INTEGRATED PEST MANAGEMENT PLAN

KULM WETLAND MANAGEMENT DISTRICT

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INTEGRATED PEST MANAGEMENT PLAN
Kulm Wetland Management District
FY 2004

Introduction

The Kulm Wetland Management District (WMD) lies in south-central North Dakota and includes the counties of Dickey, LaMoure, Logan, and McIntosh. Situated in the heart of the Prairie Pothole Region, the WMD plays an important role in supporting to the continent's breeding waterfowl population as well providing habitat for many other grassland and wetland dependent avian species.

Currently, the WMD contains 200 Waterfowl Production Areas (WPAs) totaling 45,043 acres and 1 Wildlife Development Area (hereafter included with any reference to WPAs) equaling 631 acres. These lands are owned in fee title by the U.S. Fish and Wildlife Service (Service) and the WMD staff is responsible for all management activities, including pest plant control, which occur on these areas.

Departmental policy allows for the use of pesticides only after full consideration of alternatives based on competent analyses of environmental effects, safety, specificity, effectiveness, and costs (7 RM 14). It is the intention of the WMD staff to continue to explore all reasonable alternatives to each proposed application of agricultural chemicals and to strive to reduce the pounds of active ingredients (pounds AI) of herbicide applied to Service lands.

Noxious weeds are defined by the North Dakota Noxious Weeds Law (Chapter 63-01.1 ND Century Code). A December 15, 1986 (revised 1995) agreement between the Governor of North Dakota and the Service Region 6 Director also addresses the control of noxious weeds. Specifically, the agreement says "The U.S. Fish and Wildlife Service agrees to control weeds and respond to weed control complaints and requests on Service lands in accordance with the North Dakota State Noxious Weed Laws, subject to availability of funds and applicable federal law."

Other species which sometimes congregate in numbers as to warrant the label "pest" include red-winged blackbirds and resident Canada geese. WPAs often times contribute to real and perceived depredation of neighboring crops by providing breeding and resting habitats. Complaints received at the WMD office from neighboring landowners are referred to the U.S. Department of Agriculture's Wildlife Services agency.

Objectives

The following table summarizes the pest plants of concern in the Kulm WMD, the desired level of control for which we strive, and the action threshold which is usually reached before we act. To "contain/control" means to prevent the weed from either spreading on other areas of the WPA or to neighboring lands. For the action threshold, "known infestations" refers to areas where either the weed is negatively impacting the habitat to a point where it is degrading its value to wildlife, or where we anticipate that no action will result in a complaint from a private landowner

or the county weed board; "complaints" is self-explanatory. Failure to respond to complaints in a timely and effective manner often results in a congressional inquiry. Salt Cedar and Yellow Toadflax have not been confirmed in the WMD to date, but are included because they are spreading in this direction.

Species	Desired Level of Control	Action Threshold
Canada Thistle	Contain/Control	Known infestations; complaints
Leafy Spurge	Contain/Control	Known infestations; complaints
Absinth Wormwood	Contain/Control	Known infestations; complaints
Purple Loosestrife	Eradicate	Discovery on Service lands
Salt Cedar	Eradicate	Discovery on Service lands
Spotted Knapweed	Eradicate	Discovery on Service lands
Russian Olive	Eradicate	Discovery on Service lands
Yellow Toadflax	Eradicate	Discovery on Service lands

Pest Biology

(The following descriptions were adapted from the South Dakota/Nebraska Weed Identification Guide produced by the SD Black Hills Resource Conservation and Development Weed Committee (RC&D) and the North Central Nebraska RC&D, 1994).

Canada Thistle **(Cirsium arvense)**

Canada thistle is a perennial, reproducing by readily sprouting, deep, horizontal rhizomes and seed. Stems are 1 to 4 feet tall, hollow, and branching near the top. Leaves are alternate, oblong to lance-shaped, very irregular and deeply cut, with spine-tipped to smooth margins. Flowers are numerous, approximately ½ to 3/4 inches across and vary from light lavender to rose purple (occasionally white). Canada thistle differs from other true thistles in that there are male and female plants. Bracts on the flower cup are spineless. Seeds are about 1/8 inch long, somewhat flattened and brownish with a tuft of hairs on the top. Seeds are viable in as few as 7 to 10 days after flowering. One plant, left uncontrolled, can grow into a ½ acre patch in 3 years. Canada thistle is a native of southeastern Eurasia and North Africa and is adaptable to most sites. It is an aggressive and difficult plant to control and is the most severe noxious weed problem in the WMD.

***Leafy Spurge* (Euphorbia esula)**

Leafy spurge is a perennial, reproducing by seed and rootstocks. Roots are brown, with pink buds that may reproduce new shoots or roots. Stems grow 3 feet , are thickly clustered, and contain poisonous milky juice that can irritate human skin, cause hair loss around the hooves of horses and cattle, irritate the mouth and digestive tract, and may cause death. Leaves are alternate, entire and narrow. Flowers are yellowish-green, in clusters and enclosed by paired, heart-shaped, yellowish-green bracts. Seeds are contained in a 3-celled capsule. Seed capsules explode when ripe, projecting seed up to 15 feet. Leafy spurge is a native of Eurasia and is readily adaptable to a variety of sites.

***Absinth Wormwood* (Artemisia absinthium)**

Absinth wormwood (a.k.a. American wormwood) is a perennial, reproducing by rootstocks and seed. Roots are extremely heavy and fibrous. Stems are 2 to 4 feet tall, much branched and covered with fine gray hairs, giving the plant a grayish appearance. Lower leaves are alternate, hairy, deeply divided and toothed, with long petioles. Upper leaves have short or no petioles. Flowers are pale yellow, numerous, drooping and short stalked, about 1/16 inch across. Seeds are cylindrical and narrow based with a round top. Absinth wormwood was used by immigrants as an ornamental and culinary or medicinal herb. Absinth wormwood is a native of Eurasia and commonly invades grasslands and wooded areas.

***Purple Loosestrife* (Lythrum salicaria)**

Purple loosestrife is a perennial, reproducing by seeds and rootstocks. Roots are rhizomes that form a dense mat. Stems are erect, 4-sided, appear woody at the base, are numerous and branched and grow 3 to 8 feet tall. Leaves are opposite or whorled, lance-shaped and simple, with smooth edges. Flowers are rose-purple in terminal spikes. Seeds are egg-shaped and very small. Purple loosestrife is an aggressive invader of aquatic sites and reduces wildlife habitat in wetlands and waterways. Purple loosestrife is a native of Eurasia and Africa and is often grown as an ornamental. No known plants occur on WPAs in the WMD.

***Yellow Toadflax* (Linaria vulgaris)**

Yellow toadflax is a perennial, reproducing by seed and underground rootstocks. Roots are woody, vigorous, well-branched rhizomes with many lateral shoots. Stems grow 1 to 2 feet tall, with few branches, are light green, smooth and erect. Leaves are alternate, light green, numerous, narrow, smooth, pointed, and attach directly to the stem. Flowers are yellow and of the snapdragon type, with 2 lips, a long spur and an orange, bearded throat. Seeds are brownish-black, round, flattened and rough, with a papery circular wing. Yellow toadflax is an escaped ornamental that is very invasive. It is a native of Eurasia and is readily adaptable to a variety of sites. No confirmed occurrences of this plant on any WPA in the WMD to date.

(Information on salt cedar gleaned from the Plant Conservation Alliance Alien Plant Working Group webpage)

***Saltcedar* (Tamarix aphylla)**

Saltcedar is a deciduous evergreen shrub or small tree that can grow to 50 feet tall and is characterized by slender branches and gray-green foilage. The bark of young branches is smooth and reddish brown and becomes brownish-purple, ridged and furrowed as they age. Leaves are scale-like, about 1/16 inch long and overlap along the stem. They are often encrusted with salt secretions. From March to September, large numbers of pink to white flowers appear in dense masses on 2-inch long spikes at branch tips.

Saltcedar is fire-adapted and has a long tap root that allows it to intercept deep water tables and interferes with natural aquatic systems. It disrupts the structure and stability of native plant communities and degrades native wildlife habitat by out competing and replacing native plant species, monopolizing limited sources of moisture, and increasing frequency, intensity, and effects of fire and floods.

Saltcedar spreads vegetatively, by adventitious roots or submerged stems, and sexually. Each flower can produce thousands of tiny (1/25-inch diameter) seeds that are contained in a small capsule usually adorned with a tuft of hair that aids in wind dispersal. Seeds can also be dispersed by water. Seedlings require extended periods of soil saturation for establishment. No saltcedar plants have been confirmed in the Kulm WMD to date.

***Spotted knapweed* (Centaurea maculosa)**

Spotted knapweed is a biennial or short-lived perennial, reproducing by seed. Roots are a stout taproot. Stems are erect with slender branches and grow 1 to 3 feet tall. A rosette of leaves is formed the first year, a flower stalk is formed the second year. Basal leaves are up to 6 inches long, with deeply lobed leaflets that are entire and lance-shaped. Stem leaves are deeply divided with entire loves. All leaves are finely hairy. Flowers are pinkish-purple, (rarely white), found mostly on branch tips. Bracts have a comp-like fringe that is black tipped with no terminal spine. Seeds are brownish, notched on one side of the base and tipped with a short tuft of bristles. Plants are very invasive. Spotted knapweed is a native of Eurasia and readily adaptable to a variety of sites.

(Information on Russian olive gleaned from the USDA's invasive species webpage)

***Russian Olive* (Eleagnus angustifolia)**

Russian olive is a shrub or small tree which can grow up to 30 feet tall and is characterized by light green leaves with silvery hairs and olive shaped fruits. The leaves of Russian olive are simple, alternate, lanceolate to oblong, 4-8 cm in length and entire along the leaf margins. This shrub usually flowers in June through July and bears yellow to red olive-shaped fruits which are readily eaten by many species of birds, enhancing dispersal. Russian olive establishes primarily by seed, but vegetative propagation can also occur.

Until recently, Russian olive was highly regarded as an excellent shrub for wildlife plantings and windbreaks. However, this plant has become a major problem invading uplands and riparian woodlands throughout much of the United States and southern Canada. It negatively impacts natural areas by creating dense, monotypic stands that out compete native vegetation, modifying vegetation structure, and displacing native wildlife, as well as altering the hydrology and nutrient cycling within the watershed.
Russian olive is a native of Europe and western Asia. It has become fairly common in the upper Midwest and can be found on a number of WPAs in Kulm's WMD. Control of Russian olive is very labor intensive once the plant has matured past seedling stage.

Site Description

Because the WMD staff manages 201 separate and distinct WPAs throughout a 4- county area, it is not feasible to describe in detail every single site that has a weed infestation, or requires some type of weed control effort. The following is a general description of the WMD and can be applied to virtually every WPA (see attached Kulm WMD WPA map).

Habitat types on WPAs consist of grasslands, wetlands, and occasional "shelter belts" or tree plantings. Grasslands consist of native prairie in varying degrees of health; "go back" grass which is prairie that was once farmed, but has been allowed to return to grass; restored native grassland which was once tilled but has been seeded to native plants; and "DNC" which was tilled land that has been seeded to introduced cool-season plants. Dotted throughout the grasslands are wetlands, also known as "prairie potholes." Temporary and seasonal wetlands tend to be smaller, shallower, and quickly thaw in the spring. They support myriads of aquatic insects, snails and other invertebrates that are rich sources of protein for waterfowl and other marsh birds returning to the prairies to nest. They typically only hold water for a few days to a few weeks. Deeper, more permanent wetlands tend to be larger and thaw later in the spring. These provide habitat for hens and broods later in the summer as well as molting area for flightless birds. It is the combination of the small, shallow wetlands and the large, deep wetlands that makes the Kulm WMD so attractive to waterfowl.

Trees historically existed only along riparian areas and in wooded draws. While few areas on WPAs contain naturally-occurring stands of trees, there are several containing trees that were planted in rows prior to Service acquisition.

Soil types vary from WPA to WPA and from county to county. Below is a list of the top three weed site soils by county and a brief description. Weed sites were classified using the Refuge Lands Geographic Information System (RLGIS) Classification System.

Dickey County:

169 weed sites occurring on 30 different soil types.
Top three soil types include:

Barnes-Svea loams, 3 to 6 percent slopes.

Barnes-Svea loams are deep, undulating soils on till plains. These soils are well drained to moderately well drained with medium runoff. Permeability is moderately slow. These soils have medium to low risk of pesticide leaching.

Barnes-Buse loams, 6 to 9 percent slopes.

Barnes-Buse loams are deep, gently rolling, well drained soils on till plains and moraines. Permeability is moderately slow, while runoff is rapid. These soils have low risk of leaching, but some risk associated with runoff.

Willams-Bowbells-Zahl Association.

The Williams-Bowbells-Zahl association are deep, nearly level to very steep soils. They are well drained to moderately well drained medium textured soils. These soils have medium risk to leaching.

Logan County:

143 weed sites occurring on 31 different soil types.
Top three soil types include:

Buse-Barnes loams, 9 to 15 percent slopes.

The Buse-Barnes loams are fine, loamy soils occurring on till plains and moraines. They are well drained soils with moderately slow permeability. There is little risk associated with pesticide leaching.

Zahl-Williams loams, 9 to 15 percent slopes.

Zahl-Williams loams are fine, loamy soils occurring on knolls and ridges on till plains and moraines. They are well drained soils with moderately slow permeability. There is little risk associated with leaching.

Buse-Barnes loams, 6 to 9 percent slopes.

The Buse-Barnes loams are fine, loamy soils occurring on till plains and moraines. They are well drained soils with moderately slow permeability. There is little risk associated with pesticide leaching.

McIntosh County:

304 weed sites occurring on 48 different soil types.
Top three soil types include:

Zahl-Williams loams, 9 to 15 percent slopes.

Zahl-Williams loams are fine, loamy soils occurring on knolls and ridges on till plains and moraines. They are well drained soils with moderately slow permeability. There is little risk associated with leaching.

Zahl-Williams loams, 6 to 9 percent slopes.

Zahl-Williams loams are fine, loamy soils occurring on knolls and ridges on till plains and moraines. They are well drained soils with moderately slow permeability. There is little risk associated with leaching.

Wabek-Appam sandy loams, 6 to 25 percent slopes.

Wabek-Appam sandy loams are sandy soils occurring on glacial outwash plains. They have a moderately rapid to very rapid permeability and have a drainage class from excessively drained to somewhat excessively drained. These soils have a high risk of leaching.

Lamoure County:
Our GIS database currently does not include soil information for this county. It is scheduled for completion sometime in 2003. Therefore, our analysis is unavailable at this time.

WPAs were purchased with the main objective being, as the name implies, waterfowl production. Therefore, without exception, they contain either one large wetland, several smaller wetlands, or a combination of both. As a result, proximity to surface water for any point on a WPA is never too far. Prudent attention is paid to the labels of all pesticides and they are used accordingly.

Sources of new infestations are difficult to discern, but most likely include seed produced on our own WPAs, seeds produced on neighboring lands where land use practices promote weeds and adequate control in not being conducted, and possibly wildlife species which carry weed seeds and are attracted to the habitats provided by WPAs.

Listed species within the Kulm WMD include; Whooping Crane (Endangered), Bald Eagle (Threatened), Gray Wolf (Threatened), Piping Plover (Threatened) and Piping Plover Critical Habitat. Whooping Crane sightings in the WMD are rare but would occur during spring and fall migrations. Bald Eagle sightings are fairly common in both the fall and spring during migration. Gray Wolf sightings are extremely rare. Piping Plovers do occur within the Kulm WMD. Six areas have been identified as Critical Habitat in the WMD and five of the areas are located on WPAs. The majority of chemical application in the WMD occurs during the months of June, July and August. During this time period the spring migration has past and the fall migration has not started. This should avoid any effect on Whooping Cranes and Bald Eagles. Gray Wolf sightings are extremely rare within the district. If a sighting occurs the information will be documented and the WMD will coordinate with the Bismarck Ecological Services office on further weed control efforts. To avoid impacting Piping Plovers no spraying will occur within 150' of wetlands or within the Piping Plover Critical Habitat (see attached Piping Plover Critical Habitat map).

Monitoring and Mapping

The Kulm WMD is fortunate to be on the verge of completing a multi-year project to map the habitats on each of the 201 WPAs in the District. These habitat maps are the result of on-the-ground reconnaissance, recording features with highly-accurate GPS, and subsequent mapping in ArcView GIS. We will soon have a complete inventory of our habitats and will be able to

classify them based on the *System, Class, and Subclass* definitions prescribed by the National Vegetative Classification Standards (see attached example of Lazy M WPA RLGIS Habitat Classification map).

The habitat classification scheme used by the Kulm WMD takes advantage of a similar scheme developed by the northern North Dakota refuge biologists. Because weeds are a "habitat" of special concern for managers, infestations of leafy spurge, wormwood, Canada thistle, and "other" weeds or undesirable plants are delineated with a minimum mapping unit of 0.25 acres. Noxious weeds not known to exist in the WMD, but prevail nearby such as purple loosestrife and salt cedar would not be subject to a minimum mapping unit standard and would be recorded with GPS if encountered.

The Kulm WMD plans to work towards the practice of *Adaptive Resource Management* (ARM). A necessary component of ARM is the monitoring of management treatment effects, be they haying, grazing, burning, or spraying. Without a biologist on staff, it has been difficult to impossible to accomplish any type of structured monitoring. We've been forced to use anecdotal observations as our "measuring stick." The use of GIS to not only inventory our habitats, but also to map and record our management actions will provide us unprecedented capabilities to implement a sound monitoring program, one which will allow us to finally practice ARM.

Prevention

Preventing the spread of weeds can be the most effective weed control method. Methods used by the Kulm WMD to prevent the spread of weeds include; limiting vehicle access, certified weed free seed, minimizing disturbed areas and education. Motorized vehicles are only allowed on WPAs with a Special Use Permit (SUP) which is issued on a limited basis. The most common SUPs allowing motorized vehicles on WPAs are issued to haying cooperators. Haying is used as a weed control option for wormwood and Canada thistle. Cooperators are asked to clean haying equipment both before and after to reduce the spread of weeds. Occasionally small tame grass areas are broken and re-seeded back to tame or native grass. Certified weed free seed is used during all grass seeding's which is purchased from a reputable dealer. Using certified seed helps prevent the introduction of new weeds to the site. Disturbed areas within the Kulm WMD include small areas where rock or junk piles have been removed. These areas are re-seeded with grass and monitored for required weed control efforts. Monitoring prevents any small weed problem from becoming a large infestation. Education prevention measures include educating both the general public and Kulm WMD staff members. Measures used to educate include; signing biological control areas, documenting weed control efforts and effectiveness, cleaning equipment, and using sound management decisions. By talking with weed boards, neighbors, and all staff members about weed control efforts, better informs everyone on reducing the spread of weeds.

Control Options

Control methods used in the Kulm WMD other than chemical include mechanical, cultural and biological. Haying, mowing and disking are the mechanical methods used most often. Special Use Permits for haying are issued on areas where either a wormwood or Canada thistle problem

exist. These areas are clipped before the noxious weeds have "gone to seed", baled and used for livestock forage. Haying removes the thick duff layer and opens up the canopy to allow preferred grass and legume species to out compete the noxious weeds. In areas where a cooperator is unavailable the WMD will mow force account. This method is not preferred since it is very time consuming and adds additional duff to the WPA. Discing is used on areas where other means of control have not been effective. After Discing the area will either be cropped or fallowed for a period of time to reduce weeds and prepare site for future seeding. A introduced grass and legume mixture called Dense Nesting Cover or a Native grass mixture will then be seeded.

The cultural method most commonly used in the Kulm WMD consists of burning. Prescribed fires stimulate native plant growth and reduce invasive species. At the Kulm WMD burning is most often used to reduce wormwood. A early spring burn or late summer burn approximately six weeks after weed clipping has been shown to dramatically reduce wormwood.

A variety of biological control methods have been, and are currently being used at Kulm WMD. Since 1995, over 6,600,000 flea beetles and stemborers have been released in the WMD to control leafy spurge. Release sites are chosen based on the severity of the infestation and habitat type. Beetles are typically released on large infestation areas and a chemical buffer is sprayed around the leafy spurge using ATVs. The chemical buffer around the release site meets the requirement of the county weed boards and satisfies the local neighbors. Using biological control methods on large areas reduces the pounds of AI applied to the WPAs. Biological control methods have also been used in the WMD for Canada thistle. Over 12,100 stem weevils, seedhead weevils, defoliating beetles and stem gall flys have been released since 1995. These insects have had limited success on the thistle but future releases will be made where feasible.

Strategy

Kulm WMD strategy is to treat every known site of leafy spurge and control infestations of Canada thistle and wormwood. Every large or remote infestation of leafy spurge is treated by releasing biological control agents. Areas are marked using a GPS location and monitored for effectiveness. Areas where biological control agents have disappeared or been ineffective will receive additional releases. Smaller infestations of leafy spurge are controlled using 1 pint of tordon and 1 quart of 2,4-D (Amine 4) mixed with water and applied at a rate of 10 gallons per acre. The chemical solution is applied using ATV mounted sprayers to effectively treat the infestation with the least amount of chemical. Areas infested by Canada thistle or wormwood will be clipped or hayed and receive a chemical application when the regrowth is actively growing. Curtail at a rate of 1-2 quarts/acre or 1 pint of tordon and 1 quart of 2,4-D (Amine 4) will be used to treat Canada thistle. Wormwood will receive 2 quarts of 2,4-D (Amine 4) when the plant is actively growing or approximately 12" tall. After chemical treatment the area will be interseeded with legumes or forbs to increase species diversity. Areas with minor Canada thistle and wormwood infestations will be treated by grazing, burning, haying or mowing. Currently there are no known sites of purple loosestrife, saltcedar or yellow toadflax located on any WPAs. If any sites are discovered they will be eradicated immediately with the appropriate chemical. Russian olive trees will be cut, removed and receive a stump application of Garlon 3A. Russian olive removal will be based on a habitat management decision.

Pesticides

Chemical control is sometimes necessary due to the large district size and when other methods are uneffective. The following Pesticide Use Proposals will be used at the Kulm WMD.

R6-04-62630-01 Roundup Ultra Max for the annual and perennial weeds. This chemical application will be used on WPAs where other control methods have been ineffective and the area is scheduled to be broken and re-seeded. The WPA will be broken and either farmed or left fallow for a period of time. The area will then be seeded with a native grass mix or a Dense Nesting Cover mix. Roundup application will be applied prior to grass seeding to help provide a weed free seed bed. Roundup will also be applied to parking lot areas around the shop to keep the area weed free and esthetically pleasing to the public.

R6-04-62630-02 Tordon 22K/2,4-D (Amine 4) for the control of Canada thistle. This chemical application will be used on areas heavily infested by Canada thistle. Areas will be hayed or mowed prior to thistle "going to seed" and the chemical application will be applied to the regrowth when the thistle is in the rosette stage.

R6-04-62630-03 2,4-D (Amine 4) for the control of absinth wormwood. This chemical application will be used on areas heavily infested by absinth wormwood. Areas will be hayed or mowed prior to wormwood "going to seed" and the chemical application will be applied to the regrowth when the plant is 6" to 8" tall.

R6-04-62630-04 Tordon22K/2,4-D (Amine 4) for the control of leafy spurge. This chemical application will be used on smaller areas of leafy spurge or as a buffer around a biological control release site. Chemical application will be applied prior to the leafy spurge "going to seed".

R6-04-62630-05 Curtail for the control of Canada thistle. This chemical application will be used on areas heavily infested by Canada thistle. Areas will be hayed or mowed prior to thistle "going to seed" and the chemical application will be applied to the regrowth when the thistle is in the rosette stage.

R6-04-62630-06 Plateau for the control of leafy spurge. This chemical application will be used on smaller areas of leafy spurge. Chemical application will be applied in late summer or fall.

R6-04-62630-07 Garlon 3A for a stump application for Russian olive. This chemical application will be used on stumps of Russian olive after the tree has been cut using a chain saw. Chemical will be brushed onto the stump.

Application, Methods, Timing and Best Management Practices (BMPs)

Our preferred method of controlling pest plant species is to adopt sound land management practices. Properly managed grasslands support healthy native plant species which will out compete invasive pest species. Land management practices employed by District staff include

grazing, haying, burning, mowing, farming, and finally spraying. The WMD applies some form of management to approximately 20% to 25% of the uplands each year. By actively managing the WPAs the district believes invasive pest species are controlled without relying on chemical application.

Grazing is accomplished by cooperators through the issuance of Special Use Permits. One objective of grazing is to remove and "hurt" introduced cool season grasses such as Kentucky bluegrass and smooth brome. When this is the objective, grazing is commenced as early in the spring as possible (late March, April) when the introduced cool season plants are actively growing. Stocking rates are heavy (1.0 to 1.5 AUMs/acre) and duration short (less than 21 days). We prefer to use more livestock and shorter grazing periods; however, cooperator herd size is often limiting. The resultant clearing of dense mats of these plants promotes the growth of cool and warm season native plants. The frequency of this treatment is not more than once every three years.

An alternative objective of grazing is to stimulate the "fast nutrient cycle" causing a release of nitrogen from the native plant roots which leads to a flurry of microbial activity in the rhizosphere. This activity leads to increased breakdown of other nitrogen in the soil that was previously unavailable for plant use. Ultimately, plants use this "old" and "new" nitrogen to regrow more leaves than they would have without grazing. Grazing with this objective occurs from June 1 - July 15. Stocking rates are reduced to around 0.5 AUMs/acre. This grazing regime can be used in successive years; a rotation among 2-3 pastures is usually used with rest being worked in every third year (graze 2-3 years, rest a year).

The second strategy (light grazing, successive years) has been most successful at encouraging healthy native plants while suppressing noxious weeds.

Haying is another tool used to manage grasslands. The main objective of haying is to remove woody vegetation and prevent noxious weeds from going to seed. Combined with raking, haying also removes the duff layer to allow regrowth of preferred grass species. Again, healthy stands of grass are the best defense against invasion by noxious weeds. Haying is accomplished after July 15 to minimize the impact to ground nesting birds, and before September 1 to allow regrowth before winter and provide residual nesting cover. Other haying activities such as baling and removal of bales is also completed by September 1. This minimizes disturbance to wildlife, eliminate bales during the hunting season and reduce the chance of killing desirable vegetation under the stacks. Occasionally, haying prior to July 15th is authorized to prevent noxious weed seed development, especially in new grass seeding's where grasses are not yet established.

Burning is periodically used in the District to remove decadent vegetation, usually in grasslands dominated by Kentucky bluegrass and smooth brome. It is also used in areas containing leafy spurge infestations and where we are employing biological control with flea beetles. Evidence indicates that flea beetles respond favorably after a burn, presumably because the reduction of "duff" causes the ground to warm up faster, leading to earlier emergence by the beetles. Also, the removal of the duff causes the beetles to lay their eggs deeper in the soil, thereby preventing them from freezing out in the winter. A spring burn or late summer burn has also shown to dramatically reduce wormwood plants.

Six areas have been identified as Piping Plover Critical Habitat in the WMD and five of the areas are located on WPAs. To avoid impacting Piping Plovers and their Critical Habitat no spraying will occur within 150 of wetlands and no chemicals will be applied in the Piping Plovers Critical Habitat area.

Chemicals will be applied at least 150 feet from water with groundwater $\geq$ 10 feet from the surface. No spraying will take place on slopes in excess of 10% which drain towards wetlands. Caution will be used to avoid drift onto sensitive crops and label directions will be strictly followed. If a situation arises where chemical weed control is needed adjacent to surface water or groundwater $\leq$ 10 feet a additional PUP will be written for an aquatic herbicide.

When chemical treatment is required the Kulm WMD applies the chemical in a safe and conservative manner. The majority of chemical application is applied using ATV mounted sprayers. ATV sprayers allow the WMD to effectively treat the infestation with the least amount of chemical, thus reducing the pounds of AI applied. Each sprayer is equipped with a digital meter to record gallons applied which is calibrated prior to the spray season. Gallons applied is then recorded with a variety of other information to comply with State record keeping requirements. Each applicator wears a tyvex suit, respirator, rubber gloves and boots during all spraying operations. Chemicals applied using the truck mounted sprayer occur on areas of solid infestations or areas to be re-seeded. To reduce the pounds of AI, the truck is equipped with a state-of-the-art computer based spray controller to eliminate operator error. After broad cast spraying the area will be re-seeded to grass or interseeded with legumes or forbs. Extreme caution is used around wetlands.

Restoration

Habitat restoration is required when treatments such as biological, cultural and mechanical are ineffective, and chemical application is not acceptable. Under these circumstances weed infested areas will be broken and left fallow or cropped for a period of time. If the area is left fallow Discing will occur as needed during the growing season to control unwanted vegetation. The seed bed will be prepared by packing the soil or possibly spraying with round-up prior to seeding, depending on grass mixture. Grass mixtures may include deep-rooted perennial forbs to help reduce soil resources for weedy deep rooted perennials such as leafy spurge and Canada thistle. After seeding, the area will be clipped for a period of time until the grass planting has out competed the weeds. Clipping will either be done by force account or by Special Use Permit using a local cooperator.

Record-Keeping

When chemicals are applied within the Kulm WMD a North Dakota State approved Chemical Application Record is completed. The record consists of gallons applied, wind speed, target species, and a variety of other information to comply with State record keeping requirements. A copy of the form is included in the attachments. The Chemical Application Record is completed on-site, and is filled out by the chemical applicator. All recorded information is transferred into ArcView GIS and stored by calendar year. This information is available to each staff member at the Kulm WMD.

Outreach

Kulm personnel have been involved in many outreach efforts within the WMD. District managers have attended weed board meetings, weed board field days, met with neighboring landowners on weed issues, and worked on Challenge Cost-Share Grants with county weed boards. When a WPA is identified as a potential biological control release site, a WMD staff member contacts the local weed board and the neighbors to solicit support for the release. The release sites are marked using GPS and monitored for their effectiveness. The WPA boundary is also signed with a "Biological Control Agent" sign to notify the general public. Kulm WMD has also allowed collection of leafy spurge flea beetles on WPAs by county weed boards, local landowners and other FWS stations where possible.

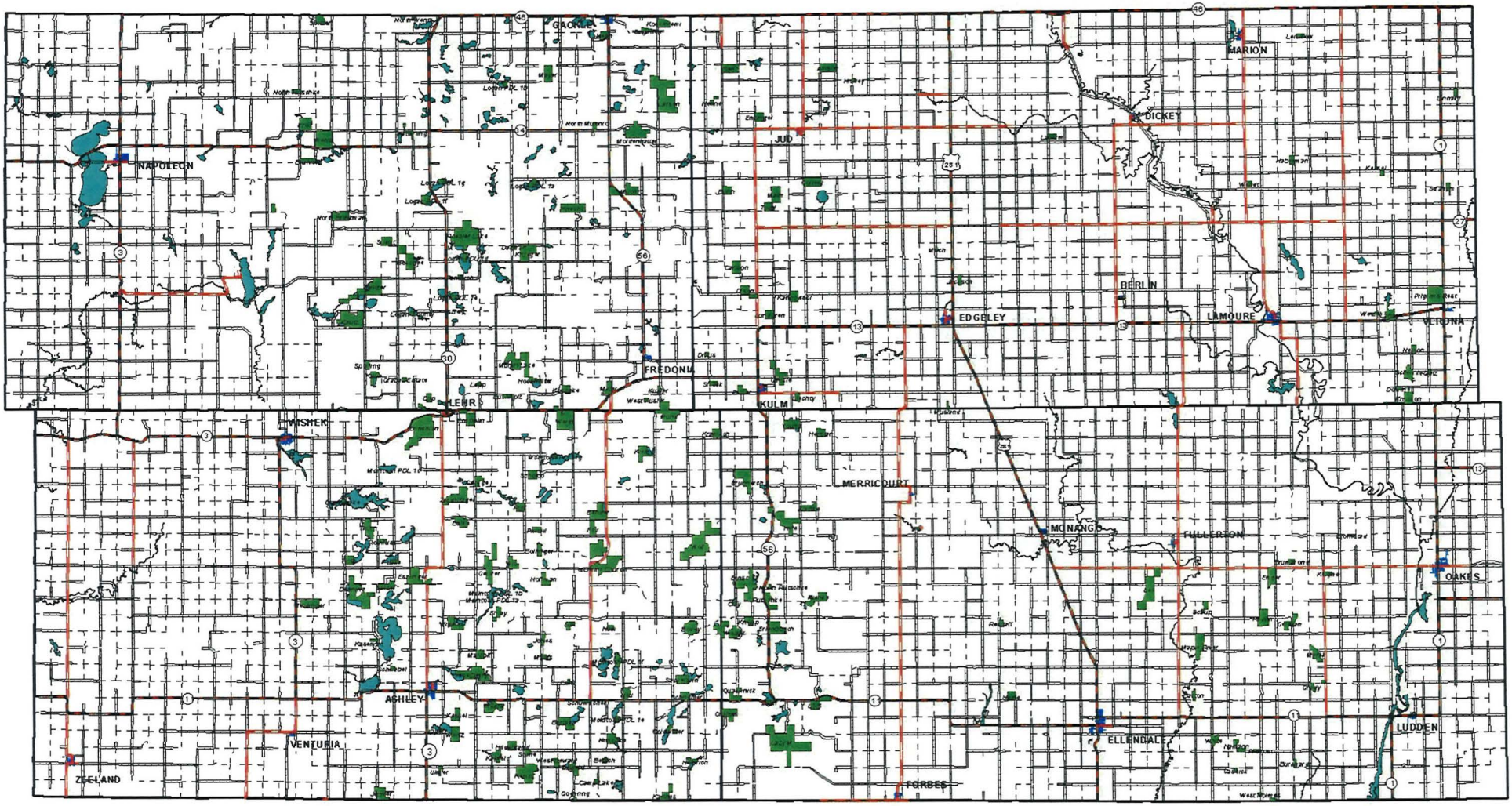
Combined with outreach, the Kulm WMD sends each staff member who applies chemical, or supervises someone who does, to pesticide training. This training, administered by the state of North Dakota, is usually a two or three day program dealing with all aspects of chemical application. A exam is given at the end of the program and the employee will receive their Commercial Applicator's license upon successful completion. Currently Kulm WMD has six employees with current Commercial Applicator's license.

Entry restrictions on non-cropland for chemicals applied at Kulm WMD state; do not enter or allow worker entry into treated areas until sprays have dried, unless applicator and other handler PPE is worn. Almost all of the chemicals applied in the Kulm WMD are applied to non-cropped areas. Each applicator wears a tyvex suit, respirator, rubber gloves and boots during all spraying operations. Persons not wearing PPE will not be present during spraying operations. In most cases the spray will have dried before the applicators have loaded the equipment and left the WPA. If a member of the public arrives during spraying operations, applicators will immediately quit spraying and inform the person of the chemical applied and the purpose. Any cropland sprayed will be posted with chemical applied, time, date and re-entry period.

Chemical applicators and their supervisors are required to review the Kulm WMD IPM Plan, PUPs , pesticide labels, and MSDSs each field season. A copy of each document is kept in the office and out at the shop. Additional copies of the pesticide labels and MSDSs are kept in the chemical storage building located adjacent to the shop. Each staff member is aware of, and has access to each of these documents.

Attachments:

Kulm WMD WPA map
Piping Plover Critical Habitat map
Lazy M RLGIS Habitat Classification map
Kulm WMD Chemical Application Record



WPA Boundary
Major highways
Paved roads
Gravel roads
Trails
Unimproved
City streets
County Boundaries
Lakes and Rivers

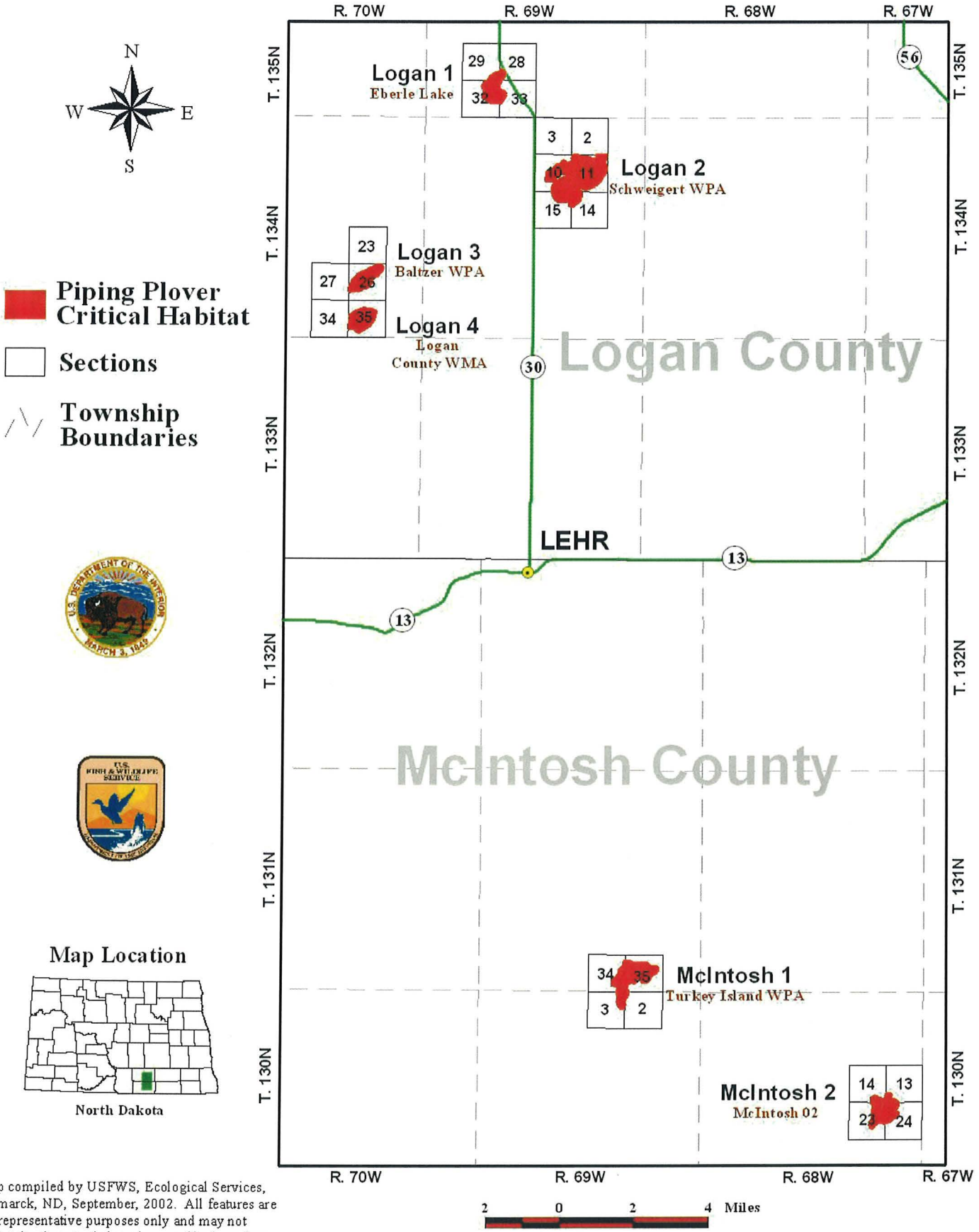
10 0 10 20 Miles

Kulm Wetland Management District

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

Piping Plover Critical Habitat

Unit 9 (North Dakota)



Map compiled by USFWS, Ecological Services, Bismarck, ND, September, 2002. All features are for representative purposes only and may not depict the the actual size, shape and/or boundary.