

Wetland Wildlife Management

Habitat Extension Bulletin

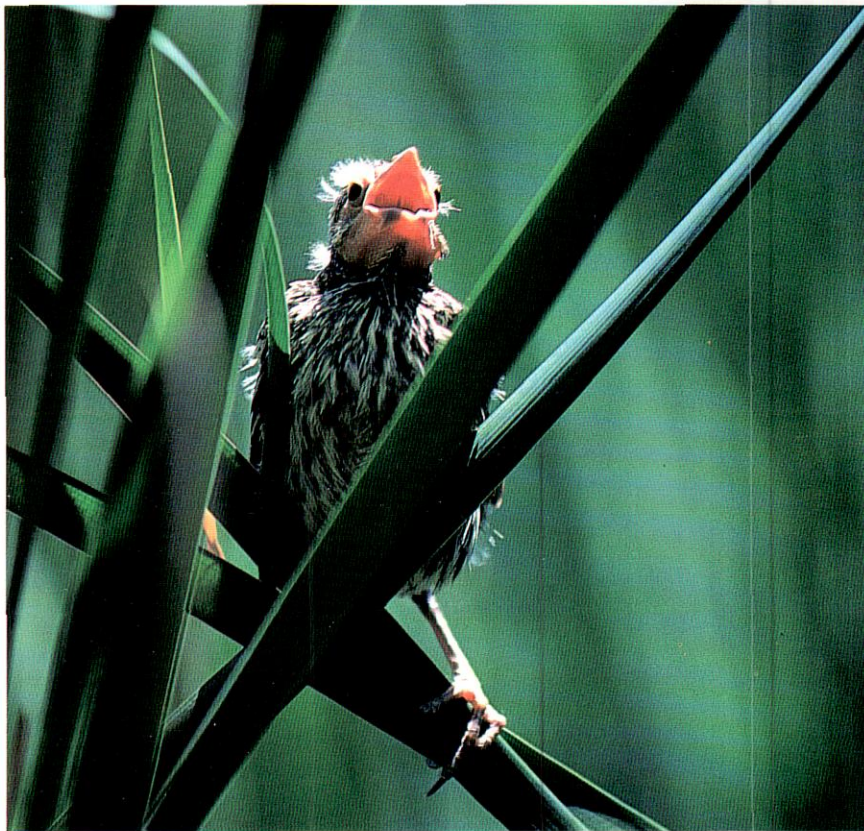
No. 8

It is ironic that wetland habitats are disappearing at a faster rate than any other type of wildlife habitat. Ironic in that these special habitats support the greatest diversity of wildlife of any known terrestrial habitat type. Wetland loss in the last 100 years has been dramatic; over 50 percent of all wetlands in the United States have

prevalent attitude regarding wetlands is that they are worthless mosquito-infested areas. "Worthless" perhaps from an agricultural or developmental standpoint but priceless in terms of wildlife richness and diversity.

While wetlands are often thought of as dabbling duck habitats, they actually meet the

This blackbird nestling is one of hundreds of bird species that routinely use wetlands.



been destroyed by man. This percentage is probably less in Wyoming because of the overall absence of wetlands in the state, but the trend remains the same.

Much of the wetland destruction that has occurred has resulted from misunderstanding and ignorance about these unique habitats. A

needs of a variety of wildlife species and, as such, should be rigorously protected. Big game species such as mule and white-tailed deer use wetland areas as sources of food and water and utilize edge cover provided by wetland areas for security and shelter. Depending on their size and available cover, wetlands may provide

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Muskrats are an important part of wetland ecology, controlling the spread of cattails and other emergent plants and helping maintain some open water in the marsh. Spring run-off (below) is important in maintaining marshes of all types. Wetlands are not only rich in animal life but support a wide variety of plants, such as this pickerel weed, as well.



nesting, escape, and winter cover, as well as food resources for a number of mammal, bird, fish, and amphibian wildlife species.

Wetland Structure

Characteristically, different types and species of aquatic plants are found at varying water depths in and around a wetland area. Plant species which inhabit wetland areas can be categorized under three broad headings: wet-meadow species, submergents, and emergents. Wet-meadow species such as sedges are found immediately adjacent to the wetland. Submergent plants are normally rooted in the water basin substrate and remain below water level throughout their existence. Sago pondweed is an example of a submergent species. Emergent plants also have their root stocks in the basin substrate but send a stalk or shoot above the water surface. The cattail is an example of an emergent species. As a rule, floating leaf plants such as the lily pad are found in the deepest waters of wetlands followed by submergent species, tall and short emergent plants, and finally sedges and water-tolerant shrubs and trees along the shoreline. Water depth variabil-

ity and shallow sloping shorelines should be encouraged, as they lead to plant diversity, which, in turn, influences the use of the wetland by numerous wildlife species.

Because most wildlife species use specific portions of a wetland, a change in the vegetation structure dramatically affects which species of wildlife will continue to use the area. Changing water depth has the most dramatic effect on plant production and growth. This production and growth, in turn, affects the production of aquatic invertebrates which serve as a source of food for a variety of fish, amphibian, waterfowl, and mammal species.

In addition to water depth, muskrat and beaver activity in a wetland area can dramatically affect plant production, distribution, and density. As these herbivores increase in number, large expanses of plants can be "eaten out," with the cut plant materials eaten directly or used as lodge-building materials. While a certain amount of open water is desirable, too much open water can lead to homogenous wildlife habitat, and ultimately, to reduced species richness in the wetland environment. As an example, bird species will often move into

wetland areas and quickly determine if food resources in the area are adequate. If they are not, the birds will move to other areas.

In Wyoming, muskrat populations are rarely high enough to eat out a wetland and, in fact, can be very effective at controlling the amount of emergent vegetation present. However, monitoring the muskrat population is advised. The ability of muskrat populations to "explode" and quickly overrun an area is not to be ignored. A female muskrat may have four litters each year, with six or more young in each litter. As the population increases, vegetation can be rapidly removed from a wetland.

The most dramatic plant removal occurs in the summer months, during the period of lodge construction. The size of the lodges built is a good indication of the muskrat population in the area. When muskrat numbers are low, lodges will be large, six feet high and 15 feet in diameter. Lodges will be half this size as muskrat numbers increase and building materials are at a premium. As muskrat numbers climb, reproduction will decrease, but the present population may remove more vegetation than desired. Trapping is an effective management tool for controlling muskrat numbers and for maintaining the wetland in a desirable condition.

A more difficult management problem is the presence of carp in a wetland system. Carp uproot vegetation, compete with other wildlife for food, and continually create turbid water conditions. Unfortunately, control of these fish species is much more difficult than is muskrat control. Complete drawdown or chemical poisoning of the wetland are the only effective ways of eliminating carp populations. And if the wetland area is one in a series of linked water sources, re-introduction of carp to the treated area is likely.

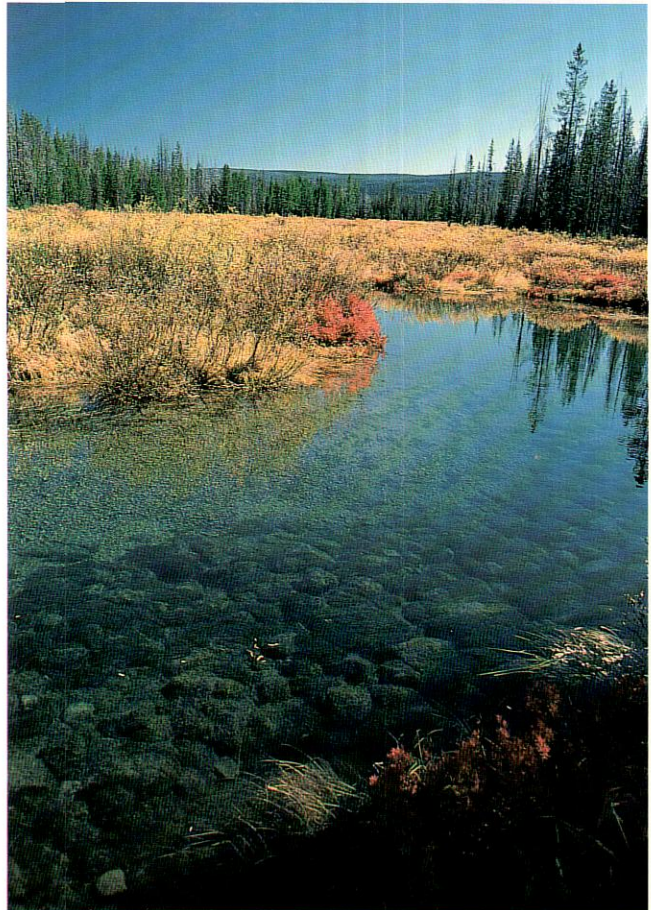
Management Actions

While management of wetlands is possible, and in some cases desirable, it is not always necessary. Protection itself is a form of management and, in some cases, may be the only management action necessary. In developing wetland areas for wildlife, it is important to remember that too much management is as bad as or worse than no management at all.

Note that a wetland is normally not an isolated "island" of habitat but rather interconnected with other wetland habitats. Manipulation of one of these habitats influences all others in the immediate area. Thus, management decisions should be carefully considered before being implemented. And while a person may wish to manage a wetland for a specific wildlife species, ultimately the best strategy is to manage for a wide variety of wildlife species by maintaining habitat diversity. The benefits to wildlife in general will be more far-reaching with this "sys-

tem" management approach than with management for a single species. Where several wetlands occur in proximity to one another, they should be managed in staggered cycles, thus providing maximum diversity over the entire wetland complex.

There are several techniques for management of wetlands that can be effectively implemented. Livestock should be fenced out of the wetland to avoid destruction of aquatic vegetation, increased water turbidity, and pollution of the system. Livestock can also destroy vegetation covering earthen retaining walls and dams, eventually leading to washout of these structures. Ideally, a 100-foot perimeter fence should be constructed around the wetland. If livestock is dependent on the wetland area as a water



Wet meadows and drainages at higher altitudes in the Wyoming high country support many of the state's rare wildlife species, including the trumpeter swan, harlequin duck, and common loon.

source, a pipeline should be constructed from the wetland area to a stock tank. If this option is not feasible, a "water gap" can be constructed. This involves constructing a fence into a small portion of the wetland, with livestock allowed to

use this restricted area for watering.

A landowner may wish to consider planting a 40- to 100-foot buffer strip of tall herbaceous cover and food types adjacent to the wetland to provide food and critical nesting, escape, and winter cover for a number of wildlife species. Studies indicate that a buffer strip of habitat surrounding a wetland greatly increases the ability of the wetland to support wildlife numbers. One study found that 4.5 times as many pheasants and 2.4 times as many ducks were produced on or around wetlands which contained large areas of nesting cover along the water's edge. And while a buffer strip will serve to increase nesting potential for a number of wildlife species, it will also serve to improve wetland water quality by trapping silt and contaminants before they reach the water's edge as well as to increase the life expectancy of the wetland by reducing sediment loading.

There are several different techniques for managing the wetland proper, and all of them can be categorized under two headings: biological and mechanical. Biological techniques are the cheapest and most lasting and include water level management and control of herbivores. Artificial techniques include bulldozers, blasting, and ditching equipment. In general, artificial methods are more costly, less aesthetically pleasing, and less likely to produce typical wetland communities. Because of these drawbacks, these techniques will not be covered in this bulletin.

Initially, the landowner should assess the condition of the wetland before implementing any management strategy. In general, a wetland habitat with a combination of open water and vegetated areas will be most beneficial to wildlife. Too much or too little open water will result in a select few species utilizing the area, as opposed to a great many species utilizing an area with a combination of these habitat types. A ratio of 30 to 40 percent cover to 60 to 70 percent open water is recommended. A series of management steps will lead the landowner to this desirable ratio, though it may take a few seasons before this ratio is realized.

As stated earlier, water level manipulation has the greatest effect on the wetland. Many natural wetlands lack a stable water level from year to year and even from season to season, and managed wetlands should mimic this situation. Stabilization of water at high levels is undesirable, as it leads to lake-like conditions promoting the growth of aquatic vegetation instead of semi-aquatic vegetation. At low levels, wetlands become too densely grown over, and resemble terrestrial rather than aquatic systems. Both of these conditions lead to a lack of productivity and thus a lack of wildlife species diversity.

And while stabilization of wetland water levels is not recommended, neither are random fluctua-

tuations of the water level advised. Such fluctuations can cause more harm than good to the wildlife utilizing the wetland area. Water level manipulation should be carefully conducted at the proper time of the year to insure maximum wildlife benefits. For instance, water stability, though not desirable throughout the year, is imperative during the spring bird nesting season.

In some instances, landowners may not have the ability to manipulate wetland water levels due to a lack of water control devices. If this is the case, the installation of such devices should be considered. Without some means of manipulating wetland water levels, practical management options for the wetland will be severely reduced.



The practice of lowering water levels permits nutrient cycling, the germination of naturally occurring seed, and the recovery of established emergent and submergent vegetation. In the past, seeds of desirable plant species were often planted once drawdown was complete. However, natural seed sources remain viable for years, and these natural supplies are usually adequate to repopulate a wetland area. If the wetland is



The rich wildlife bestiary supported by marshes includes (clockwise from top): the raccoon, river otter, yellow-headed blackbird, Canada goose, and mallard.

known to have been devoid of vegetation for a considerable period, planting may need to be considered as an option. Native seed should be obtained and used. At all costs, the introduction of exotic plants, either intentionally or unintentionally, should be avoided.

Water level regulation is divided into two categories: complete and partial. Complete drawdown is necessary when major vegetative

restoration is needed in an open-water wetland and/or when herbivore (muskrat or beaver) numbers must be reduced. Complete drawdown procedures will also effectively eliminate carp populations from a wetland. A partial drawdown is used when vegetation growth needs to be encouraged, or herbivores need to be discouraged.

Complete Drawdown Procedures

While the degree of complete drawdown is variable, ideal practices result in the cracking of bottom muds and the decomposition of bottom vegetation. The length of drawdown is variable as well, but the basin soil should be allowed to dry and release its nutrients before re-flooding is initiated. This process may take the greater part of the growing season. A second option is to conduct the drawdown during the winter months; the area can then be re-flooded in the late summer months to avoid impacting duck hunting opportunities. These drought conditions will all but eliminate muskrat populations, but muskrats should quickly return to an area once conditions improve.

Note that, with a complete drawdown, wildlife species will not utilize the area as before. In a situation where a wetland must be rejuvenated, immediate wildlife needs will have to be deferred, and the wetland allowed to recover. Once recovery is complete, however, the benefits to wildlife will be long lasting and thus worth the one to three seasons of less desirable conditions.

Re-flooding should be a natural, and thus, a slow process. Among other negative effects, rapid re-flooding of an area can cause plant mortality due to increased turbidity of the water and lack of sunlight penetration. Late summer flooding to freeze-proof depths may induce muskrats to return to an area. Keeping water levels low will attract shorebirds and dabbling ducks but will not attract muskrats.

Water levels should be regulated mainly for vegetation growth, diversity, and survival during the second (first re-flooded) season. Stable and/or high water levels can result in a decline of desirable emergent vegetation, and another complete drawdown may be necessary to establish good stands of emergents. In subsequent years, wetland management will continue to revolve around the ratio of vegetation to open water. Muskrat numbers will have to be regulated by trapping to maintain this ratio, and wildlife should prosper. Moderate drawdowns in following years will encourage submergent vegetation and maintain most stands of emergent vegetation. Gradually, however, emergent vegetation will die out, and a complete drawdown will again be necessary.

A word of caution regarding total drawdown procedures: The drawdown of wetlands associated with shallow ponds can lead to the establishment of emergents (such as cattails) in undesirable locations.

Partial drawdown procedures

If a partial drawdown is deemed necessary, water levels should be reduced to shallow depths

which will encourage both emergent and submergent plant species to germinate. As with complete drawdowns, wildlife use of the area will lessen, though not as dramatically as with a complete drawdown. These drawdowns should be conducted in early spring prior to bird territory establishment, or in fall, prior to muskrats lodging for the winter. Shallow water depths will discourage species preferring deep water such as diving ducks and muskrats. However, use by shallow water species such as shorebirds and dabbling ducks *should increase*.

In late summer, the water depth should be stabilized or lowered if desirable shallow depths have not been accomplished. The water level should then be slowly raised so as to reach near-normal levels by early fall.

Over-winter water levels should be based on desired results for the wetland. If vegetation densities are high, freeze-proof depths are recommended to encourage muskrat use of the wetland. If vegetation densities remain lower than desired, then water depths should remain below freeze-proof depths to discourage muskrat use of the area.

Low water levels should be maintained for several more seasons to encourage the growth of perennial emergents such as cattails. Once vegetation densities are deemed sufficient, water levels need to be regulated to maintain desired ratios of vegetation to open water. Remember that high populations of muskrats can be controlled quite effectively through trapping. This management action may substitute for partial drawdown procedures, if high muskrat numbers are considered to be the problem.

Conclusion

If properly managed, a wetland can be a rich source of wildlife diversity. Hunting opportunities can be dramatically improved, and the opportunity to view and enjoy a multitude of wildlife species realized. For additional information, help in assessing the condition of your wetland(s), or assistance in developing a management plan, contact your local Game and Fish and/or Soil Conservation Service representative. Protect and enjoy your wetland habitats.

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This publication is one in a series of habitat extension bulletins produced by the Wyoming Game and Fish Department. Call 1-800-842-1934 for additional information or assistance.

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