ISSUES, OBJECTIVES, AND STRATEGIES

The following management issues were identified jointly by the Department and the public. Objectives and strategies were then developed in an attempt to address these issues while still meeting the goals driving management on the WMA. Wherever possible strategies are quantified to assist the Department and public evaluate plan accomplishments.

Issue 1: Some fishermen question the need for boating restrictions during the waterfowl nesting season (March 16 through June 30).

Objective: Protect breeding and nesting waterfowl from angler disturbance.

Strategies: While fishing makes up much of the public use of the area, McArthur Lake was originally purchased as waterfowl habitat. Developing and managing habitat for waterfowl production is the primary goal of the WMA. Waterfowl nest abandonment due to disturbance by fishermen is well documented. Reduced human-caused disturbance associated with the current regulation also benefits other wildlife such as nesting bald eagles, and migrating waterfowl. Fishing is allowed year-round near the boat ramp, and in remaining areas through the rest of the year. There are many area lakes currently open to boats in the early spring while McArthur Lake is the only lake in northern Idaho with a breeding/nesting season closure to limit waterfowl disturbance.

Issue 2: The spread of noxious weeds has the potential to decrease the quality and quantity of wildlife habitat on the WMA.

Objective: Convert WMA fields to desirable perennial plants using funding from the Department's Habitat Improvement Program.

Strategies: Fields at McArthur Lake had not been cultivated for over ten years allowing common tansy and other weeds to become well established. Noxious weeds take over sites that could be occupied by desirable vegetation that provides wildlife forage or cover. Weeds on the WMA may also spread to adjoining ownerships.

WMA fields will be sprayed with herbicide, cultivated for approximately one year, and reseeded to desirable plant mixtures. The first field in this phased process was treated with herbicide in 1995 and was cultivated in 1996. Treatment of other fields began in 1997. Cultivation and reseeded will extend through 1999. Noxious weeds in other locations will be either mowed to prevent seed maturation, or spot sprayed with herbicide. Targeted weeds include common tansy, spotted knapweed, Canadian thistle, and orange hawkweed.

Issue 3: Predation on Canada goose eggs and goslings can be severe. However, predator control is unpopular with some members of the public.

Objective: Evaluate raven and coyote predation annually and implement control measures when necessary.

Strategies: Observations by Department personnel indicate that ravens are capable of considerable waterfowl nest destruction at McArthur Lake. In addition, coyotes may prey heavily on Canada goose goslings.

Pre-baiting with unpoisoned chicken eggs in artificial nests will be utilized to determine if raven control through use of DRC-1339 is warranted. DRC-1339 is a selective poison for ravens, crows, and certain other birds. If warranted, the poison will be injected into chicken eggs and left for ravens in artificial nests. The artificial nests will be monitored 100% of the time to insure that non-target species are not affected. The poisoned eggs will be retrieved each day following use. In this way, DRC-1339 is further selective for only those ravens that prey on eggs. Use of DRC-1339 will be implemented with assistance from Animal Damage Control personnel.

Fields that are maintained as goose pasture will be monitored for coyote activity prior to goose nest hatching. If warranted, Animal Damage Control will be contacted to initiate coyote trapping. Trapping will be terminated before moose calves or deer fawns are born to prevent accidental trapping mortality on these species.

Issue 4: Periodic drawdowns of McArthur Lake to enhance and restore wetland habitat for migrating waterfowl and shorebirds limits the ability of the lake to maintain a fishery and makes public access for fishing and hunting difficult.

Objective: Manipulate water levels to maintain and restore wetland productivity.

Strategies: Considerable research exists indicating that if a marsh is inundated for many consecutive years, productivity declines; negatively impacting wetland plants and associated wildlife including waterfowl. Complete drawdowns allow decomposition of aquatic vegetation, freeing nutrients for plant and animal production.

In addition to complete drawdowns, moist soil plants can be produced for waterfowl food by a partial drawdown, followed by re-flooding in time for the fall migration. In July, shoreline areas are exposed through a partial drawdown. Moist soil plants germinate in the newly created mudflats and produce an abundance of seeds. The mudflats are then re-flooded to make seeds, and invertebrates available to migrating waterfowl as a food source. Drawdowns mimic conditions that periodically occur in natural wetlands during dry periods.

When the lake is completely drawn down, the resident fishery is almost completely lost. Some species, primarily yellow perch and pumpkinseed sunfish survive the drawdown by seeking refuge in the original channels of Dodge and Deep creeks. Others overwinter in Deep Creek below the dam and re-enter the lake when the fish ladder is opened in the spring after the lake has refilled.

Complete drawdowns will be conducted at McArthur Lake once every five to ten years. The lake will be re-flooded in the early spring to prevent impacting nesting Canada geese and bald eagles. Partial drawdowns to produce moist soil plants for waterfowl food will be employed periodically in interim years when Department personnel believe it is necessary.

Issue 5: Some members of the public do not believe the Department should be harvesting timber on Wildlife Management Areas.

Objective: Conduct timber harvest activities such that wildlife habitat management objectives are achieved, particularly the maintenance of large diameter trees.

Strategies: Timber harvest can produce revenue for Department operations. Wildlife habitat in some areas may also benefit from specially designed harvest prescriptions to achieve a predetermined end result. For example, historically the area around McArthur Lake supported widely spaced stands of large ponderosa pine. Large diameter trees are valuable to a wide array of wildlife as nesting and foraging sites. Timber harvest activities can be designed to maintain or restore historical conditions such as large diameter trees.

- Prepare a forest management plan for the entire WMA by June 1999.
- Protect the bald eagle nest from timber harvest activities.
- Maintain forest canopy for wintering white-tailed deer.
- Use existing roads/trails for haul systems wherever possible. Avoid the establishment of new roads/skid trails which could develop into unregulated foot/horse/bike trails.
- Space timber harvest entries over extended periods of time (3+ years).
- Isolate timber harvest activities to one area for each entry. Avoid dispersing harvest activity throughout the WMA on any given entry.
- Attempt to impact no more than 10% of the WMA on any given entry.
- Avoid the creation of large openings during timber harvest activities. Where openings are unavoidable (landings, skid trails, road, etc.), create the smallest opening required.
- Maintain a minimum of 10 snags or snag replacement trees per acre placing emphasis on large diameter snags (20 inches DBH).

Issue 6: McArthur Lake no longer provides the fishery for large brook trout and largemouth bass that it once did. Local residents frequently ask what can be done to restore the fishery.

Objective: Attempt to control the growth of aquatic vegetation in heavily fished areas and enhance perch growth.

Strategies: While fishing is still a major part of the public use at McArthur Lake, options for restoring or improving the quality of the fishery are limited.

The lake is very shallow, now averaging 3-4 feet deep. Due to the shallow depths, the lake supports a dense growth of aquatic vegetation. Each year the vegetation dies back but never completely decomposes and adds another layer of organic matter on the bottom making the lake even shallower. Eventually, the lake will become a marsh incapable of supporting fish year-round except in a few spots where springs occur and during spring runoff when the lake is full and new aquatic plant growth has just started.

Total drawdowns of the lake every five to ten years are the only way to facilitate decomposition of organic matter on the lake bed. This will slow down the rate of deposition in the lake but will not restore the lake to its former depths. Draining the lake also means the loss of most of the fish for at least a year. Periodically reducing the perch population may be beneficial. Currently perch are over-abundant and do not grow very large. A periodic loss of most of the fish in the lake should allow the survivors to grow larger.

The deepest part of McArthur Lake occurs directly behind the outlet dam spillway where the drainpipe is located. Fishing docks are located adjacent to the spillway since most angler activity occurs here. In September 1995, large fiber mats were placed on the lake bottom around the docks in an attempt to cut down the growth of aquatic vegetation and make it easier to fish.

Yellow perch and pumpkinseed sunfish will be the primary species available for fishing. These species can survive a total drawdown of the lake. Many of them overwinter in Deep Creek below the dam and will re-enter the lake in March when the fish ladder is opened up.

The fish ladder bypassing McArthur Lake Dam was totally rebuilt during the 1994-95 winter. Rainbow trout migrating from the Kootenai River and lower Deep Creek in the spring are once again able to get past the dam and move through the lake to the upper reaches of Deep Creek and Dodge Creek to spawn. These fish are available for harvest before they leave the lake. The fish ladder will be operated to provide bypass flows from mid-March through the end of June.

Issue 7: Due to the lack of disturbance such as fire, many shrub and grass stands at McArthur Lake have declined in their value for wildlife forage and cover.

Objective: Use prescribed burning in the spring once every five to ten years to rejuvenate shrub stands and grass stands in need of treatment.

Strategies: Prescribed burns will cause sprouting in shrubs to provide more palatable forage for deer, elk, and moose. Removal of many years of accumulated dead plant material will diversify and rejuvenate marsh and grass habitats. In order to avoid impacts on upland nesting ducks, only a small portion of the WMA would be burned in any one year.

Issue 8: Waterfowl, deer, moose, and elk can benefit from the establishment of annual grain food plots. However, if grain is planted, the area ceases to provide upland duck nesting habitat.

Objective: Evaluate wildlife use of grain foodplots in those fields that are planned for eventual reseeding to perennial plant species.

Strategies: Wildlife use of temporary grain fields will be evaluated. If significant benefits to waterfowl and big game are noted, some areas may be maintained as long-term grain food plots.

Issue 9: McArthur Lake WMA lies within an area that links the Cabinet Mountains to the Selkirk Mountains due to the narrow width of the Purcell Trench. Wildlife movement between the mountain ranges is important for long-term population viability through genetic exchange, particularly for uncommon or rare species such as wolverine and grizzly bear which have been recorded near McArthur Lake. Excessive human development or disturbance in this area may limit use by sensitive wildlife.

Objective: Limit long term development or disturbance that may impact use of the WMA by rare wildlife species.

Strategies: McArthur Lake WMA will be maintained in a roadless condition wherever possible. The road in the southwest portion of the WMA will remain closed to motorized vehicles.

Issue 10: McArthur Lake WMA supports several plant species that are considered rare. The potential impacts of management activities on these plant should be assessed.

Objective: Protect and maintain habitat for rare plants.

Strategies: Department personnel familiar with management of rare plants will be consulted prior to implementation of major management activities. Potential mitigation or avoidance measures will be incorporated into planned management activities whenever possible.

Issue 11: Some members of the public believe the Department should place more management emphasis on nongame species.

Objective: Increase public awareness of current nongame management and incorporate new nongame management methods as they are developed.

Strategies: Current management includes protection of the existing diverse array of WMA habitats. Part of the objective of gradual late summer drawdowns is to concentrate and produce invertebrates as a food source for shorebirds. Long-term benefits from partial and complete drawdowns will accrue to all wetland plants and animals.

Unfortunately, most nongame species are poorly studied and few management techniques are known. However, the Department is anxious to learn of, and employ, new nongame management techniques within budgetary and personnel time constraints. The Department will seek assistance in assessing nongame resources and implementing those management techniques that are necessary or feasible.

Table 1. Canada goose nests counted at McArthur Lake WMA since 1989.

Year	Number of Nests
1989	92
1990	86
1991	89
1992	56
1993	52
1994	53
1995	24
1996	39
1997	23
1998	33

Table 2. Ducklings observed during brood counts on McArthur Lake WMA since 1992.

Species	Ducklings observed						
	1992	1993	1994	1995	1996	1997	1998
Mallard	62	73	96	85	35	105	106
Gadwall	13	18	11	11	16	0	15
American Widgeon	56	24	21	19	34	43	19
Green-Winged Teal	4	0	0	0	0	0	4
Cinnamon/Blue-Winged Teal	27	15	11	14	2	38	5
Shoveler	0	3	3	0	0	0	0
Wood Duck	83	105	78	64	84	131	46
Ring-Necked Duck	10	28	4	0	27	50	100
Common Goldeneye	2	6	8	6	16	17	22
Hooded Merganser	0	5	11	4	17	5	4
Northern Pintail	0	0	0	0	0	5	7
Redhead	0	0	0	0	0	16	15
Unknown	12	13	0	5	0	1	0
Total	269	290	243	208	231	411	343

Table 3. Public use estimates at McArthur Lake WMA.

Use	Spring	Summer	Fall	Winter	Total
	Apr-Jun	Jul-Sep	Oct-Dec	Jan-Mar	
Fishing	365	550	185	20	1,120
Hunting	50	30	640	10	730
Bird Watching	50	30	100	10	190
Other	50	50	50	10	160
Totals	515	660	975	50	2,200

APPENDIX A
LAND AND WATER CONTROL

LAND ACQUISITIONS:

<i>Year</i>	<i>Funds Used</i>	<i>Acres</i>	<i>Acquired From</i>
<u>Boundary County</u>			
1942	P-R	769.41	Seattle First National Bank
1964	F&G	12.12	Pat H. McCurdy
1964	F&G	58.34	Jim D. White
1964	Exchange	21.00	Joslyn Mfg. & Supply Company
1968	P-R	9.20	Doyle W. Dutson
1971	F&G	9.40	Frank Kerns, Jr.
<u>Bonner County</u>			
1964	P-R	197.43	Robert J. Minnich
1974	F&G	130.00	Brooks G. Tessier
Total WMA		1,206.90	

FLOWAGE EASEMENTS:

<i>Boundary County</i>	<i>Year</i>	<i>Funds Used</i>	<i>Acres</i>	<i>Acquired From</i>
<u>Boundary County</u>				
	1969	F&G	5.37	Forrest M. Keister
	1971	F&G	1.60	Frank Kerns, Jr.
	1972	P-R	7.00	Retained from Dutson
<u>Bonner County</u>				
	1964	None	23.13	Robert J. Minnich
Total WMA			37.10	

ROAD EASEMENTS:

<i>Boundary County</i>	<i>Year</i>	<i>Funds Used</i>	<i>Acres</i>	<i>Acquired From</i>
<u>Boundary County</u>				
	1996	Exchange		David Mendendall

WATER RIGHTS:

<i>Water Right No.</i>	<i>Priority Date</i>	<i>Amount</i>	<i>Purpose</i>
1) 98-2140	11/3/45	10.0 cfs	Propagation of migratory waterfowl and fish.
2) 98-2141	12/7/65	10.0 cfs	Storage, maintenance and replenishment of reservoir for fish and wildlife propagation and recreation.
3) 98-2142	11/3/45	720 ac-ft	Propagation of migratory waterfowl and fish.
4) 98-2143	12/7/65	5,200 ac-ft	Storage for propagation of fish and wildlife and recreation.

APPENDIX B
DEVELOPMENT HISTORY

1942	Earth dam with wooden spillway constructed, which created 200-surface-acre reservoir. House and pump house present when site purchased.
Early 1950s	500 feet of channel around edge of lake excavated with explosives.
1964	Easement granted to the United States for 500KV overhead powerline administered by Bonneville Power Administration to cross eastern portion of the WMA from north to south.
1965	Earthfill dam rebuilt, creating 600-surface-acre reservoir.
1965 and 1967	Channels and dikes constructed.
1968	Easement granted to PGE for buried natural gas pipeline to cross northeast corner of the WMA.
1973	2,600 feet of channel excavated with dragline on north end of lake; several small islands constructed.
1975	Concrete boat ramp poured at access site; fishing docks installed.
1977	Storage-shop building constructed.
1981	New residence built; old residence sold and removed.
1987	25 islands and 1,800 feet of channel constructed.
1988	Reservoir partially drained to repair the retaining wall on the north side of the dam spillway.
1988	Handicapped-accessible toilet and new vault built to replace outdated facilities at access site.
1988-1989	Timber sale contract for 369,000 board feet let to create additional goose pasture, provide white-tailed deer forage areas, remove hazard trees from Highway 95 and Burlington Northern railroad tracks, and improve timber stand.
1994-1995	Reservoir drained to replace the retaining wall on the south side of the dam spillway, the drain pipe and the entire fish bypass.
1996	Easements traded with David Mendenhall to allow road access to Department property in the northeast corner of the WMA east of the BNRR and UPRR tracks.
1997	Easement granted to six property owners adjacent to the southwest corner of the WMA for a road right-of-way to resolve an unintentional trespass.