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Restoring a Prairie-Wetland Mosaic at Crex Meadows

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INTRODUCTION

Crex Meadows Wildlife Area(CMWA) is located in western Burnett County, in northwestern Wisconsin. Part of the Glacial Lake Grantsburg Wildlife Management Complex, CMWA is 30,097 acres, the second largest state-owned wildlife area in Wisconsin. The many different habitats support a wide diversity of flora and fauna. CMWA is composed of lakes, wetlands and upland brush-prairies. The different ecosystems support a wide variety of wildlife, with wetlands having the most visible and abundant selection of species. Among the birds that use this area are many different types of waterfowl, herons, bald eagles, ospreys, sandhill cranes, great blue herons, rails, wrens, and sandpipers. Mammals, amphibians, and reptiles live in these waters as well. The brush-prairies, also called pine barrens or jack pine-scrub oak savanna, include vegetation such as jack and pines and Hill's oak. These trees are scattered among prairie grasses, sweet fern and hazel. Brush-prairies are managed to support sharp-tailed grouse and prairie chicken populations. They are home to badgers, pocket gophers, coyotes, meadowlarks, and upland sandpipers. Raptors common to this area include red-tailed hawks, rough-legged hawks and kestrels. The forests contain tree species such as scrub oak, jack pine, and aspen. Populations of deer, bears, gray squirrels, snowshoe hares, bobcats, owls, woodpeckers, and many songbirds live in these woods. A wolf pack has also inhabited the area recently.

HISTORY

Native Americans, mainly the Fox, Dakota, and Chippewa people, used the area to hunt ducks, geese, and sandhill cranes; cranberries and blueberries were also harvested. The first settlers arrived in the 1700's, with most settlement occurring in the mid-1800's. Around 1890, the settlers partially drained the shallow sedge marshes and attempted to farm the land. This drainage caused a change in the ecology of the area from a cyclic emergent/sedge marsh to a sedge marsh. The marsh hay was harvested. The settlers attempted to farm the land, but this proved futile. The sandy soils in the area were not fertile and farms were abandoned. The Crex Carpet Company bought the area in 1912 and harvested the marsh grass, Carex stricta. The grass was sent to St. Paul to manufacture grass rugs. The company went bankrupt in the 1930's due to the development of linoleum and ecological changes on the marsh. Agriculture was again tried, but by 1940, most of the property was tax delinquent. In the pine barrens, yearly fires swept through the dried leaf and plant litter, keeping the overstory fairly open. These fires were controlled after settlement and the trees grew together, creating closed forests.

INTERVENTION

H. Riegal, a man with influence, was a major instigator in the acquisition of Crex Meadows (Berquist, Bob and Trish, 1996). He grew up and hunted in the area. He wanted the land set aside for re-establishment of the wetlands for waterfowl and to bring back the brush-prairies, which were gradually being taken over by trees and shrubs. After the area was drained, there was a decrease in waterfowl numbers, but as a result of the land becoming drier, the populations of prairie chickens and sharp-tailed grouse increased. As the woods grew thicker, the prairie chicken and sharp-tailed grouse habitat deteriorated. H. Riegal hoped that once this area was restored, it would then be a better place for hunting. In 1945, the first several thousand acres were purchased by the state and Crex Meadows was created.

HYDROLOGY

When CMWA was founded, most of the wetlands had been partially drained. To bring the marshes back to presettlement conditions, property manager Norm Stone began building dikes. Federal funding for the development of an extensive dike system began in 1950 and has continued to this date. There are now over 18 miles of dikes. The construction of the dikes has resulted in over 4,100 acres of open water and 4,000 acres of marsh. ditches, water control structures and a diversion pump were also installed. The water pump can pump over 10,000 gallons per minute and is used to regulate water levels in the marshes and lakes.

VEGETATION

Stone's purpose in opening up the woody areas was to increase the brush habitat where the prairie chickens and sharp-tailed grouse thrived . John T. Curtis described the process in The Vegetation of Wisconsin:

> ... the initial burn was made in 1952. Wet weather prevented further fires until the spring of 1956. An examination of the land in the fall of 1956 revealed an amazing development of prairie, after only two fires. The ground was dominated by prairie grasses, especially big and little bluestems and Indiangrass. Altogether, 54 species of prairie plants were found on the area, including such heavy seeded species as lupine (*Lupinus perennis*), and redroot (*Ceanothus ovatus*). (p.304)

In the spring of 1957, there was a hot crown fire which destroyed the tops of all the trees. In July of that year, examination of the area revealed over seventy different prairie species, including prairie onion, leadplant, and prairie birdfoot violet.

The CMWA wetlands were dominated by *Carex stricta*, a sedge, and *Calamagrostis canadensis*, bluejoint grass, when it was purchased. These areas were also being taken over by woody species. Increased flowage construction and repeated burnings reversed this trend and now most of the sedge meadows range from shallow emergent marshes to shallow, open water. Species composition has also changed to include cattails, burreed, pickerel weed, pondweeds, bulrush,

bladderwort, water lily, and arrowheads (CMWA Master Plan, 1982). Flowage development continues with the hope of increasing the populations of the existing flora and fauna.

WILDLIFE

The 1950's brought about the reintroduction of Canada geese. With the water levels as high or higher than they were originally, the geese did well. Initially, they were penned, with their wings clipped. They were eventually released into the wild and allowed to nest. At first, they were protected, but as their numbers grew, people were permitted to hunt them. (Berquist, Bob and Trish, 1996). Not only did the geese flourish, but so did the mallards, blue-winged teals, and other waterfowl. Muskrat, beaver, mink, otter, and sandhill crane populations also grew as a result of the dikes. Bald eagle and osprey nesting platforms were erected on the lakes and there are now nesting birds of both species every year. Gadwalls and prairie chickens were also reintroduced.

MANAGEMENT

CMWA is managed by seven permanent full-time employees, including an interpretive wildlife manager, a property manager, a mechanic, and four wildlife technicians. There are numerous volunteers who staff the interpretive center on the weekends. Near the interpretive center, there is a Youth Conservation Camp that has been in existence since 1964. The young adults at the camp assist in goose banding, facilities maintenance, habitat management, and surveys. Crex Meadows is 85% funded through hunting license fees and Pittman-Robertson funds. The Pittman-Robertson funds originate from a 11% excise tax placed on all hunting equipment sold nationwide. Water control includes the management of the diversion pump and water ditches. The North Fork Flowage provides water for many other watersheds on the property. The watersheds that are at a higher altitude benefit from the North Fork Flowage. Water is pumped to these watersheds as needed, usually when runoff from the uplands bypass them. Management of the brush-prairies continues with controlled burns. Since the initial burn in 1952, there have been fifty-five miles of firebreaks constructed to facilitate prescribed burns. Burnings take place every two to five years on parcels of land that range in size from fifteen to one thousand acres. Management of the CMWA includes plans to convert much of the forest that is left back into brush-prairie are . Burnings and clearing will achieve this. The clearing of the area will be done by commercial logging companies. Increasing the size of the brush-prairie will hopefully increase the populations of prairie chickens and sharp-tailed grouse.

A 2,300 acre wildlife refuge is located in the center of CMWA. It includes some flowages and 260 acres of farmed land. Corn, millet, rye and buckwheat are grown here to provide food for resident and migrant wildlife. Sandhill cranes, prairie chickens, geese, and deer take advantage of this food source, both during the growing season and winter. The food provided keeps waterfowl in the area into hunting season and the deer trails to and from the fields provide excellent

opportunities for bow hunters. Since it is not known whether discontinuing the use of crops as a food source would affect the populations of the animals that use the field, future plans include the continuation of this practice.

Fish are also a management concern at CMWA. Because nesting ospreys and bald eagles use them as a food source, populations of these aquatic animals are carefully monitored. Fish in the shallow, open waters include mud- and fathead minnows, bullheads and sticklebacks. Because of the nesting species in the area and the shallowness of the flowages, sports-fishing is not allowed. Minnows are seined yearly by both the Spooner Warmwater Hatchery and commercial groups.

DISCUSSION

The burns that took place in the 1950's were very experimental. Norm Stone had no idea what would happen. He had no idea that the seed source was in the soil and would benefit from the decrease in shade and the intense heat of the fire. Curtis states in The Vegetation of Wisconsin that "the exact mechanism responsible for this dramatic reappearance of the prairie remains in doubt " (p.304). Over 212 plant species currently populate Crex Meadows, none planted. Plants that had occurred on these lands prior to disturbance are again growing in the area. The plant list assesses the progress of the burns and keeps expanding to include new species.

The hydrology of the area had been altered drastically by draining that dikes were necessary to maintain water levels. Originally there were no shallow, open water areas, now there are over 4,100 acres of this habitat. The marshes are flooded to maintain certain water levels and the edges of the wetlands are cleared to keep these areas open for nesting waterfowl. These waters support over 20,000 birds during nesting and migration periods, but would they continue to do so if this area was less intensely managed. Crex Meadows has become a valuable asset to the Mississippi flyway and has enhanced waterfowl production.

Originally, the land at Crex was maintained to increase populations of animals for hunting. Many of these animals fed from the crops that were planted in the wildlife refuge. Today, the crops are still planted, not only to maintain the populations for hunting, but to also provide food and shelter for migratory birds. The levels at which these animals are being maintained could possibly be higher than what the land could naturally support. It would be difficult to take away this source of food and find out that the populations would decrease significantly.

Crex Meadows is being maintained today with the same techniques that were used in the 1950's. The management provided food and shelter for animals that were both existing and reintroduced. It also reopened areas for savannas and reestablished wetlands. It may be time to take a step back, look at the restoration, and determine whether this restoration was a success. In order to do this, a few questions need to be answered: What was there before the land was altered? Did it provide for this many animals? Are there flora and fauna missing that was there before? What could they do to bring it back? Are all the plant and animal species indigenous to the area?

The Crex Meadows Management Plan (1982) includes annual objectives.

Production of ducks, goslings, and sharp-tailed grouse are just a few of these objectives. What seems to be missing are assessment monitoring techniques. The plant list that they maintain may be one way of keeping track of the success of Crex Meadows. Once certain desirable and less common plants are found at CMWA, this could indicate that Crex had reached a certain threshold. Another way to assess the accomplishment of long-term goals is to monitor the change of wildlife in the area. Over time the animal populations have changed, with new animals moving into Crex. These animals, including the more recent populations of badgers and wolves, are a visible sign that Crex Meadows has changed. Success can also be monitored by the number of nesting birds that use the area. These numbers are already closely watched. All that needs to be done is to try to compare this with an area that is pristine. Are the numbers similar?

Crex Meadows is a wonderful place to use for people with a wide range of interests. It offers bird watching, hunting, picnic areas, prairies in bloom, and the opportunity to understand more about wildlife. It has been a long-term restoration project with plans to expand in the future. It is a good place to use for comparison with other projects of a similar nature.

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