U.S. Fish and Wildlife Service

Necedah

National Wildlife Refuge

Furbearer Management Plan

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Cover photo: Gray wolves, Necedah National Wildlife Refuge, February 2014. Wolves are not trapped on the Refuge. They were Federally endangered until delisting on January 27, 2012, and then relisted December 19, 2014. Photo from camera trap, U.S. Fish and Wildlife Service.

Chapter 1: Introduction and Background

1.1 Context

This Furbearer Management Plan for the Necedah National Wildlife Refuge (NWR) is one of several step-down plans identified for completion in the Refuge's Comprehensive Conservation Plan (CCP) (USFWS 2004). Step-down plans provide programmatic and detailed management descriptions not developed in the CCP. The CCP and accompanying Environmental Assessment, available at http://www.fws.gov/midwest/planning/Necedah/ccp/FinalCCP.pdf, provides a detailed account of legislation establishing the Refuge; legal policy and framework; relationships with the State, partners, other agencies, and the public; Refuge environment; public use regulations; animal and plant species lists; management plan maps; and management features of the Refuge.

Pursuant to the Refuge's enabling legislation, the Refuge purpose is "a refuge and breeding ground for migratory birds and other wildlife…" (Executive Order 8065 [1939]) and "…for use as an inviolate sanctuary, or for any other purpose, for migratory birds" (Migratory Bird Conservation Act of 1929). Furbearer management is an integral component of this purpose and goals of the National Wildlife Refuge System:

1. Conserve a diversity of fish, wildlife, and plants and their habitats, including species that are endangered or threatened with becoming endangered.

2. Develop and maintain a network of habitats for migratory birds, anadromous and interjurisdictional fish, and marine mammal populations that is strategically distributed and carefully managed to meet important life history needs of these species across their ranges.

3. Conserve those ecosystems, plant communities, wetlands of national or international significance, and landscapes and seascapes that are unique, rare, declining, or underrepresented in existing protection efforts.

4. Provide and enhance opportunities to participate in compatible wildlife-dependent recreation (hunting, fishing, wildlife observation and photography, and environmental education and interpretation).

5. Foster understanding and instill appreciation of the diversity and interconnectedness of fish, wildlife, and plants and their habitats.

The vision for Necedah NWR exemplifies a diverse and productive ecological system of woodlands, savannas, and wetlands managed to perpetuate waterfowl and other migratory birds, listed species, and native biological diversity within Wisconsin's Central Sand Plain Natural Division. Refuge staff are a multi-disciplined team of biologists, technicians, and support staff who are dedicated to providing quality wildlife-dependent public use opportunities to a diverse and supportive public. The Refuge is a model in its commitment to create long-term mutually-

beneficial relationships with its stakeholders, and has produced consistent growth in the public's understanding and appreciation of the Refuge, the National Wildlife Refuge System, and Service trust resources.

The Refuge mission is to provide scientific and community leadership and support in the restoration, preservation, and management of waterfowl and other migratory birds, listed species, and native biological diversity within south-central Wisconsin, while providing, to the extent possible, quality wildlife-dependent recreational and educational experiences that foster an understanding and appreciation of these resources, and expands the role humankind plays in their stewardship.

1.2 Scope

This Furbearer Management Plan is a revision of the 1988 Refuge Trapping Plan, which included a Refuge Fur Management Plan as a subsection (USFWS 1988). At that time "fur management" referred specifically to trapping programs, including assessment of trapping desirability and relationship of trapping to other refuge objectives. "Furbearer management" has since been adopted as a term for the more inclusive goal of management of populations, including knowledge of size and distribution and management by methods in addition to trapping.

However, for practical purposes, trapping of furbearing animals, i.e., predatory mammals and aquatic rodents with pelts of commercial value, continues to be the primary emphasis of the plan. The taking of some species also falls under planning for Pest Management or Hunting (USFWS 2004). Taking of any furbearing animal on Necedah NWR is subject to the provisions of all State and Federal laws, including endangered species legislation.

The U.S. Fish and Wildlife Service (2012) recognizes the following 11 reasons for trapping mammals on refuges:

1. Predator control for threatened and endangered species protection.
2. Predator control for migratory bird protection.
3. Habitat management or protection.
4. Facilities protection.
5. Research.
6. Surveys or monitoring.
7. Public safety and health.
8. Feral animal control.
9. Population management.
10. Disease control.
11. Recreation/commerce/subsistence.

Current refuge actions significantly target only Objectives 3 and 4 (specifically beaver interference with water management) and Objective 11 (a public trapping program). Objective 1

deserves increased attention in light of poor reproduction, i.e., high chick mortality, of reintroduced whooping cranes.

The trapping program, evaluated annually, is primarily a public use program, largely recreational with a minor commercial component since harvested resources are sold. Especially during the past 15 or more years, depending on species, trapping during the State seasons largely removes surplus animals and is not a major population management tool. In addition, refuge staff or, upon request, private trappers have removed problem beaver that were clogging water control structures with debris or building dams which resulted in flooding of public roads or adjacent private land.

The refuge has conducted no recent surveys to measure furbearer numbers or assess effects of trapping on populations. Only a few studies, e.g., the Wisconsin DNR wolf survey (Wydeven et al. 2012) and a recent research project on bobcat distribution and abundance in central Wisconsin (Clare 2013) provided specific population estimates for some species that inhabit the refuge. Population status of other species is based on more general State surveys and less specific in area.

1.3 Policy

Compatibility determinations for trapping, along with public recreational activities of wildlife observation and photography, interpretation and environmental education, hunting, fishing, and berry picking as well as timber sales for forest management, were approved during the comprehensive conservation planning process for Necedah NWR in 2002 (USFWS 2004).

The Service permits the trapping of furbearing animals on national wildlife refuges where it may contribute to, or be compatible with, the management objectives of the refuge. Service trapping policy is based on the premise that, given habitat conditions capable of supporting healthy wildlife populations, harvestable surpluses are usually produced and constitute a renewable natural resource. Regulated consumptive harvesting has been shown to have no adverse effect, and may have beneficial effects, on the long-term stability and health of wildlife populations and their habitats. The Service recognizes trapping as an effective tool of wildlife population management and a legitimate recreational and economic activity.

The following Federal legislation authorizes or supports trapping on refuge lands:

The National Wildlife Refuge System Administration Act (1966) provides for trapping within statutory limitations and compatibility with the primary objectives for which the lands are administered. Trapping shall be conducted within the framework of applicable State laws, and requires possession of State license or permits.

The Refuge Recreation Act (1962) authorizes trapping as a method of surplus wildlife population control and disposal and provides for fees, permitting, and compliance with Federal and State permit provisions and regulations.

The Refuge Revenue Sharing Act (1935) provides for public or private economic use of the natural resources of any wildlife refuge area where the use may contribute to or is related to the administration of the area and provides for use by appropriate permit only when the authorized

activity will not be incompatible with the purposes for which the refuge was established.

The Fish and Wildlife Coordination Act (1936) authorizes federal agencies to cooperate and assist in protection and increase in supply of game and fur-bearing animals.

The National Wildlife Refuge System Improvement Act (1997) amended the National Wildlife Refuge System Administration Act and defined compatible types of public recreation to be permitted and promoted on National Wildlife Refuges. While hunting was identified as one of these recreational uses, trapping was not specifically mentioned. Trapping was only referred to (once) in the context of live trapping and transplantation as a method for use in scientific resource programs. However, the Act also mandated a Comprehensive Conservation Plan (CCP) for each refuge, which was completed for Necedah NWR in 2004. In the CCP, trapping was identified as an important management tool used to reduce or prevent damage to refuge roads, dikes, and water control structures and also to possibly reduce predation on nesting birds and provide a recreational opportunity. The CCP obviates a previous requirement for separate annual refuge trapping plans and identified step-down management plans to serve as implementation tools to describe specific strategies and implementation schedules for meeting CCP goals and objectives. Reference to furbearer management was the 1988 “Fur Management Plan” with then current status of “Review and Revise”.

Chapter 2: Consultation and Coordination

2.1 Trapping Regulations

Trapping, and the possession and disposition of furbearing animals, is permitted within the framework of applicable State license and permit regulations. The Necedah NWR trapping programs closely follows established State regulations with some exceptions, i.e., refuge trapping requirements may be more restrictive than State requirements for species not historically common or for specific refuge management reasons. In no case, however, are seasons, species, numbers authorized, or trapping procedures more liberal than State requirements without written concurrence from the State.

The State and other interested parties (e.g., conservation groups) were consulted during development of the original Refuge furbearer management plan (USFWS 1988) and in case of significant changes (e.g., closures). Changes may be required to: 1) promote the public safety, 2) prevent damage to lands or resources, 3) comply with management objectives, or 4) prevent overharvest of target or non-target species.

2.2 Cooperative or Exchange Agreement Lands

Trapping on all refuge land except the area north of Finley Road (Appendix E, Zone 7) requires a special refuge permit. As part of an administrative land exchange agreement with the State of Wisconsin in 1990, the Service, while retaining ownership, relinquished management of refuge land north of Finley Road to the Wisconsin Department of Natural Resources. Since that area is currently managed by the State, a refuge permit is not required to trap on that area. The State also does not require a special permit to trap on the Meadow Valley Area, which is Federal land

bounding Necedah NWR to the west and also managed by the State, other than the regular trapping license.

2.3 National Environmental Policy Act (NEPA) and Endangered Species Act (ESA) Compliance

NEPA

The 1988 Necedah NWR Trapping Plan contained an environmental assessment of that plan (Appendix A). The Environmental Assessment (EA) for Implementation of CCP for Necedah NWR (USFWS 2004) addressed hunting but did not specifically address trapping other than continuing prohibition of coyote trapping to avoid incidental take of endangered gray wolf. Likewise, the EA for the whooping crane reintroduction (Trick 2001) did not specifically address possible effects of the Necedah NWR trapping program on that species. The Furbearer Management Plan does not deviate significantly from the approved 1988 Trapping Plan, and minor changes have little or no additional anticipated environmental impact. Therefore, this plan complies with NEPA as a categorical exclusion (November 2015) as provided by 516 DM 8.5 and/or 43 CFR 46.210, and no further NEPA documentation will be made.

ESA Section 7 Consultation

All Service trapping programs shall be reviewed to ascertain if they may affect, adversely or beneficially, species listed in the Federal list of endangered and threatened species. In accordance with the procedures set forth in 7 RM 2.5, the Refuge Manager will conduct a Section 7 evaluation for any refuge trapping program which may affect such species or their habitats. Managers will also consider the impact of a trapping program on species considered threatened or endangered by the State in which the refuge occurs. Such impact should be addressed in the trapping plan.

The human disturbance associated with trapping could pose a threat to waterfowl and cranes by flushing birds off feeding and resting areas prior to beginning or continuing migration. Whooping cranes reintroduced on Necedah NWR are part of the experimental non-essential eastern migratory population and while on a National Wildlife Refuge are treated as federally Threatened status under authority of the ESA. Most refuge wetlands are occupied by territorial whooping cranes until or through November. For whooping cranes, trappers on foot in these territories might also contribute to habituation of the birds to humans and negatively affect future survival off refuge. The current policy of delaying trapping in these sensitive areas until after the gun deer season in late November alleviates many of these concerns. However, additional areas, specifically Pool 9 and the wetlands on the east side of the Pool 1 dike, should be considered for inclusion (refer to map of areas open to trapping in Appendix D).

Trapping could result in improved reproduction and survival of whooping cranes by reducing numbers of predators. Trapping could also, however, result in harm if whooping cranes are caught in traps because of improper type, placement, or period of operation. As mentioned, coyote trapping is prohibited on Necedah NWR. Even so, in fall 2013 a gray wolf was incidentally captured in a trap and then illegally killed and removed by the trapper, who had a legal license and permit to trap wolves (not federally listed in that season) off-refuge. Leg-hold

traps should be permitted only when and where they are inaccessible to wolves, cranes, and other non-target species. Possible impacts of trapping on endangered and threatened species were evaluated during Section 7 consultation (September 2015). Determinations of "no effect" on Karner blue butterfly (endangered) and northern long-eared bat (threatened) and of "may affect but not likely to adversely affect" whooping crane, gray wolf, and Blanding's turtle (State species of concern, proposed for Federal listing) obtained concurrence.

Other species of previous concern e.g., eagles and osprey, have been delisted. Concealment of any bait is required to prevent capture of these species. No other state-listed species are likely to be affected by the trapping program. The Blanding's turtle could be put at slightly greater risk because of increased vehicle traffic by trappers unaware of its presence.

Chapter 3: Refuge Environment

3.1 General Description and Wildlife Habitat

Necedah NWR consists of 43,696 acres in Juneau County, central Wisconsin. The refuge is approximately 180 miles southeast of the Twin Cities, Minnesota, 150 miles northwest of Milwaukee, Wisconsin, and 4 miles west of the village of Necedah. The Refuge is located within an area known as the Great Central Wisconsin Swamp, which was the largest swamp in the state (7,800 square miles) before drainage that followed European settlement.

Runoff flows through the refuge in a northwest to southeasterly direction with the discharges from incoming tributaries and local drainage being collected by the Little Yellow River at the southern refuge boundary. Flows from this tributary are then conveyed into the Yellow River just south of the village of Necedah and ultimately into the Wisconsin River. The topography is relatively flat, a natural fall of 50 feet in 13 miles occurs from north to south across the refuge. The refuge contains approximately 11,200 acres of wetlands, including 6,400 acres of sedge meadows, 4,700 acres of marsh and shrub swamp, and 120 miles of ditches or channelized streams. In addition, approximately 28,600 acres are terrestrial habitat, including 50 acres of cropland, 6,400 acres of grasslands, 21,600 acres of oak-jack pine forest and brush lands, and 550 acres of building sites, roads, and parking areas.

Since designation as a wildlife refuge in 1939, marsh restoration programs have been implemented. Water control structures and vegetation planting created pools used as feeding areas for waterfowl.

Private lands are adjacent to the refuge on the south and east. Public lands, about 50,000 acres, of the Meadow Valley Wildlife Area are adjacent to the west boundary of the refuge. Approximately 70% of the land for 20 miles in all directions surrounding the refuge is wooded habitat and appears much the same as that occurring on the refuge. Therefore, the refuge habitat generally is not a unique island habitat amidst an agricultural community. Waterfowl use refuge marshes for resting, roosting, and feeding. Canada geese and sandhill cranes do fly out of the refuge to feed on the few existing privately owned croplands nearby.

Surface soil is sandy in uplands and muck and sand in the lowlands. An impervious subsoil layer

of clay exists 4-6 feet below the surface and maintains the water table at or near the surface at moist locations.

Approximately one-half of the refuge is forested with Hill's oak and jack pine. Emergent vegetation in the 11,200 acres of wetland include sedges, woolgrass, willow, and spikerush. Cattail is not abundant. Typical submerged aquatics are elodea, *Najas*, pondweeds (*Potomegeton* spp.), wild celery, bladderwort, and Eurasian watermilfoil; moist soil annuals include several species of smartweed, two species of wild millet, rice cutgrass, and beggar-ticks.

In 1965 a prairie restoration program was begun to improve the nesting habitat for waterfowl and marsh and shorebirds. Since that time 10,000 acres adjacent to the larger impoundments have been cleared. Waterfowl have stopped at the refuge in large numbers during fall migration.

More than 230 species of birds use Necedah during some part of the year. Hunting for white-tailed deer, trapping, and berry picking are the principle consumptive uses. Forestry programs are active, emphasizing creation of open landscapes. Prescribed burning is used in an attempt to maintain prairie and oak savanna restoration areas. Water level manipulation is used to encourage growth and wildlife utilization of moist soil and aquatic plants and provide habitat for aquatic and marshland birds.

3.2 Wildlife and Public Interest

The visitor count on Necedah was 168,538 in 2012. Wildlife observation was the most frequent form of public use.

Terrestrial Wildlife: The refuge bird list shows 231 species, many of which are associated with aquatic areas. In addition, the refuge supports many mammals, including a large population of white-tailed deer. Other game mammals include gray squirrels and furbearers (see below). Wild turkeys were successfully reintroduced in Wisconsin and are common on the refuge. Ruffed grouse and woodcock are other common upland game birds.

Aquatic Wildlife: Among aquatic mammals, muskrat, mink, beaver, and otter are found on the refuge. Many marsh and shorebirds are found in the aquatic portions of the refuge, including great blue herons, green herons, common egrets, bitterns, rails, pied-billed grebes, and black terns. During migration, many shorebirds use the area. Wilson's snipe are common. Waterfowl are common nesters and migrants, with mallards, blue-winged teal, and wood ducks the most common nesting species. During migration more than 15 species are commonly found. Puddle ducks are more abundant than divers because there is limited habitat for divers. Canada geese are a common nesting species, and as many as 30,000 have been counted during the fall. Trumpeter swans have been successfully reintroduced and are also common. Whooping cranes have also been reintroduced but the population is not yet self-sustaining.

Sandhill cranes are both nesting and migrants. An estimated 15-20 are produced on the refuge each year, and peak numbers during migration are more than 1,000. The refuge and surrounding area is one on the primary sandhill crane staging areas in Wisconsin. Tundra swans migrate

through the area, but not in large numbers. Coots do not commonly nest on the Refuge but pass through in fair numbers during migration.

Significant Mammalian Species: Common mammals on the refuge are white-tailed deer, muskrat, red and gray squirrels, beaver, coyote, red fox, raccoon, mink, badger, and otter. Small numbers of gray wolf and bobcat are present. Gray fox, weasels, opossum, and striped skunk are present, but their abundances are unknown. Cottontail rabbit, snowshoe hare, and fox squirrel were historically reported but currently are largely absent.

Fish, Reptiles, and Amphibians: Fish of the deeper water areas include northern pike, bullheads, bluegill, pumpkinseed, black crappie, golden shiner, largemouth bass, and yellow perch. Mudminnows and brook sticklebacks inhabit marshes and shallow waters.

Some of the more common reptile and amphibian species that occur on the refuge are the snapping turtle, painted turtle, Blanding's turtle (State threatened), garter snake, hognose snake, chorus frog, spring peeper, green frog, leopard frog, and spotted salamander.

State and Federally Endangered Species. Other than the Karner blue butterfly, whooping crane, and gray wolf, the presence of federally endangered species on the refuge is rare. The refuge contains no habitat that is critical to the existence of a currently listed endangered species.

Chapter 4: Status of Furbearer Populations

4.1 Assessment of Trapping Desirability or Acceptability

The Fish and Wildlife Service's Wildlife Refuge Manual states that the Service will permit the trapping of furbearers on units of the National Wildlife Refuge System where it contributes to, or is compatible with, the management objectives of the refuge. Justification for trapping within the National Wildlife Refuge System is also stated in the Refuge Programmatic Environmental Impact Statement. Current refuge policy is to allow trapping of historically common species according to State regulations.

The following factors were considered in determining whether furbearing animals should be removed from refuge lands:

1. Total numbers of fur animal species listed are generally in excess of the breeding stock required to maintain a population consistent with refuge objectives, i.e., generally a harvestable surplus is available.

2. Population controls of some species of furbearers may be necessary or desirable in exercising certain biological controls. For instance, muskrat and beaver populations should be managed at levels compatible with refuge habitat and with refuge objectives which may involve

habitat manipulations. This includes a muskrat population sufficiently high enough to maintain openings in emergent vegetation for waterfowl nesting, feeding, and loafing activities, but not so high as to destroy vegetative interspersion or damage water control facilities.

3. Removal of some species, especially beaver, is necessary in certain trouble spots in order to prevent damage to habitat, public roads, dikes, and private property adjacent to the refuge. Beaver activity in road culverts, water control structures, and ditches draining adjacent to private lands has been a continual historic problem on Necedah NWR due to high beaver numbers.

4. Previous Necedah NWR predation research (dummy nest studies) have proven that common predators such as mink, raccoon, skunk, and opossum had a significant adverse effect in limiting the success of the refuge objectives in waterfowl production.

5. Furbearers with high population densities are known to have the potential of transmitting contagious diseases among themselves as well as other wildlife species, domestic animals, and man. For instance, tularemia has been known to affect refuge beaver and muskrat populations and has the potential to infect all of the other animal groups mentioned above, including humans. Distemper in raccoon and mange in fox and coyote could also be cited as examples.

6. The enforcement of special refuge trapping regulations is an important consideration in minimizing any detrimental effects on the future of any species on the refuge, especially the non-target species.

7. Consideration is also given to whether or not there is sufficient public interest in trapping on the refuge. Public interest generally fluctuates with fur prices. However, a few individuals do enjoy recreational trapping as long as their proceeds from fur sales approach the level which covers their expenses. For instance, at times beaver fur prices have been so low that there was little or no interest in trapping beaver. This may result in the refuge contracting for the necessary removal of problem beaver at specific sites. Sometimes refuge personnel have been required to effect the removal. Authorized individuals who trap on the refuge should be assured a quality wildlife-oriented experience while utilizing a renewable resource that could otherwise become a burden to the overall management of the refuge. A quality experience contributes to public interest in doing a necessary job which would otherwise be expensive for refuge personnel to perform.

The assessment of items (1) through (7) should be supported by knowledge of species biology, research findings and/or population observations, and knowledge of existing conditions. If there is no public interest, and furbearer removal is desirable, harvest by staff or contract may be employed. Conversely, public harvest, without specified management need, may be permitted provided it is compatible with refuge objectives and management goals such as assessed above.

4.2 Species Accounts

Historically, Necedah NWR has permitted trapping of mink, muskrat, beaver, raccoon, opossum, skunk, and the three resident weasel species. Otter trapping was permitted beginning in FY2011 (fall 2010; FY = federal fiscal year, e.g., FY2011 = October 2010 – September 2011). The reported fur harvest for the most abundant and commonly trapped species (mink, muskrat, beaver, and raccoon) has been recorded from FY1950 to the present (Figs. 1 and 2; Appendix I). No refuge-specific population surveys are available. Annual fur trapper surveys are conducted by the Wisconsin DNR (see below). Trap returns provide a crude index of long-term population trends, but are greatly affected by factors such as proficiency and commitment of individual trappers and variable trapping effort (Appendix J, Fig. 1a), and statewide are often related to annual fur prices. Overall, data from several sources are available (see also Winter Track Survey below), but they are not necessarily in agreement, and none directly measure population size. Within these limitations, the known status of various refuge species is described below. Refuge furbearer harvest appears in Appendix I. The statewide trends refer to the 23-year period from FY1992 to FY2014 (Appendix J, Figs. 1a and 1c). All species trapped on the refuge are common with no apparent risk of long-term population decline due to trapping.

Mink. — Numbers trapped on the refuge were highly variable through FY1985, with peak of 77 in 1982. Numbers were more stable from FY1986 to 2015 with mean = 8.6 animals trapped (Fig. 1). Statewide, numbers were variable with generally lower numbers since 2009 (Appendix J, Fig. 1b).

Muskrat. — Numbers trapped were highly variable from year to year, with peaks occurring in the mid-1980s, the highest in FY1981 with 2,332 animals trapped. Numbers have been more stable since 1994 (mean = 287 animals trapped per year). Numbers of mink and muskrat may partially reflect a predator-prey relationship (Fig. 1). Muskrats are one of the most frequently sought and trapped species in Wisconsin (46.2% of trappers, Dhuey and Olson 2014a). Statewide, numbers were highly variable from year to year with no clear trend (Appendix J, Fig. 1b).

Beaver. — Numbers trapped were highly variable through FY1996 with peak of 139 in FY1990 (Fig. 2). Numbers were relatively more stable since FY1998 (mean = 32 trapped per year). Statewide data were variable and showed no clear trends except for a recent decline in numbers after peaks in FY2001-06 (Appendix J, Fig. 1b). A helicopter survey of the northern third of Wisconsin (20,016 square miles) in October 2011 yielded an estimated 54,700 animals, an increase of 21% since 2008 but 42% lower than in 1995 (Rolley et al. 2011). No surveys were conducted in central Wisconsin.

Raccoon. — This species is abundant in a wide range of habitats in central Wisconsin. Numbers trapped on the refuge peaked during the 1970s with highest number of 386 animals in FY1974 (Fig. 2). Since FY1978, a mean of 72 animals have been trapped per year. Raccoons are the most

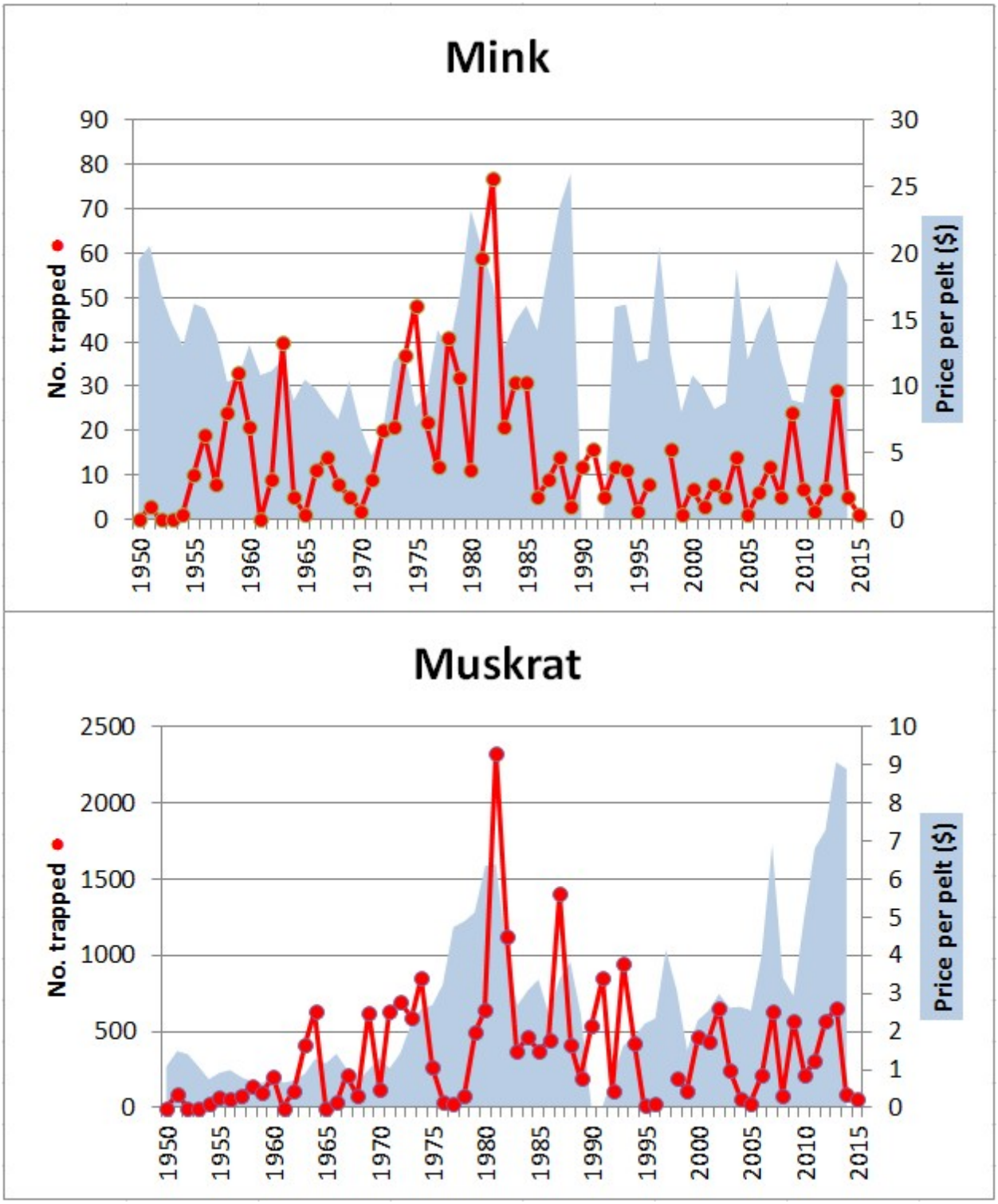

Figure 1. Reported mink and muskrat harvest from trapping on Necedah National Wildlife Refuge and average fur prices (shaded, gaps = no data), FY1950-2015. See also Appendix 1.18.8.

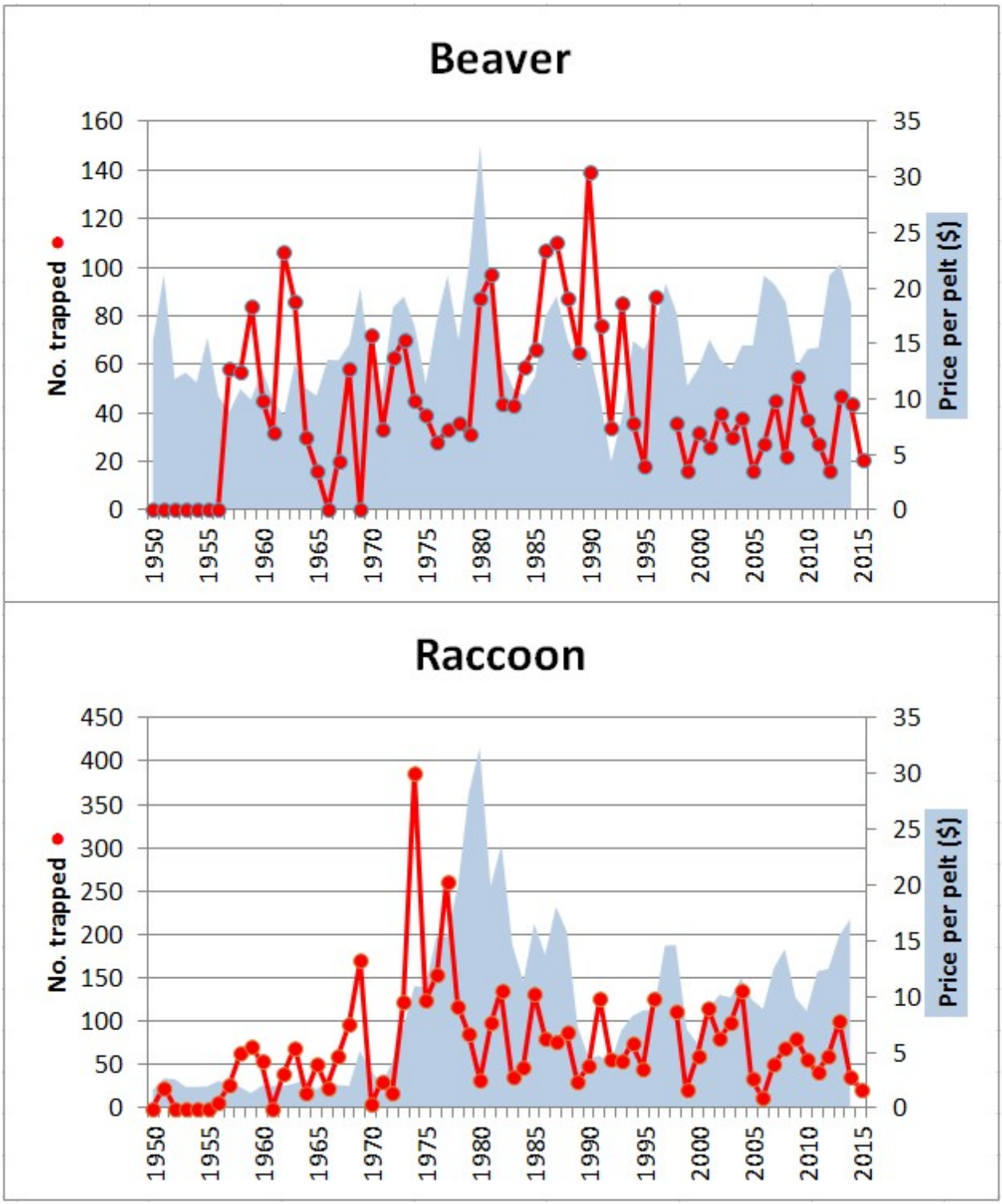

Figure 2. Reported beaver and raccoon harvest from trapping on Necedah National Wildlife Refuge and average fur prices (shaded, gaps = no data), FY1950-2015. See also Appendix 1.18.8.

frequently sought and trapped species in Wisconsin (65.7% of trappers, Dhuey and Olson 2014a). Statewide data were variable and showed no clear trends (Appendix J, Fig. 1b).

Otter. — Trapping of otter was first permitted on the refuge in FY2011 when 4 animals were trapped; 1, 3, 1, and 0 otter were trapped during the four succeeding winters. In addition, 2 and 1 otter were incidentally trapped in 2004 and 2010, respectively. Statewide, otter are common and showed a slight peak in the late 1990s and early 2000s followed by a slight decline (Appendix J, Fig. 1b). All harvested otter must be registered with the DNR. An aerial survey, conducted annually since 2004, indicated that the population declined approximately 35% from about 14,000 animals in 1994 to 8,600 in fall 2007. The fall 2014 population estimate was approximately 10,700 (Rolley et al. 2014a).

Bobcat. — Bobcats are not currently trapped on the refuge. A recent population study estimated 250-490 animals in a roughly 19,305-square mile area of central Wisconsin, including Necedah NWR (Clare 1983). All harvests must be registered. Statewide and based on harvest data, the population has shown an upward trend since the late 1990s (Appendix J, Fig. 1b). However, a population model incorporating age, reproduction, and winter track survey data indicated that the fall population size in northern Wisconsin increased from about 1,600 to about 4,100 during the 1990s and early 2000s, stabilized during the mid-2000s, and declined to about 2,200 in recent years (Rolley et al. 2014b). The only DNR survey including Necedah is the winter track survey (Dhuey 2014b) (Appendix K).

Coyote. — Coyote are not currently trapped on the refuge. Historically, trapping has not been permitted because of possibility of capturing gray wolves, formerly and currently endangered (see below) and also not trapped on the refuge during the 3-winter period while delisted. Statewide, coyote trapping returns have shown an upward trend during the past decade (Appendix J, Fig. 1c).

Fisher. — Fisher trapping is not currently permitted on the refuge, although single animals were reported as incidental captures in FYs 2004, 2005, and 2008, respectively. Statewide, trapping returns were variable but indicated an upward trend until 2007, after which numbers declined (Appendix J, Fig. 1c). All harvests must be registered. Although the statewide population has grown during the past few decades, recent model analyses indicate that the population size may have been overestimated. Adjusted models produced and estimated 6,700 fishers in fall 2014 in the northern one third of the state; no estimates are available for central (including Necedah NWR) and southern Wisconsin (Rolley et al. 2014c).

Gray Wolf. — The state population in FY2012 winter was 815-880 in 213 packs plus at least 20 loners. The population rapidly increased from the late 1990s to the present and continues to increase at a slow rate. Necedah NWR is in DNR Management Zone 2, which is the smallest of the four wolf management zones and includes northern and central Adams and Juneau, southern Wood, northeastern Monroe, eastern Jackson, southern and western Clark, eastern Eau Claire,

and southeastern Chippewa Counties. In 2012, this zone contained 32 packs, 119-135 animals, and average pack territory size was 34 square miles.

The Wisconsin population was federally delisted on 27 January 2012. Gray wolves have been state delisted since 2004 and were designated as a game species on 2 April 2012 (Wydeven et al. 2012). Trapping of wolves has not been permitted on Necedah NWR, even while delisted. A total of 117 wolves were harvested statewide during the FY2013 season, filling all zone quotas. Trappers harvested 62 wolves and hunters harvested 55 (Wisconsin DNR 2013); 23 wolves were taken in DNR Harvest Zone 5, which roughly corresponds to Management Zone 2 and contains Necedah NWR. During the FY2014 season, 257 wolves were harvested. Trapping accounted for 180 wolves and hunting accounted for 77. All zones again closed early as quotas were filled; 35 wolves were taken in Harvest Zone 5. During the FY2015 the season again closed early (December 4) as the 150-wolf state quota was reached (154 wolves harvested as of December 5). A federal court decision relisted the species as endangered effective December 19, 2014.

Other Species. — Small numbers of opossum, skunk, and weasels have been trapped on the refuge. Statewide, opossum trapping returns were relatively stable except for a peak in the early to mid-2000s (Appendix J, Fig. 1c). Skunk showed no long-term trends (Appendix J, Fig. 1c). Fox trapping has not been permitted on the refuge. Statewide, red fox declined until stabilizing at lower levels in the mid-1990s (Appendix J, Fig. 1c). Except for an unusual spike in FY2012, gray fox harvest has been stable during the past two decades (Appendix J, Fig. 1c).

Winter Track Survey. — In addition to results above, the Wisconsin DNR conducts an annual winter track survey which tallies number of tracks per transect. However, this survey is heavily affected by snow conditions and is targeted to northern Wisconsin, where it is most effective. Necedah NWR is in the southernmost portion of the southern zone, for which much less data are available, and variability confounds interpretability (Appendix K). Statewide, results from 1977-78 to the present indicate possible long-term increasing populations of bobcat, fisher, fox, and gray wolf, and highly variable but long-term stable populations of coyote and otter (Dhuey 2014b).

4.3 Inventory and Monitoring of Refuge Furbearer Populations

The 1988 Refuge trapping plan indicated that Refuge furbearer populations were to be monitored by frequency of observations and annual harvest, and harvest targets should be 80% of fall populations of muskrats and 60% of other furbearers. However, how fall populations could be estimated from this information was not described. The actual cost of determining and monitoring size of furbearer populations on the Refuge would be high and need to be weighed against the potential management benefits.

Beavers cause significant water management problems by plugging water control structures and occasionally flooding public roads. However, these issues can usually be approached most efficiently on a case-by-case basis without in-depth knowledge of population parameters that

would only be attainable by intensive study. Likewise, muskrats frequently cause significant, although variable, damage by burrowing into and undermining dikes. These incidents can also be repaired on a case-by-case basis without extensive knowledge of population parameters. Muskrats on Necedah NWR are not overpopulated and have not been responsible for any significant recorded adverse effects on marsh vegetation in recent decades. The 1988 trapping plan indicated that higher percentages of muskrats should be harvested in pools where fall or winter draw-downs were planned because overwinter mortality would be high in those conditions. However, muskrat populations on the Refuge may have decreased since that time because of the increased frequency of maintaining pools at these low winter water levels. Determining numbers of muskrat by fall counting of houses is a standard technique to obtain population indices elsewhere, but this technique is not currently reliable on Necedah NWR because many refuge muskrats use bank dens.

Predator reduction has historically been a management practice used to increase waterfowl production on National Wildlife Refuges, although data to evaluate effectiveness on Necedah NWR are unavailable; therefore no analysis of costs and benefits is possible. Beginning in 2001, Necedah NWR became the primary site in Wisconsin for reintroduction of the endangered whooping crane. About 60% of adult whooping crane mortalities are due to predation (Urbanek et al. 2014). Of greater importance to the welfare of this population is mortality of unfledged chicks. Chick survival has so far been very low, and raccoon and mink are common potential predators in the whooping crane territories. Study of relationships among these species will be necessary to provide information needed for successful establishment and management of the whooping crane population.

Although measurement of population size is not feasible for most furbearer species, some effort to collect baseline data on distribution and abundance of predatory furbearers on the refuge is warranted. This objective will be included in the Refuge Inventory and Monitoring Plan anticipated to be completed in 2016. A main goal is to determine feasibility of a monitoring program based on a method which produces greatest amount of information with least effort. Camera surveillance along linear landscape features similar to the methodology used by Clare (2013) and Anderson (University of Wisconsin-Stevens Point, personal communication) might contribute toward this goal. A recent study using Reconyx HyperFire cameras already in the refuge inventory and available during fall/winter 2013-14 indicated potentially effective monitoring capability only for wolves during that time period (Urbanek 2014). However, additional trials during other seasons are recommended.

4.4 Predator and Nuisance Animal Control

Certain circumstances such as sensitivity of the area(s) to be trapped, limited trapping needs, or lack of public interest, may necessitate a Service or contract trapping operation. Trapping may be accomplished by refuge staff, APHIS personnel (e.g., USDA Animal Damage Control), or by one or more trappers hired or contracted for that purpose. Such removal might be more appropriately considered under Refuge authorities for Pest Control.

To avoid potential conflicts of interest, Service personnel may trap only when necessary for management and/or educational or research purposes as part of their official duties. All furs thus trapped are property of the U. S. Government. They may be retained for educational or research purposes, disposed of in accordance with 7 RM 15.12B(2)(d), buried, or placed as food for predators.

Whooping Crane Mortality

Reintroduction of an experimental non-essential population of federally endangered whooping cranes began on Necedah NWR in 2001. Although the main source of adult mortality is predation (Urbanek et al. 2014), loss of adults to predators is not high enough to constitute a critical threat to establishment of the population. However, mortality of chicks before fledging is a primary cause of the current inability of reintroduced eastern migratory whooping cranes to achieve reproduction necessary to maintain a self-sustaining population. Based on circumstances of chick disappearance and on studies of sandhill cranes elsewhere, predators are like*ly a major contributing factor. Because crane chicks must survive 10-12 weeks before they are capable of flight, high mortality due to predators during this period is a common limiting factor for crane populations in general. If the problem of nest desertion, the primary cause of reproductive failure (Urbanek et al. 2010), is not solved, then solving the chick mortality problem is largely moot. However, if the former problem can be solved, the latter problem may still require resolution in order for the population to become self-sustaining.

The current largely recreational trapping of furbearers during the open fall/winter season is not likely to reduce predator populations to levels that will significantly reduce predation. A spring predator removal program similar to those successfully conducted for breeding waterfowl (Pearse and Ratti 2004) might be needed if habitat management (e.g., water control, reduction of vegetation used as predator cover) are insufficient. Predator removal is standard practice on Mississippi Sandhill Crane NWR (U.S. Fish and Wildlife Service 2007), where most efficient and cost-effective control has been accomplished by contracting professional trappers (Hereford 2014).

Problem Beaver

There has been need to control beaver which plug water control structures with debris or build dams which result in flooding of public roads or adjacent private land. Removing debris or dismantling dams is routinely performed by refuge personnel. Private trappers under a refuge trapping permit remove beaver during the regular open beaver trapping season, and beaver trapping in some units (Appendix D) is currently required. Contracted trappers are used to remove problem beaver when the regular State beaver trapping season is closed.

Formerly, the refuge used the state "Contract for Beaver Removal" form in contracting with private trappers to remove beaver per authorization under the State Beaver Removal Permit during the closed season. Currently, the refuge authorizes beaver removal by Special Use Permit (SUP) (Form 3-1383-G) and operates under state regulations allowing removal of nuisance animals.

Contracts for beaver removal are generally used to remove only problem beaver within a 0.5-mile distance of a specific trouble site. These contracts are issued to willing refuge trapping permittees who have the beaver trouble sites within their trapping permit zone.

The contracts may be issued in the fall prior to the opening of the regular beaver trapping season when the value of the pelt is usually enough to cover the trapper's expenses and also while the trapper is already in the vicinity trapping other legal furbearers at the time. If the trapping permittee chooses to delay taking the problem beaver until the fur becomes prime, then the trapper must agree in the meantime to maintain the function of the water control facility which the beaver is obstructing. In this case, the refuge does not pay the trapper to remove the beaver.

Many beaver problems occur in the spring after the close of the regular trapping season. Again, any willing trapper may be contracted to remove problem beaver, usually without payment, as late as the end of April. The pelts are still prime and their value has been enough to cover the trapper's expenses.

After the first of May and through the summer and early fall, beaver pelts have little or no value. Under these circumstances, the contractor has been paid from $10 to $30 per beaver removed. The latter figure, $30, has been the negotiated price to remove adult beaver, while $15 has been paid to remove each juvenile or kit. However, no summertime beaver removal contract for money is issued to the same person who trapped the beaver problem area during the previous regular trapping season. Thus, a trapper permittee is less likely to leave beaver during the regular trapping season in order to further profit during the off-season.

Chapter 5: Public Trapping Program

5.1 Permitting

The Refuge trapping program consists of permitted trappers on assigned units. Application materials appear in Appendices B-G. Trappers are required to report catch each week (Appendix H) and comply with State trapping regulations (Wisconsin DNR 2014a, Appendix L) as well as Refuge general Special Use Permit (Form 3-1383-G) and special conditions (Appendix G). Currently, a $35.00 fee is charged each permittee. This minimal fixed fee system is used because the economic return to the trapper is usually minimal, but the fee should be sufficient to cover government cost of administering the program.

5.2 Species to be Taken

Species to be taken are common furbearers which can be legally trapped under state law in the vicinity of the refuge and include mink, beaver, skunk, raccoon, weasel, muskrat, and opossum.
Trapping of fox and coyote continues not to be permitted on Necedah NWR. The increasing coyote population has largely replaced formerly more abundant foxes. Trapping of gray wolf, formerly endangered, is also not permitted. If the wolf is delisted and remains so long-term, trapping of wolf and coyote might be considered in the future. Trapping of otter was permitted beginning in 2010 (FY2011) so that trapping on the Refuge would be more consistent with State regulations. The same might be considered for fisher and bobcat, not currently trapped on the

Refuge, at some future date. Both species are now common in central Wisconsin, and some fisher have been incidentally captured on the Refuge. Permitting trapping on these species may be considered in the future. Badger are common but cannot be legally trapped in Wisconsin.

5.3 Trapping Techniques and Special Conditions

Refuge trapping programs will be conducted in the most professional manner possible. Trapping techniques should be selective, humane, and effective as is reasonably practical, considering the target species and habitat conditions of the refuge. The types, sizes, sets, baits, scents, and locations of traps will be selected to minimize the taking of non-target species. Certain trap types or uses may be restricted and others encouraged when more effective and humane trap types and trapping techniques are developed. Permit provisions will encourage the use of quick-kill or drowning sets for authorized species when feasible. The State required daily inspections of all dry-land sets may be waived only under extreme or unusual circumstances such as conditions hazardous to life or safety. The general trapping conditions include several trapping restrictions or requirements intended to reduce the taking of non-target species. Additional more restrictive special conditions may be required by the Refuge Manager based on guidelines of the State wildlife agency or trapper association and on the habitat conditions and species to be taken on the refuge. In no case will general trapping conditions be more liberal than State regulations.

As indicated in the general trapping conditions, specific refuge trapping regulations will stipulate the following, as appropriate:

1. Species and numbers to be taken.

2. Seasons and hours.

3. Areas where trapping is permitted or prohibited.

4. Methods of trapping, i.e., types and sizes of traps, trap sets, baits and scents, and locations which are permitted or prohibited.

5. Methods of dispatching animals found alive in traps.

6. Methods of carcass disposal. (Animal carcasses may or may not be marketable.) In any case, they are usually disposed of by the trapper.

7. Procedures for submission of reports of target and non-target species and animals suspected to be diseased.

8. Provisions governing the use of refuge vegetation.

9. Provisions governing trap and equipment removal.

10. Other provisions as specified.

The Refuge Manager will provide for patrol and spot checking of the entire trapping

operation to assure compliance with permit provisions.

5.4 Permittee Selection System

Announcement of Annual Trapping Program: There must be adequate publicity to announce the trapping program and deadline dates through newspapers, notices in public places, personal contacts, and other appropriate methods. A 30-day public notice should be provided when possible.

Announcements shall contain relevant information including: who may apply, species authorized, dates of trapping season, any minimum equipment required, where application forms may be obtained, date by which applications must be received, means of permittee selection and notification of selection, and any special requirements, such as fee information, deemed necessary by the Refuge Manager.

Application: All interested parties shall be provided with the Application for Refuge Fur Trapping Permit (Appendix F), and any additional instructions for completing this form which the Refuge Manager deems necessary. A copy of all trapping conditions (general and specific) will also be provided. Applications shall become a part of the refuge's official records. Appropriate deadlines will be established for receipt of applications. In cases where selection is open to the public, the time, place, and date of selection should be provided with each application. Such public selection is encouraged.

Applications contain personal information covered by the Privacy Act (5 U.S.C. 552a). Use of the application is restricted to Service personnel as stipulated in the Privacy Act Statement contained on the application form. Except for routine uses, a copy of the application or information contained therein may be given to another party only upon written permission of the applicant.

Selection of Permittee--Qualification Factors:

1. Discretionary. The Refuge Manager shall consider a number of factors in deciding whether an applicant qualifies for a trapping permit. These factors are for the manager’s consideration only and are not binding or mandatory. A manager may or may not disqualify an individual on the basis of one factor alone; whether a decision is based on one or several factors, he/she should be able to support it. Qualifying factors are as follows:

   a. Experience. Whether the applicant has at least two seasons of trapping experience for the target species with the trap system (trap types and sets) required on the refuge.

   b. Equipment. Whether the applicant will have the necessary number and kinds of traps and other equipment specified in the special trapping conditions or otherwise determined by the Refuge Manager as adequate to achieve desired population reduction.

   c. Training. Whether the applicant has participated in any trapper orientation or training program (Federal, State, or private) or is willing to attend such a program if offered. (Trapper education programs are conducted in Wisconsin and the Service strongly encourages such

programs.)

d. Other Factors. Whether the applicant meets other criteria deemed necessary by the Refuge Manager in order to achieve the desired control of problem species. In other words, the Refuge Manager may select a trapper who will trap specific problem beaver over a trapping applicant who has indicated or has shown he will not trap beaver when beaver fur prices are low.

2. Non-discretionary.

a. State License or Permit. Each selected applicant must possess a State trapping license or permit prior to issuance of a refuge trapping permit. (A permit applicant need not possess a license at the time of application, but should at least acknowledge intent to obtain a State license if selected as a permittee.)

b. Age Consideration. Except as specified below, the select applicant must have attained the legal age to enter into a contract in the State in which trapping is to be done. (50 CFR 31.16 requires that "… persons trapping animals on wildlife refuge areas ... shall secure and comply with the provisions of a Federal permit issued for that purpose." The permittee, by his/her signature on the permit, agrees to various permit trapping conditions. In order for the permit to be a legal document, the permittee must be the legal age to enter into a contract in the State in which the permit is effective.)

c. Provision for Novice Youth. If a young person under the required age wishes to trap, and has the concurrence of his/her parent or guardian, he/she may accompany a permitted trapper as an assistant or apprentice. The Refuge Manager should specify any limit on the number of assistants a permitted trapper may have. Novice youths may trap only in the company of the permittee. Assistants trapping alone must possess a copy of the issued permit. In all cases of youth apprenticeship, the Refuge Manager must receive a written authorization of the youth's parent or guardian, either on the permit itself, or as a separate document.

d. Provision for Qualified Youths. If the Refuge Manager considers a youth trapper to be both qualified and responsible, he/she has the discretion of issuing a permit to the youth, provided the youth's parent or guardian .co-signs the permit, thus making it a legal document.

Beginning in FY2012, the refuge started a youth mentoring program which preferentially awarded trapping privileges to applicants who mentored one or more young trappers. One trapper from this group was the first among all applicants selected for choice of a trapping unit. This selection did not preclude other trappers who were mentoring youth from receiving permits. The youth mentoring program will be evaluated and reconsidered for continuance or modification as needed.

Selection of Permittee--Technical Considerations: A lottery will be used for permittee selection if there are more qualified trappers desiring to trap than the refuge can support, and/or if there is a need to choose between trappers desiring to trap the same area.

Trappers are required to list on their application their choice of refuge trapping units in order of their preference. As each successful applicant is drawn, he/she will be assigned to the trapping unit of his highest available preference.

All applicants may attend the drawing if they wish, although it is not necessary. Successful applicants will be notified by mail immediately after the drawing. Successful applicants will be allowed to exchange trapping units if the refuge is notified by both parties concerned prior to the issuance of the permits.

If there are inadequate numbers of applicants qualified to handle the refuge areas to be trapped, other means, such as employment of qualified trappers or expansion of each trapper's area, may be considered.

Applicants will be notified as to their qualification status and selection. Applicants will be notified in writing of permit denial and the reasons for denial. Applicants not selected, or determined not qualified, who wish to appeal the decision should follow the appeals procedures designated in Title 50 CFR 25.44 (see 6 RM 17, Permits and Agreement). Several standby permittees may be selected in addition to the regular permittee at the discretion of the Refuge Manager. Units may be traded for the convenience of the permittees affected if mutually agreeable and the Refuge Manager approves.

A selected trapper may have one or more assistants. An assistant may not trap alone but must accompany the permitted trapper unless otherwise authorized by the Refuge Manager.

Trapping with one or more partners may also be permitted at the discretion of the Refuge Manager. If partnerships are permitted, each partner must apply and qualify, and each is equally responsible for all fees and subject to all trapping provisions. Each partner must sign the trapping permit, and each will receive a copy of the permit.

Permits and Permit Revocation: The Refuge Manager will issue a Refuge Special Use Permit (Form 3-1383-G) with supplemental conditions (Appendix G) to each trapper selected.

Permits will apply to a specified period of time and are usually issued for no more than one trapping season only.

All general and specific conditions will be provided separately to each permittee, partner, or assistant, and all conditions are considered a part of the permit.

After signing by the permittee and the Refuge Manager, the original permit is returned to the permittee. Each trapping partner will also receive an originally signed copy of the permit. One copy of the permit will be retained in the refuge files.

A permit may be revoked by the issuing officer for just cause as specified in 50 CFR 25.43. Permit suspension may be immediate. However, upon revocation, the permittee shall be notified of the appeals procedures set forth in 50 CFR 25.44. A copy of any notice of revocation or suspension will be provided to the regional office, and a copy retained in the refuge files attached to the permit.

Failure to comply with any conditions of the trapping permit is not only cause for revocation of the permit but is cause for refusal of future permits to trap or for refusal of any other use or privilege on the refuge for which a permit may be required.

It should be noted that any violation by any trapper (youth or adult) may result in immediate revocation of his/her permit or apprenticeship and suspension of all trapping privileges.

5.5 Annual Trapping Program

Refuge staff reevaluate the Refuge trapping program annually to optimize conservation of wildlife resources and protect refuge water management capabilities while providing recreational opportunity to the public. A formal annual trapping plan required before completion of the Refuge CCP has been replaced by this step-down plan and modifications as needed to the annual trapper application packet (Appendices B-H). Recent modifications have included:

1. Permitting trapping of otter.
2. Adding the youth mentoring program.
3. Mandating beaver trapping by participants in some units.
4. Increasing number of participants by subdividing original units to create more units.
5. Revising forms.

Requests by trappers for additional modifications are also considered.

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APPENDICES

Appendix A. Environmental assessment of 1988 Refuge trapping plan (USFWS 1988).

Effects of the Proposed Action

Beneficial Effects

1. Maintain optimum muskrat population in order to create openings for waterfowl in dense stands of emergent vegetation, but prevent overcrowding and destruction of vegetative interspersion required for waterfowl.

2. Minimize furbearer damage to physical facilities.

3. Minimize undesirable competition or interaction among wildlife species.

4. Control high population densities which have the potential to transmit contagious diseases among furbearer populations, other wildlife species, domestic animals, or man.

5. Provide trappers with quality wildlife-oriented experience, educational opportunity, and opportunity to utilize a renewable natural resource.

6. Receipts from permit sales go into Refuge Revenue Sharing Funds which are routed back to counties within which the refuge is located.

Adverse Effects

1. Damage to refuge access roads by trappers' vehicles during wet weather when roads are soft.

2. Occasional mortality to non-target species.

3. Some public relations problems due to a segment of the population which is opposed to trapping.

4. Cost and manpower involved in administering the trapping program.

5. Disturbance to other wildlife species caused by the presence of trappers and their vehicles near the marsh, particularly during the fall waterfowl migration.

Mitigating Measures Included in the Proposed Action

Trapping of non-target species would be minimal due to the techniques employed by most trappers. Muskrats are the primary target species and most trap sets are placed below the water surface, inaccessible to most other species. Pursuant to refuge regulations, all dead non-target species taken will be turned over to the Refuge Manager and live mammals will be immediately

released. All live raptors will be turned over to the Refuge Manager on the day taken. He will ship them to the College of Veterinary Medicine, University of Minnesota, St. Paul, MN, for research or recovery purposes.

Local public relations concerning the trapping program would be favorable since the majority of the local populace is outdoor-oriented and the program offers a place for area trappers to work and supplement their income.

Cost to the refuge in manpower and equipment and of administering the trapping program would be about $200 per year. This figure would be comparable to receipts gained from permit sales.

Disturbance to other wildlife species will be minimized by not allowing trappers to use motorboats on the marshes. Disturbance to the waterfowl sanctuary on the major pools during the waterfowl hunting season is minimized by not allowing the trappers access until after the waterfowl hunting season is over. Marshes are usually frozen by then and nearly all waterfowl have migrated.

Refuge special regulations, which are more restrictive than State regulations, are aimed at reducing the unintentional taking of non-target species without significantly hampering the operations of the trapper.

Adverse Effects Which Cannot Be Avoided

Some disturbance of wildlife on the refuge, although minimal, would occur.

Damage to refuge access roads in wet weather would necessitate annual repairs.

Occasional mortality of non-target species would occur.

Relationship Between Local, Short-term Use of Environment and Maintenance and Enhancement of Long-term Productivity

The increasing number of wetlands being drained each year due to farming, residential, and industrial construction necessitates careful management of the remaining wetlands for migrating and nesting waterfowl. Optimum habitat conditions need to be consistently available, and controlled populations of furbearers, primarily muskrats, are helpful in this endeavor. Muskrats maintain openings in dense stands of emergent vegetation for waterfowl feeding, nesting, and loafing, but an over-population can destroy too much vegetation, eliminating needed interspersion. Overpopulations of rats can also lead to interspecific strife, and reduced fur values. Trapping assists in maintaining a stable population of muskrats by removing excess individuals while leaving a self-sustaining breeding population. Therefore, long-term effects of the proposed action would only be beneficial.

Irreversible, Irretrievable Commitments

The animals trapped and removed from the refuge are irretrievable, although the population is a renewable resource.

The fossil fuel used by trappers and by refuge staff in maintenance of the program.

Alternatives to the Proposed Action

Alternative A: No Action or No Trapping Permitted. One alternative to the proposed action is no action. Under this alternative, the following are expected to occur:

1. The lack of trapping on the refuge would result in a beaver population build-up that would eventually cause the destruction of water control facilities, cause the wash-out of refuge and township roadbeds, and possibly cause disease outbreaks affecting beaver, muskrats, or man himself (tularemia).

2. The lack of trapping on the refuge would result in a severe loss of a valuable muskrat fur resource, especially in moist soil draw-down units which could otherwise be harvested. Nearly all refuge impoundments are manipulated for the encouragement of moist soil plants for waterfowl use. In so doing, muskrat habitat is severely disrupted by early and late summer draw-downs and muskrats are not expected to survive fall or winter draw-downs which are used for rough fish control, etc. Since these animals will probably die anyway, they might as well be harvested.

   When waterfowl habitat management is accomplished by water level manipulation, it may cause extremes in fluctuating water levels in a portion of refuge pools each year. Lowered water levels force muskrat populations out of one pool, for instance, and possibly into an adjacent pool, contributing to overpopulations there. Increased fighting and scarring of the pelts would then occur and extreme "eat out" pressures would contribute to uncontrollable effects on aquatic vegetation. Without an active muskrat removal program, however, muskrat populations would revert to extremely fluctuating levels and water management alone could provide adequate vegetation control only during low muskrat years. This would result in loss of vegetation control on a sustained basis. Damage to physical facilities would be expected to increase. Vegetation control by mechanical means and the use of herbicide might be accomplished, but they would be costly. Again, this type of program would provide no population control of furbearers.

Alternative B: Unlimited Public Trapping. A second alternative to the proposed action is to allow unlimited public trapping on the refuge. Although this type of system would allow a maximum harvest of furbearers, a quota would be nearly impossible to impose and enforce and overharvest could result. Enforcement of refuge regulations would be extremely difficult and access of vandals to the refuge would go uninhibited. Damage to refuge facilities, such as roads, and damage to wildlife habitat by unlimited access of vehicles and watercraft would be extensive. Lastly, disturbance to wildlife would be greatly increased.

Alternative C: Random Permittee Selection. A system similar to the proposed action, but utilizing permittee trappers selected at random would be another alternative. The only cost to the trappers would be a small percentage of their fur receipts sufficient to cover administrative costs to the refuge. The main problem with this type of system is that a random selection of trappers allows people with little or no trapping experience an equal chance for selection with experienced trappers. Also, with no initial monetary investment, there is little incentive for trappers to work toward the desired level of harvest, especially during inclement weather. The

combination of both factors would result in continual underharvest and loss of furbearer population control. Some trappers will concentrate on muskrats and raccoon, but have no interest or are not agreeable to trap beaver for instance. And of course beaver is the one species which creates the most management problems lately and needs population control.

Alternative D: Government Employed Trapping. Government employed trappers could be utilized to control furbearer populations. This method would probably be effective in maintaining stable furbearer populations, but the cost of this program to the refuge would be excessive. Also, this type of program would eliminate the opportunity for public harvest of the surplus animals, resulting in no recreational opportunities for the general public.

Alternative E: Refuge Staff Trapping. Control of furbearer populations could be undertaken entirely by refuge staff, either by trapping or shooting. Either type of program would be extremely costly to the refuge as well as placing an impossible manpower demand on a limited staff. Although the return from furs sold would partially offset the program costs, this procedure would be unacceptable to the public and again result in a large number of damaged pelts and a waste of a usable resource.

Controversial Aspects and Intensity of Public Interest

It is generally accepted that a segment of the national population opposes any trapping of wildlife for recreation or personal profit. There is no specific knowledge of any opposition to trapping on the Necedah National Wildlife Refuge.

Appendix B. Application packet cover letter.

United States Department of the Interior

U.S. FISH AND WILDLIFE SERVICE
Necedah National Wildlife Refuge
N11385 Headquarters Road
Necedah WI 54646
608-565-2551

September 29, 2014

Dear Trapper:

Attached is an application for a Refuge Fur Trapping Permit for the coming season. You are receiving this information since you have expressed an interest in our trapping program. Please notify the Refuge if you no longer wish to be included on this list. Please carefully read the attached refuge specific trapping regulations, trapper note about trapping area descriptions, trapping area map, water level conditions and planning summary, and your application.

Please read these documents carefully and, if you wish, fill out the application form and return it to this office by 4 PM Friday, October 10, 2014. Applications will then be evaluated. Eligible applicants will be entered in a drawing to determine the eleven trappers who will receive permits in which areas.

Changes this year include:

- Restructuring of units to now total 11
- Units indicated with a * will require beaver removal.
- Text editing and clarifications throughout
- Clarification on migratory waterfowl units, dates open, and staking permitted.
- Contacts updated
- Applicants can now check if they are applying as the primary permittee or the helper.
- Completed Weekly Trapping Reports will continue to be emailed in to Katie Goodwin at Katie_goodwin@fws.gov or dropped off during the week following the reported trapping period.
- There is now no minimum required number of weeks trapped, but all permit holders are required to notify the refuge when they are finished trapping.

A minimum of one youth mentored application will be drawn and given a priority trapping unit. All remaining eligible applications will be entered into the drawing. Remaining trapping units will be assigned to each applicant who is successful in the drawing in the same order that the applications are drawn. The first applicant will be assigned to the trapping unit of highest priority choice as listed on his/her application that is available. The second and succeeding applicants will be assigned to their highest priority choice still available and so on.

Successful applicants will be notified by phone and/or email immediately after the drawing. Successful applicants will be allowed to exchange or forfeit their trapping units if the refuge is notified by both parties concerned prior to the issuance of the permits or if the need arises without penalty. Applicants who have accepted their unit will need to schedule a date and time to meet with Katie Goodwin, Visitor Services Manager, to issue your permit.

As in prior years: **Trappers MUST complete and submit weekly reports as well as notify the refuge when they are done trapping in their unit.** Failure to do so will render a trapper and partner ineligible in future years.

A $35 fee is required of each permittee. No fee is required of the helper. Fees will be collected at the refuge office at the time permits are issued.

Sincerely,

S//Douglas Staller

Douglas Staller
Necedah National Wildlife Refuge Manager

Necedah National Wildlife Refuge
Where Wildlife Comes First

Appendix C. Note to trapper on water levels and management plans for units open to hunting.

Pool Elevations/Trapping Units 2014

Necedah National Wildlife Refuge

Unit 1

Camp road Pool, Pool 9 and Pool 19 were raised to full pool after spring run-off in April and maintained at that elevation until late September. After October 1st these pools will be gradually lowered 0.5' to 1.5' to enhance feeding opportunities for migratory birds during the fall migration. These pools will be raised in late November to an elevation 0.5' to 1.0' below full pool for winter freeze up.

Unit 2

Rogers Pool, Pool 18, Pool 13 and other smaller pools in this unit have been held at full pool during the spring and summer months. Pool 18 and pool 13 will be gradually lowered during the fall migration to improve feeding opportunities for migratory birds and then raised to 1.0' below full pool for winter freeze up.

Unit 3

Due to adequate to above normal precipitation the pools and ditches in this unit have been full to overfull during the spring and summer months. The refuge has no control of water levels in this unit so elevations will be weather dependent.

Unit 4

Goose pool, West Sprague pool, Main Sprague and East Sprague pool have been managed at full pool during the spring and summer months. These pools will be gradually lowered after October 1st to provide feeding opportunities for migratory birds during the fall migration. Before winter freeze up elevations will be raised to 1.0' below full pool.

Expected construction on East Sprague pool may require the pool being de-watered during the fall and winter months. East Sprague pool will be gradually re-flooded after construction is completed.

Killdeer Pool has been maintained at full pool during spring and early summer then will be lowered in September to attract migratory birds during the fall migration. Winter elevation will be set at about 6" below full pool.

Trapping will not be allowed until after November 28th in this unit due to the high volume of migratory bird use.

Unit 5

Rattail pool and the ditches in this unit have been full to over full during the spring and summer months. The refuge does not manipulate water levels in this unit so water levels will be precipitation dependent.

Unit 6

Canfield Pool and associated ditches have been drained to facilitate the placement of a new water control structure and completion of dike repairs. Construction remains ongoing and will be completed as soon as soil conditions permit.
Canfield pool will be gradually re-flooded after dike construction is completed.

Carter Woggen pool has been managed as full as possible during spring and early summer. This pool was lowered 1.5' to facilitate the construction on the Canfield pool to the north. This pool will be raised to 1.0' below full pool for winter freeze up.

Unit 7

The wetlands and ditches in this unit have been full to over full during spring and summer months due to above average precipitation. Water levels in the ditches and wetlands in this unit are not manipulated by the refuge so expect water supply to be weather dependent.

Unit 8

Pharm pool and the ditches in this unit have been at full during the spring and summer months. After October 1st this pools will be partially drawn down to increase feeding opportunities for migratory birds during the fall migration.
Becker pool was managed in a semi-drained condition because of a deteriorated dike system. Expect this pool to be managed at below normal elevations until repairs can be completed.

Unit 9

Rynearson Pool 1 was raised to full pool after spring run-off and was maintained at that elevation during the summer months. Beginning In mid-September this pool will be gradually lowered to provide enhanced feeding opportunities for migratory birds. During late November or before winter freeze-up this pool will be raised to 1.0' below full pool to provide water storage capacity for the 2015 spring run-off.

Rynearson Pool 2 was raised to full pool after the spring run-off period and was maintained at that elevation until mid-May. After that the pool was gradually drained to provide adequate conditions for the germination of moist-soil plants. This pool was maintained in a drained condition during the summer months until re-flooding was

initiated in mid-September to provide feeding opportunities for migratory birds. The pool elevations will continue to raise in 0.5' increments until the completion of the fall migration period and then be set at 1.0' below full pool for winter freeze-up.

Upper and Lower Rice pools have also been raised to full pool elevations and maintained at that elevation during the spring and summer months. These pools will be gradually lowered 0.5' to 1.5' after October 1st to enhance feeding opportunities for migratory birds.
Trapping will not be allowed in this unit until after November 28th due to high volume of migratory bird use.

Unit 10

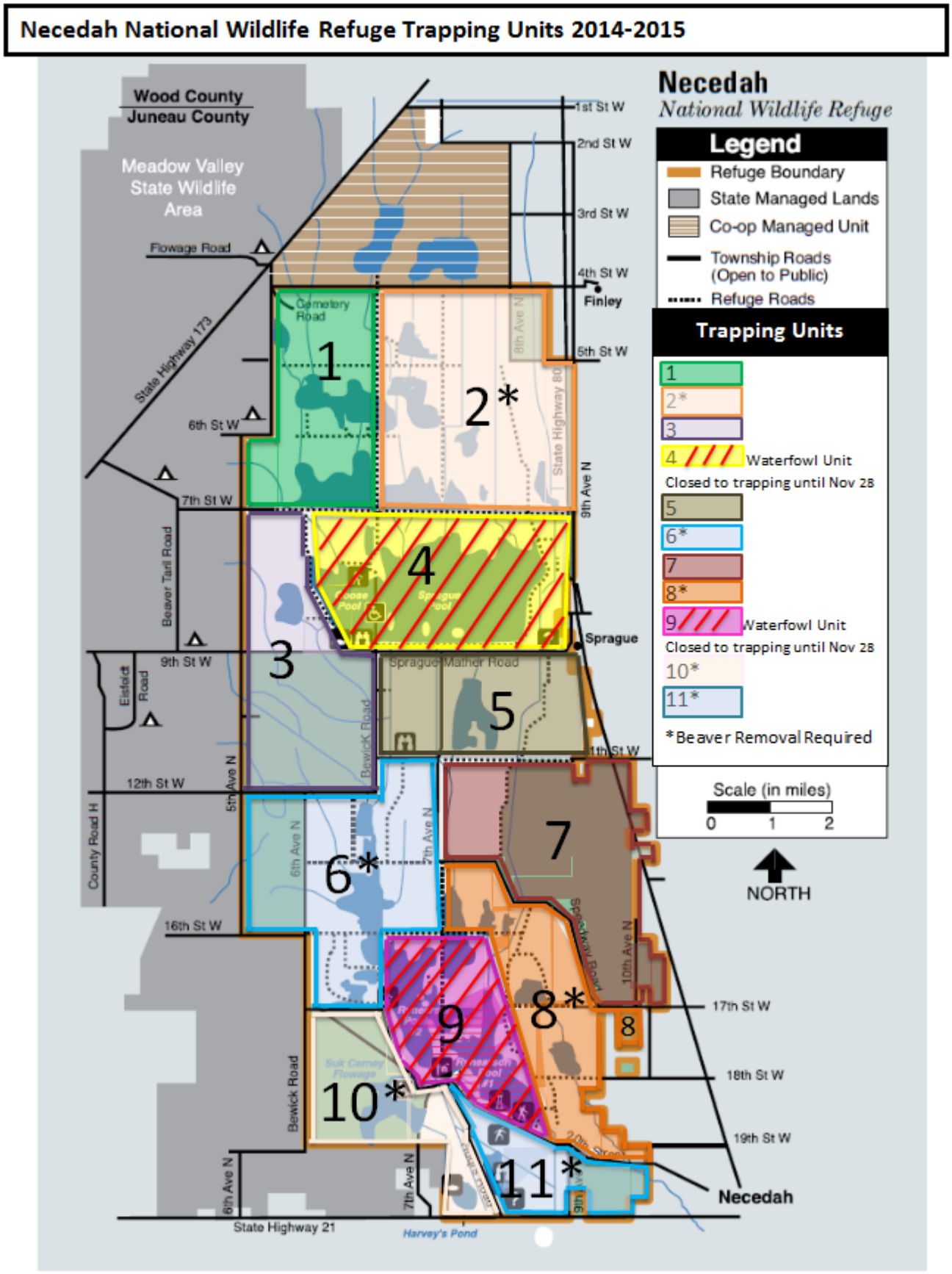
Suk Cerney pool was raised to full pool during early spring and excess water was diverted to the DU cells to the south. The pool will be gradually lowered during late September and early October to provide feeding opportunities for migratory birds with the fall migration. The pool will be raised to 1.0 foot below full pool for winter freeze up.
DU 1 impoundment has been managed at full pool during spring and summer months and will be lowered to provide migratory birds enhanced feeding opportunities and to facilitate the repair of the dike system. Expect construction to continue during the winter months.
DU 4 impoundment located north of highway 21 and west of headquarters road has been in a semi-drained condition due to dike construction and control structure re-placement. Expect this area to be gradually re-flooded after October 1st.

*****Warning: A Partners for Fish and Wildlife habitat restoration project is adjacent to the Refuge on the west end of this unit. The dike continues from Refuge lands onto private land. Trapping is not allowed on the private land. Two Partners for Fish and Wildlife signs are posted on this property boundary. Do not go west of these signs.**

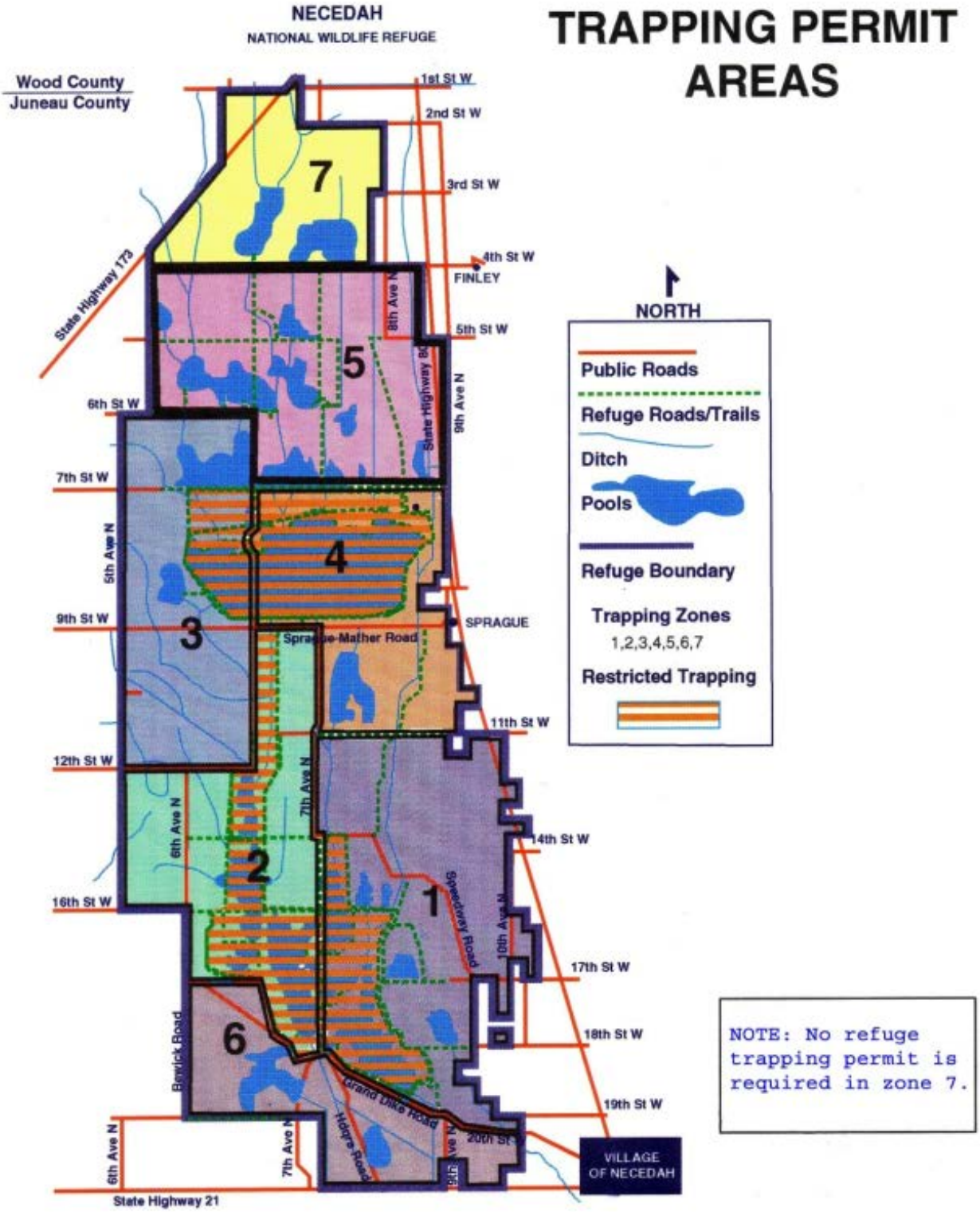
Unit 11

DU impoundments 5 and 6 on the east side of the Headquarters Road were raised as much as possible during spring run-off to provide feeding and resting areas for migratory birds. Pool elevations were lowered during the summer months to facilitate tree removal and repair of the dike system. Expect below normal elevations here as construction/repairs continue during the fall and into 2015.

Appendix D. Trapping permit areas, FY2015.



Appendix E. Trapping permit areas prior to FY2015.



Appendix F. Application for refuge fur trapping permit.

DEPARTMENT OF THE INTERIOR
U.S. FISH AND WILDLIFE SERVICE

APPLICATION FOR REFUGE FUR TRAPPING PERMIT

Notice

In accordance with the Privacy Act of 1974, 5 U.S.C. 552a please be advised that:

1. The permitting of trapping on lands of the National Wildlife Refuge is authorized by the National Wildlife Refuge System Administration Act (16 U.S.C. 668dd-668ee) and the Refuge Recreation Act, 16 U.S.C. 460k-3; implemented by regulation in 43 CRF 24.3 and 50 CFR 31.16.
2. The application form will be used by Service personnel to evaluate the qualifications and conclude the eligibility of each applicant.
3. Routine use disclosures may also be made (1) to the U.S. Department of Justice when related to litigation or anticipated litigation; (2) of information indicating a violation of a statute, regulation, rule, order, or license, to appropriate Federal, State, or foreign agencies responsible for investigating or prosecuting the violation or for enforcing or implementing the statute, rule, regulation, order, or license; (3) from the record of an individual in response to an inquiry from a Congressional office made at the request of that individual (42 FR 19083; April 11, 1977).
4. The information requested in this application form is purely voluntary, but failure to answer questions may jeopardize the eligibility of individuals to receive permits.

Refuge name, address, and telephone number:

Necedah National Wildlife Refuge
N11385 Headquarters Road
Necedah, WI. 54646

PH: 608/565-2551

SECTION 1 TO BE COMPLETED BY APPLICANT (helper must also complete an application)

NAME: _____ AGE*_____

*Applicant must have obtained the age of majority in the State in which trapping will occur.

Applying as (check one): PRIMARY PERMIT HOLDER: _____ HELPER: _____
ADDRESS: STREET/BOX:
_____

CITY: _____

TELEPHONE: _____ EMAIL:_____

NAME OF HELPER: _____

and/or MENTORED YOUTH:_____

(Note: Partnerships must be authorized by the Refuge Manager, and each helper must complete an application.)

SECTION 2 Previous Trapping Experience

1. Species: List the estimated average annual number of each kind of animal trapped in the previous five-year period.

Species	Number	Species	Number
Raccoon	_____	Otter	_____
Beaver	_____	Opossum	_____
Muskrat	_____	Weasel	_____
Mink	_____	Skunk	_____
Fox	_____		

2. List the approximate number of each size and type of trap you will have available for use on the refuge during the coming trapping season:

Body-Grip (Conibear):
size 110 _____
size 220 _____
size 330 _____

Steel foot-hold jump:
size 1 _____
size 1½ _____
size 2 _____
size 3 _____

Steel foot-hold long-spring:
size 1 _____
size 1½_____
size 2 _____
size 3 _____
size 4 _____

Steel foot-hold coil spring:
size 2 _____
size 3 _____
size 4 _____

Enclosed trigger traps: _____

Other Traps (Type, Size and Quantity):_____

3. List species you intend to trap this season:

4. Have you been convicted or plead guilty of a State or Refuge State or Federal Wildlife violation within the last 5 years? _____

5. If yes, please explain:

6. Would you trap specific furbearers in designated trouble spots in the fall while trapping other furbearers, if you were officially requested to do so by refuge staff?

7. If so what species of furbearer would you be willing to assist with?

Species	Number	Species	Number
Raccoon	_____	Otter	_____
Beaver	_____	Opossum	_____
Muskrat	_____	Weasel	_____
Mink	_____	Skunk	_____
Fox	_____	Snowshoe Hare	_____

8. Please list one person (not related to you and other than your helper) who has knowledge of your trapping experience and qualifications. (Include name, address, and home and business telephone numbers.)

   _____

   _____

9. Do you have, or can you obtain, the necessary equipment specified in the special refuge trapping conditions? _____

10. Referring to the attached map, list below your choice of refuge trapping units in order of your preference. If you are successful, you will be assigned to the trapping unit of your highest available preference. If you do not want a specific trapping unit, please enter "N" next to that Unit #.

_____ Unit #1	_____ Unit #2	_____ Unit #3	_____ Unit #4
_____ Unit #5	_____ Unit #6	_____ Unit #7	_____ Unit #8
_____ Unit #9	_____ Unit #10	_____ Unit #11	

SECTION 3

I certify that I have read and understand the general and specific conditions and regulations contained in the sample trapping permit supplied herewith, and agree to abide by these provisions. I certify that all of the statements made in this application are true, complete, and correct to the best of my knowledge and belief, and are made in good faith. I understand I may be disqualified if any information on this application is found to be false.

Signature of Applicant_____Date:_____

Signature of Mentored Applicant_____Date:_____

Signature of Mentored Youth Parent or Gaurdian_____Date:_____

To be completed by Refuge Manager:

Qualified_____
Unqualified_____
Date & Initials_____
Reasons for disqualification to be attached.

Appendix G. Special conditions supplement to trapping permit.

NECEDAH NATIONAL WILDLIFE REFUGE TRAPPING REGULATIONS

Special Conditions Supplement to 2014-2015 Trapping Permit

REFUGE TRAPPING IS ALLOWED BY SPECIAL USE PERMIT ONLY. Violation of any State or Federal game law in conjunction with this permit will result in revocation of current trapping permit and disqualification from refuge trapping in future seasons. The following conditions apply to all trappers:

1. Trapping season begins October 18, 2014 and closes March 31, 2015. All state seasons and zones apply.

2. Trapping of badger, coyote, wolf, fisher, and bobcat is prohibited.

3. Enclosed trigger traps and box/cubby/cage sets, that comply with the State regulations may be used during the entire trapping season. Any other dry land sets, size #2 or smaller, using foot hold traps may be used after the Wisconsin gun deer hunting season. All traps and capture devices must comply with State regulations and must have the required trapper identification. Illegal traps may be seized at any time.

4. To protect the non-target species, blind-trail sets are prohibited on upland sites. Cluster sets may be used provided the trap or all traps in a cluster set are completely or partially submerged in water. Every effort will be made to prevent the capture of non-target species. However, if an unauthorized animal is found alive and in satisfactory condition in a trap, it shall be immediately released, and reported in the weekly trapping report under "other" with release date. Animals found dead or seriously injured in the traps shall be reported to and disposed of as designated by the Refuge Manager. Please call Doug Staller at 608-565-4400 and reported in the weekly trapping report under "other".

   Use of any .22-caliber or smaller rim fire firearm is only permitted to dispatch animals in traps.

5. No animals or parts shall be disposed of on the Necedah National Wildlife Refuge.

6. Sight-exposed bait is prohibited.

7. Trap setting and inspection shall occur between one-half hour before sunrise and one-half hour after sunset, unless otherwise specified by State or refuge permit provisions. At the close of the trapping season the permittee shall remove all traps and equipment from the refuge.

8. Trappers must comply with State regulations regarding trap check frequency.

9. The permittee may cut stakes on the refuge from live willow, aspen, cottonwood and alder under 2 inches in diameter, for use as bait or trap stakes. Deadwood of any species less than 2 inches in diameter may be cut and used in trap sets.

10. "Authorized Trapper Vehicle Card" must be displayed in the front window of vehicle when trapping.

11. Refuge gates must be left closed and locked. The permittee will be given combinations to locks for only those gates they are authorized to use.

12. Interior refuge roads are open to the use of highway licensed vehicles ONLY. No ATVs or UTVs

13. Vehicles are not allowed off road within the refuge.

14. Each permittee will be allowed one additional person to assist in the trapping operation. This additional person shall carry on their person a copy of the permittee's refuge permit, while on the refuge. The helper may run portions of the trapline alone or with the permittee. The vehicle permit card issued to the primary permittee for a personally-owned vehicle may be used, if the need arises, in a vehicle owned by the helper, provided the permit card is prominently displayed in the front window of the vehicle. Vehicles may be shuttled from point to point; however, only one vehicle may be used behind refuge gates at a time, as only one vehicle permit card will be issued to each primary permittee.

15. While in the field, all trapping permittees and their helper must wear both a hat and outer jacket or vest which must be at least 50% blaze orange during the Wisconsin gun deer and muzzle loader hunting season.

16. Eleven refuge trapping unit permits will be issued for the 2014-15 season. See the attached map.

17. During the waterfowl migration, or until such a time as approved by the Refuge Manager, trapping is restricted from all pools and adjacent shorelines within the area designated with hash marks on the attached map. Trapping is permitted in this area after Nov 28. Prior to that date trappers may enter the area and mark muskrat runs so that they can be found and trapped under snow covered ice.

18. Trapping activity may be halted or restricted by the Refuge Manager at any time during the season for emergency situations.

19. Permittee will submit **weekly** reports to the Refuge Manager. The "trapping week" runs from Saturday to Friday. These reports include target species, non-target species, weeks not trapped and in the event the permitee is no longer trapping, the trapper is **required** to notify the refuge by checking the appropriate line on the report. Reports are now in paper

and electronic form and can be emailed to Katie Goodwin at katie_goodwin@fws.gov Please drop off or email reports during the week following the reported trapping week.

20. The United States Fish and Wildlife Service (USFWS) is not responsible for any loss or damage to property, or for any injury to the permittee. Employees of the USFWS will continue to perform normal duties in all areas.

21. Failure of a permittee to comply with any of the provisions or with any applicable Federal or State law or regulation may disqualify the individual from permits for other refuge uses. The permit may be revoked or suspended by the issuing officer for just cause, such as violation, non-compliance with permit conditions, or nonuse.

All General Conditions on the back of the Trapping Permit apply. Failure to comply with any of the General Conditions or Special Conditions Supplement to the Trapping Permit may be grounds to declare a permittee ineligible for permits in the future.

Appendix H. Weekly fur trapping report.

Weekly Fur Trapping Report

Necedah National Wildlife Refuge

Please complete this report each week as required under the conditions of your refuge trapping permit. Either drop off your report at Refuge Visitor Center (open Monday through Saturday 9:00am to 4pm) or mail to Necedah National Wildlife Refuge, N11385 Headquarters Rd. Necedah, WI 54646. **Because trapping season opens on a Saturday, the Trapping Report week runs from Saturday through Friday.**

Trapping Week/ Dates:_____ Trapping Unit Number:_____

	Total number caught this week	Average number of traps set per day. **	Number of days trapped
Muskrat			
Mink			
Raccoon			
Beaver			
Otter			
Other:_____			

Below: List each species and number of **"other"** animals caught this week:

** Report the average number of traps set **daily** for each target species.

Please check here if no trapping activity took place this week: _____

I did not trap because _____

Please check here if you are finished trapping in this unit: _____

Print Name: _____Signature: _____
Phone Number: _____

2014 – 2015 Trapping Weeks and Corresponding Dates

Week	Date
1	October 18-24
2	October 25 – October 31
3	November 1 – 7
4	November 9 – 14
5	November 15 – 21
6	November 22 – 28
7	November 29 – December 5
8	December 6 – 12
9	December 13 – 19
10	December 20 – 26
11	December 27 – January 2
12	January 3 – 9
13	January 10 – 16
14	January 17 – 23
15	January 24 – 30
16	January 31 – February 6
17	February 7 – 13
18	February 14 – 20
19	February 21 – 27
20	February 28 – March 6
21	March 7 – 13
22	March 14 – 20
23	March 21 – 27
24	March 28 – 31

Appendix I. Reported numbers of furbearers trapped on Necedah National Wildlife Refuge, FY1950-2015. No. units = no. of units trapped, one permittee per unit.

Year	No. units	Mink	Musk-rat	Beaver	Raccoon
1950	0	0	0	0	0
1951	2	3	88	0	24
1952	0	0	0	0	0
1953	0	0	0	0	0
1954	1	1	29	0	0
1955	1	10	72	0	0
1956	1	19	54	0	7
1957	2	8	82	58	26
1958	1	24	138	57	64
1959	1	33	102	84	71
1960	1	21	204	45	54
1961	0	0	0	32	0
1962	1	9	110	106	40
1963	1	40	409	86	70
1964	1	5	636	30	17
1965	1	1	0	16	50
1966	1	11	34	0	24
1967	2	14	212	20	60
1968	4	8	76	58	96
1969	3	5	628	0	171
1970	4	2	118	72	5
1971	4	9	637	33	31
1972	4	20	700	63	17
1973	6	21	588	70	122
1974	6	37	848	45	386
1975	6	48	269	39	124
1976	6	22	40	28	154
1977	6	12	26	33	261
1978	6	41	75	36	118
1979	6	32	494	31	86
1980	6	11	639	87	33
1981	6	59	2332	97	98
1982	6	77	1122	44	135
1983	6	21	374	43	36
1984	6	31	466	59	47
1985	5	31	369	66	132
1986	5	5	449	107	80
1987	6	9	1411	110	77
1988	6	14	412	87	88
1989	6	3	189	65	31
1990	6	12	541	139	49
1991	6	16	855	76	126
1992	6	5	111	34	56
1993	6	12	949	85	55
1994	6	11	420	36	74
1995[a]	6	2	13	18	46
1996[a]	--	8	28	88	126
1997[b]	--	--	--	--	--
1998	6	16	193	36	112
1999	3	1	115	16	21
2000	5	7	464	32	60
2001	3	3	430	26	116
2002	5	8	650	40	80
2003	6	5	244	30	99
2004	6	14	60	38	136
2005	3	1	32	16	34
2006	6	6	216	27	12
2007	6	12	629	45	51
2008	5	5	79	22	69
2009	6	24	569	55	80
2010	5	7	217	37	56
2011	4	2	306	27	41
2012	6	7	569	16	60
2013	6	29	651	47	101
2014	6	5	93	44	36
2015	11	1	55	21	21

[a] Numeric data unavailable; approximated data extrapolated from graph in refuge annual report.

[b] Data unavailable.

Appendix J. Statewide furbearer harvest in Wisconsin, FY1992-2014.

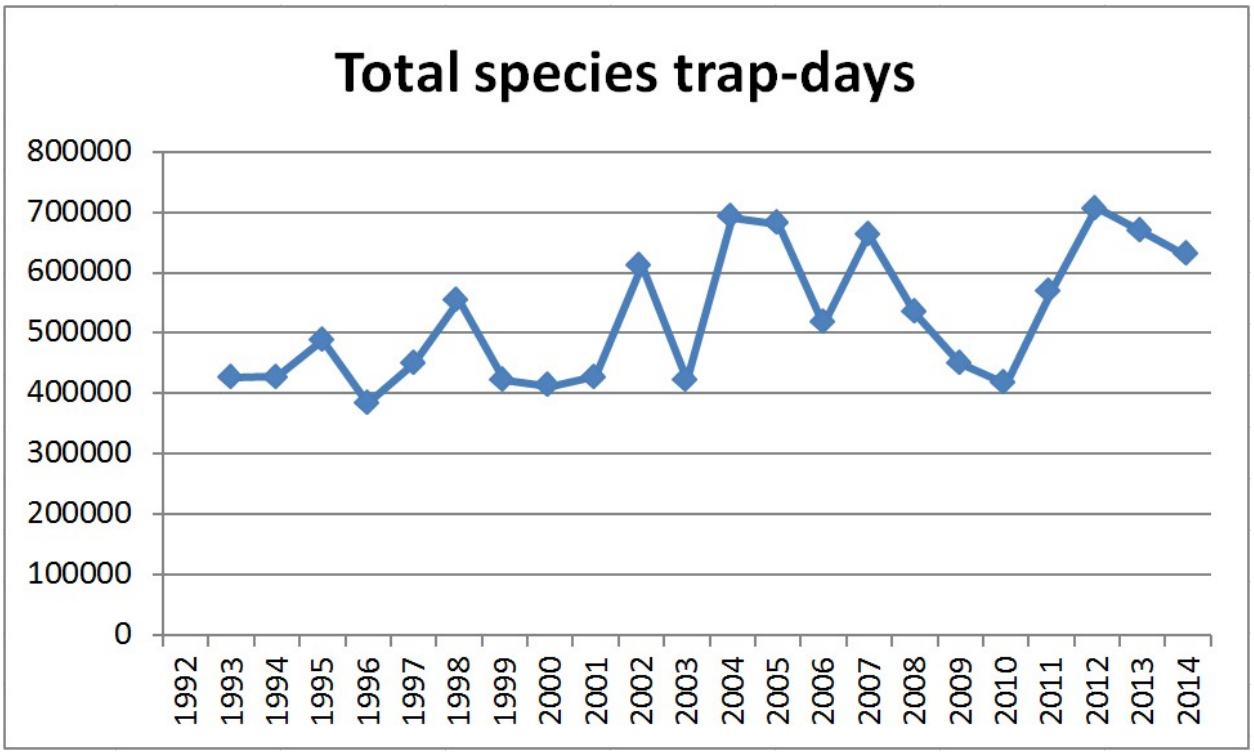


Figure 1a. Estimated statewide trapping effort for furbearers in Wisconsin, winters FY1992-2014. Values are grand totals of number of trap-days for 11 species in Figs. 2b and 2c (trap-days for beaver are not included). Data are from Dhuey (1993-2002), Dhuey and Olson (2003-2014a), and Simon-Borgerding (1992).

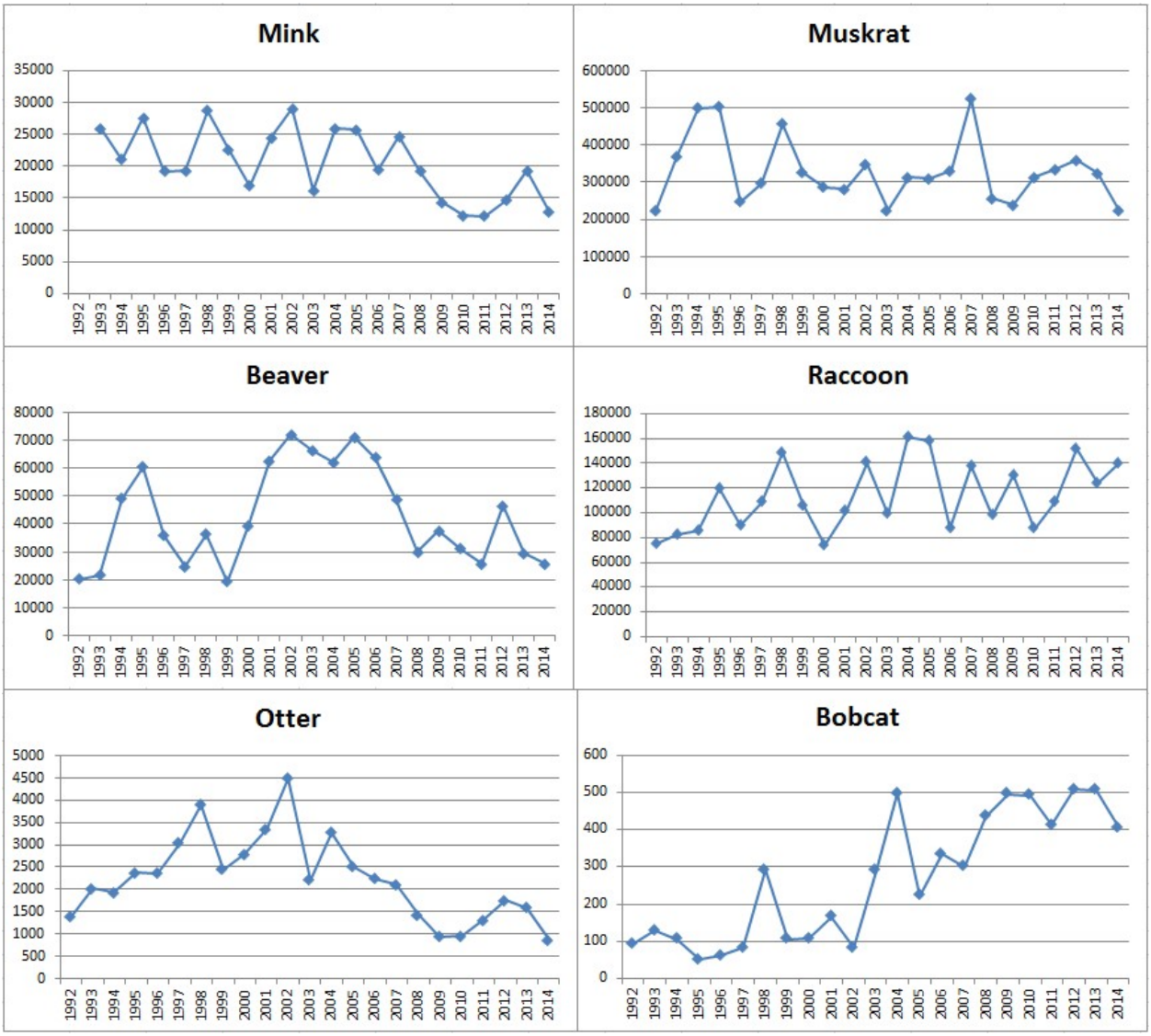


Figure 1b. Estimated statewide harvest of indicated furbearer species from trapping in Wisconsin, winters FY1992-2014 (data from Dhuey 1992-2002, 1993-2002; Dhuey and Olson 2003-2014a,b; and Simon-Borgerding 1992).

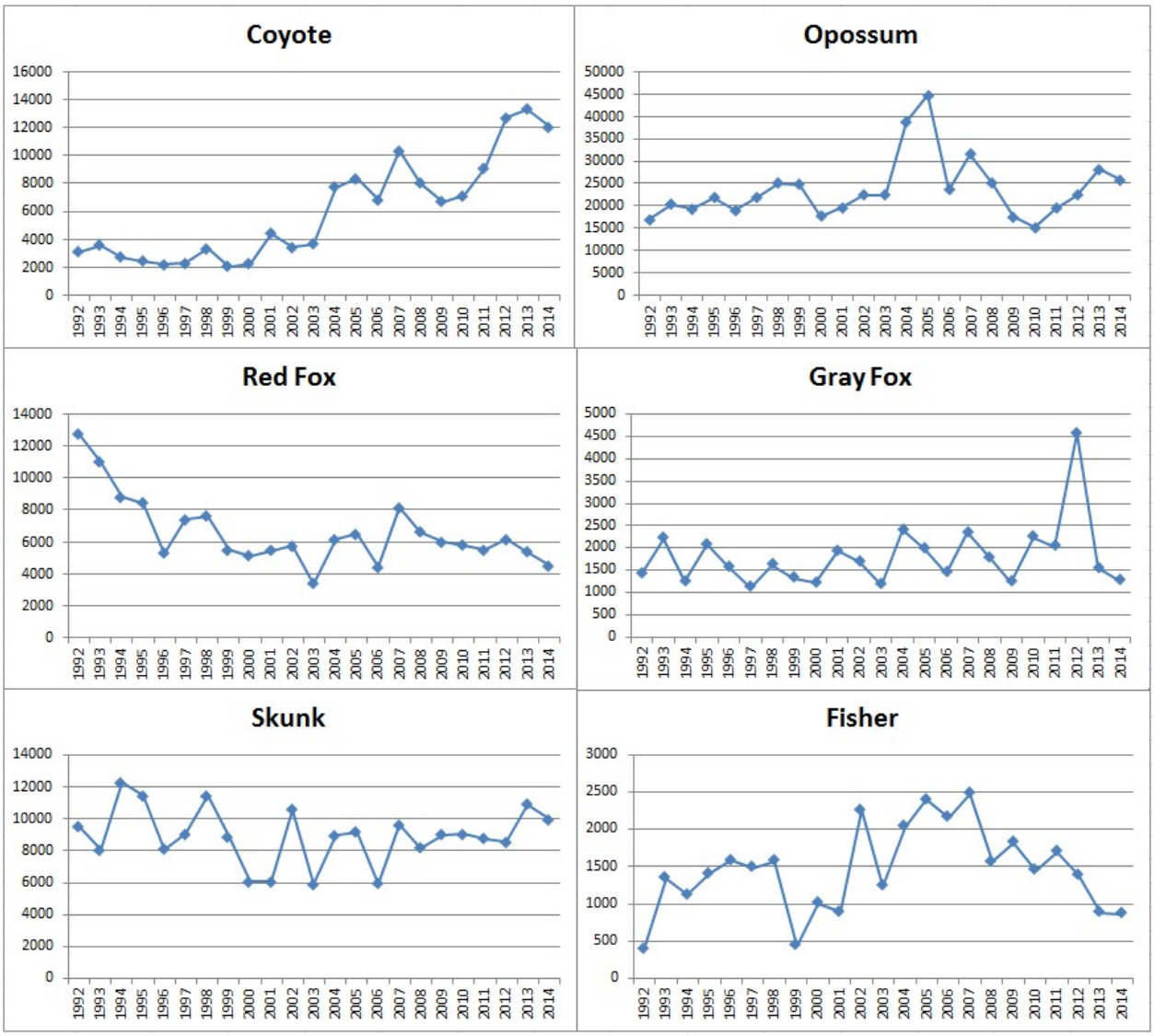


Figure 1c. Estimated statewide harvest of indicated furbearer species from trapping in Wisconsin, winters FY1992-2014 (data from Dhuey 1993-2002, Dhuey and Olson 2003-2014a, and Simon-Borgerding 1992)..

Appendix K. Winter track count survey of north-central Wisconsin (DNR Southern Region). Number of tracks observed per transect, 1998-2014. Number of transects run per winter in parenthesis. From Dhuey (2014b).

Winter[a]	Bobcat	Coyote	Fisher	Fox	American Marten	Otter	Wolf	Snowshoe Hare[b]	Weasel[b]
1998-99 (3)	0	2.67	0	0.33	0	0	0	0	--
1999-2000 (4)	0	4.25	1.5	3	0	0.5	1	1.75	--
2000-01 (3)	0	2.67	3	0.33	0	0.67	0.33	3.67	--
2001-02 (0)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--
2002-03 (0)	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	--
2003-04 (6)	0	5.33	3.33	2.67	0	0.33	0.67	1.67	0.67
2004-05 (5)	0	6.8	5.6	2.6	0	0	0.4	1.2	1.2
2005-06 (6)	0.33	5.17	8.67	2.17	0	0.83	1.17	3.67	1.5
2006-07 (5)	0.2	9.8	6	3	0	0.4	0.2	4	1
2007-08 (7)	0.29	6.71	3.57	1	0	1	0.14	1	1
2008-09 (6)	0.58	6.08	4.75	1.58	0	0	1.17	1.25	1
2009-10 (3)	0	9.33	0.33	0.67	0	1	0.67	0.33	0.67
2010-11 (4)	0.25	7.25	3.25	2.0	0	0.25	1.0	0.25	1.75
2011-12 (4)	0	14.0	2.75	0.75	0	0.75	0.25	1.0	2.25
2012-13 (7)	1.43	10.86	0.71	1.29	0	0	1.00	0.14	1.29
2013-14 (6)	0.25	7.75	0.33	1.83	0	0.75	1.08	1.58	0.50

[a] Snow conditions in the southern region make it difficult to run track transects. Ten transects were established in the southern region in 1998-99 but not all have been able to be run.

[b] Snowshoe hare and weasel tracks were not counted; this column represents the number of one-half mile transect sections containing snowshoe hare tracks.`

Appendix L. Wisconsin trapping seasons and bag limits, 2014-15 (federal FY2015).

Species	Season dates	Bag limit
Mink	October 25 – March 8	No limit
Muskrat	October 25 – March 8	No limit
Beaver	November 1 – March 31	No limit
Raccoon	October 18 – February 15	No limit
Otter	November 1 – March 31[a]	1
Fisher	October 18 – December 31[a]	1
Bobcat	October 18 – January 31[a]	1
Red and gray fox	October 18 – February 15	No limit
Coyote	October 18 – February 15	No limit
Gray wolf[b]	October 15 – February 28[a]	1
Opossum	Open year-round	No limit
Skunk	Open year-round	No limit
Weasel	Open year-round	No limit

[a] Season closes when zone or state harvest quota is reached.

[b] Gray wolf was a federally listed endangered species prior to FY 2013, then delisted, then relisted after the FY2015 season.