

Dabbling Ducks

Maryland is extremely important to migratory waterfowl populations. Dominated by the Chesapeake Bay and adjoining wetlands, Maryland provides prime wintering habitat for waterfowl. A large waterfowl population has made Maryland famous for its tradition of waterfowling, from the market hunting of yesteryear to the extensive recreational hunting of today.

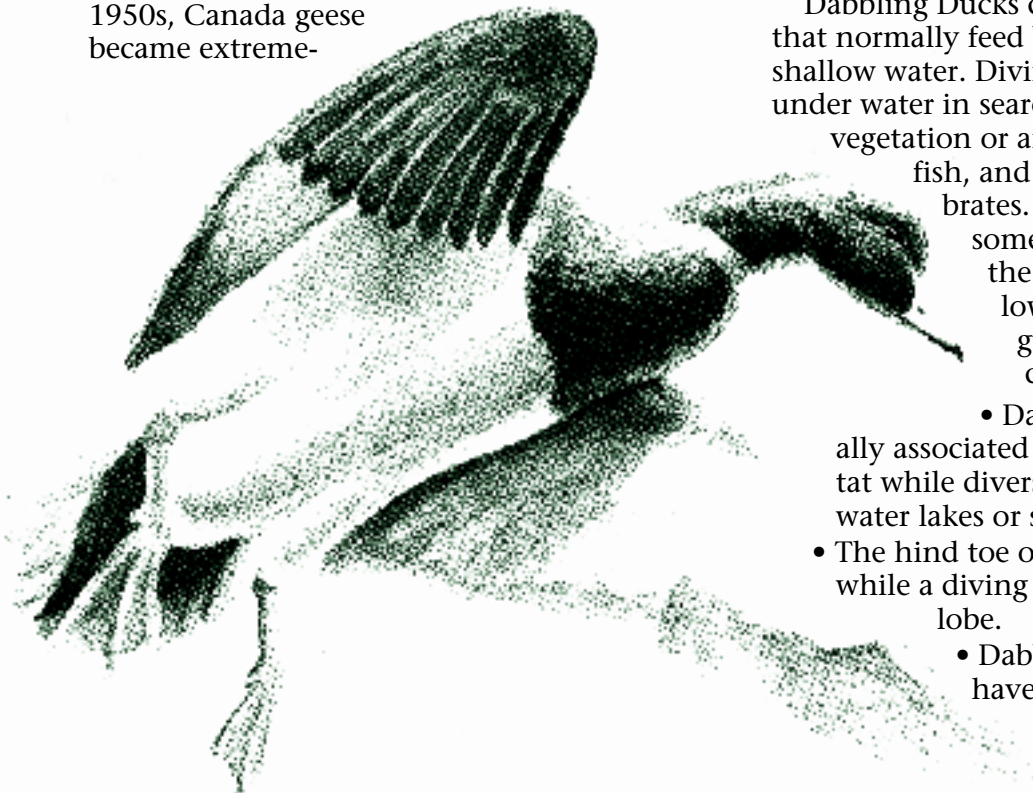
The importance of various groups of waterfowl to Maryland has changed over the years. During early times, diving ducks on the Chesapeake Bay were of prime importance for both subsistence and recreation. With the advent of extensive farming for corn in the 1950s, Canada geese became extreme-

ly important, forming the basis of a strong economic enterprise on the Eastern Shore. Most recently, numerous private landowners have turned their attention to managing private lands to attract other species of waterfowl to provide a diversity of recreational opportunities. Dabbling Ducks, which inhabit small wetlands and marshes, are most responsive to management efforts by private landowners. This fact sheet details the breeding, habitat, and management of Dabbling Ducks.

Physical Characteristics

Dabbling Ducks constitute those species that normally feed by “tipping-up” in very shallow water. Diving ducks feed by diving under water in search of submerged aquatic vegetation or animal life, such as clams, fish, and various other invertebrates. (Fact Sheet 611 describes some diving ducks found on the Eastern Shore.) The following characteristics distinguish Dabbling Ducks from diving ducks:

- Dabbling Ducks are generally associated with shallow water habitat while divers frequently use large open water lakes or saltwater habitat.
- The hind toe on a dabbling duck is small while a diving duck’s toe has a large lobe.
- Dabbling Ducks generally have a brightly colored specu-



lum (that portion of feathers consisting of the secondary wing feathers and those feathers that cover the secondaries) while diving ducks normally have a dull grayish or white speculum.

- The feet are located more toward the middle of the body on Dabbling Ducks, allowing them to walk on land more easily. On diving ducks the feet are located more toward the rear of the body, thus being more efficient for swimming and diving.
- When flushed from the water, Dabbling Ducks generally jump straight up into the air, whereas diving ducks require a “running” start along the surface of the water.

The following Dabbling Ducks are normally found in Maryland:

- Wood duck (*Aix sponsa*)
- American widgeon (*Anas penelope*)
- Gadwall (*Anas strepera*)
- American green-winged teal (*Anas crecea carolinensis*)
- Blue-winged teal (*Anas discors*)
- Mallard (*Anas platyrhynchos*)
- Black duck (*Anas rubripes*)
- Pintail (*Anas acuta*)
- Northern shoveler (*Anas clypeata*)

Life History

The majority of Dabbling Ducks nest in Canada, Alaska, and the northern prairie pothole states of North Dakota, South Dakota, and parts of Minnesota, Montana, and Nebraska. Dabbling Ducks breed on the wintering grounds where pair formation normally takes place. Pairing at this time ensures mixing of the gene pool since individuals from widely scattered breeding areas mix together on the same wintering ground. Generally, during the northward spring migration, the male will follow his mate to the breeding ground where she fledged. In this way, a male mallard hatched in Maryland may end up breeding with a female mallard in North Dakota.

Subsequent to arrival on the nesting grounds, males will defend a territory to provide adequate breeding habitat for the females. Territory defense is somewhat vari-

able between species, with some undertaking this activity much more vigorously than others.

Nesting sites for the various species are generally located in fallow fields or brushy areas where residual cover from the previous growing season may be found. Average clutch size for most Dabbling Ducks is 9 to 15 eggs. Incubation, by the female only, begins after the last egg is laid and is generally 23 to 30 days long. Unlike Canada geese, Dabbling Ducks do not mate for life; thus, they find a new mate each year. The male abandons the female during incubation. At this time, males congregate on large marshes where they undergo a complete molt.

Upon hatching and leaving the nest, young ducklings begin feeding on insect and invertebrate life, which is high in protein and needed for body growth. During this early period, the hen must brood them during cold or inclement weather. Gradually, they switch over to a predominantly vegetative diet by the time they are ready to fly at approximately 35 to 60 days old, depending on the species.

Subsequent to attaining flight, the young and the adult females begin congregating on larger marshes, referred to as staging areas. With the onset of cold weather, the fall migration is initiated.

Mortality Factors

Dabbling Ducks are subject to a variety of mortality factors, including hunting, predation, and disease. Approximately 25 to 79 percent of the dabbling duck population will die each year.

About 50 percent of all annual waterfowl mortality is directly attributed to hunting. Disease is the next most important mortality factor. Waterfowl are susceptible to a variety of diseases that may cause significant dieoffs. Generally, most disease dieoffs occur during the wintering period when waterfowl are both under stress and concentrated in large groups on small areas.

Predation is most common during the nesting season. At this time, both the adult hens and the eggs are vulnerable to a number of predators, such as red fox, raccoons,

minks, skunks, crows, gulls, and ground squirrels. Predators frequently reduce brood sizes by approximately 50 percent. Predation is not as common on the wintering grounds; however, peregrine falcons, eagles, or great horned owls occasionally take adult birds. In most instances, waterfowl taken by these predators are already sick or injured from other causes.

Distribution and Abundance

The primary importance of Maryland to waterfowl is provision of valuable migration and wintering habitat. While several species do breed in Maryland (mallards, black ducks, gadwalls, blue-winged teal, wood ducks), the numbers of these are small compared to northern populations.

Fall migration of waterfowl into Maryland begins in late summer with the arrival of blue-winged teal, green-winged teal, and pintails. Mallards, black ducks, gadwalls, widgeon, and shovelers begin arriving in larger numbers later in October and November. The majority of species migrate farther south as colder weather arrives; however, mallards and black ducks generally remain in Maryland throughout the winter, as do smaller numbers of widgeon, pintails, gadwalls, and green-winged teal. The most abundant Dabbling Ducks to winter in Maryland are mallards and black ducks.

Most Dabbling Ducks in Maryland live in surrounding marsh and wetland habitats of the Chesapeake Bay. In western Maryland, waterfowl are much more dispersed within small, isolated wetlands. During colder winter weather, most waterfowl staying in the western counties are forced toward the remaining open water of larger rivers and the Chesapeake Bay.

Concentrations of large numbers of waterfowl during spring migration are not as dramatic as in the fall. At that time of year, most species migrate north over a longer, protracted period of time and are more dispersed into smaller groups. Spring migration generally takes place from late February through April. The hardier species, such as mallards and black ducks, migrate ear-

lier, and others, such as teal and shovelers, migrate during the later period.

Habitat Requirements

Waterfowl spend up to 7 to 8 months out of the year on migration and wintering habitat. The quality of winter habitat affects the number of Dabbling Ducks returning the following year in two ways. First, excellent winter habitat allows greater numbers of waterfowl to survive this stressful period, thus allowing these additional survivors to return north to breed. Second, winter habitat conditions affect the body condition of those birds that do survive. Ducks surviving this period in better condition have a greater probability of being successful breeders.

All species of Dabbling Ducks do not use the same types of habitats, making management for the group as a whole very complex. No single vegetation or habitat meets all the needs of any of the species throughout the wintering period.

The basic habitat component is obviously wetlands; however, the water depth, water salinity, size of the wetland, and nutritional requirements influence which species of Dabbling Ducks will use the area.

Water Depth

Proper water depth is critical for the availability of food for Dabbling Ducks. Generally, water depths for the group as a whole should be less than 12 inches. Mallards and teal generally prefer the shallowest water of only several inches while the other species prefer slightly deeper areas of approximately 10 inches.

Water Salinity

Water salinity can determine which Dabbling Ducks will use a particular wetland. Generally, as water salinity decreases, a greater diversity of wetland plants will be found, thus providing a more varied habitat to meet the needs of a greater number of waterfowl species.

During the winter season, black ducks are most commonly associated with salt marsh habitat. They eat salt marsh snails, which are

heavily fed upon during periods of low tide. Other species, such as gadwalls and widgeon, are also frequently associated with high-salinity habitat where they often feed upon submerged aquatic vegetation in tidal ponds.

Size of the Wetland

Within larger wetlands, there is a greater probability that a variety of water depths, vegetation types, vegetation densities, and interspersions of open water will occur. As the diversity of these factors increases so do the diversity and numbers of waterfowl that use the wetland. Generally, wetlands in excess of 25 acres frequently provide the varied conditions required by a larger number of waterfowl species.

Nutritional Requirements

Nutritional requirements of waterfowl change during the course of the wintering period, and these changing needs influence what type of habitat they select.

The physical exertion of migrating from northern breeding areas to the winter habitat depletes much of a bird's stored energy and fat reserves. Thus, upon arrival at the wintering grounds, they must replace these reserves by feeding on high energy and protein content foods. After their body condition is restored, the fall season is generally not very stressful for waterfowl since weather remains somewhat mild and there is an abundance of ripened food. During this time, waterfowl build body reserves as insurance against severe weather later in the season.

During periods of extreme cold weather in the winter, most waterfowl restrict their activity to conserve energy. At these times, the number of feeding flights are reduced, and a greater proportion of time is spent resting. When feeding does occur, sources of food that are quickly and easily obtained and also very high in energy content are preferred. Frequently, flooded or accessible crops, such as corn, milo, or millet, will meet this need.

During the winter after pair bonding takes place, female Dabbling Ducks undergo a molt to replace worn feathers and to transform them into breeding plumage. Feathers are composed almost entirely of protein. Thus,

during the molt, waterfowl require foods that are high in protein content. To meet these demands, they frequently switch to a diet composed mostly of animal matter, which contains a higher proportion of protein than does a vegetative diet. At this time, Dabbling Ducks are often observed feeding in flooded woodlands where they primarily obtain various invertebrates that are very high in protein.

Prior to the northward spring migration, waterfowl feed heavily to store energy required for this demanding activity. At this same time, they begin acquiring the nutrient reserves required for reproduction. Reproductive costs of egg laying and incubation are very high for female waterfowl. During this period, they need large amounts of protein, lipids, and minerals, such as calcium, for egg production. Wood ducks obtain most of these nutrients when they arrive at their breeding grounds; however, most other northern breeding waterfowl obtain these nutrients at either the wintering area or migration stopover points. It is therefore very important to supply both high energy and protein content foods to waterfowl just prior to their northward migration.

Managing Dabbling Ducks

Most landowners do not have the luxury of being able to manage an extremely large area that provides a diversity of wetland types. Generally, one landowner has only a few management options within his or her control and, thus, must select the best management methods that are most cost-effective for meeting his or her objective. The following steps may be taken for waterfowl:

No Management

Sometimes no management may be the best course of action. If you already have a naturally occurring wetland on your property that is attractive to waterfowl, the best course of action would probably be to let it continue to function as it is. Natural wetlands are invaluable to humans and wildlife and are highly protected by both state and federal laws.

Protection from Disturbance

Often, valuable waterfowl habitat is “lost” to waterfowl solely because of the frequency and duration of disturbance. Disturbance of waterfowl may take many forms, such as high frequency of hunting, boating, trapping, aircraft, or any other type of human activity in the area. If disturbance becomes frequent enough, as waterfowl hunters are well aware, most waterfowl will stop using the area for a period of time.

Therefore, you should minimize disturbance factors as much as possible. Often this is not feasible or within your control; however, there may be a few actions that can be taken. If your land is hunted, you may restrict your hunting schedule to only specific days or for certain time intervals, such as mornings only. This will allow waterfowl to continue using the habitat for late-day feeding periods. You may also be able to restrict other forms of human activity on the area or possibly plant buffer strips between the activity and waterfowl habitat.

Management in Brackish or

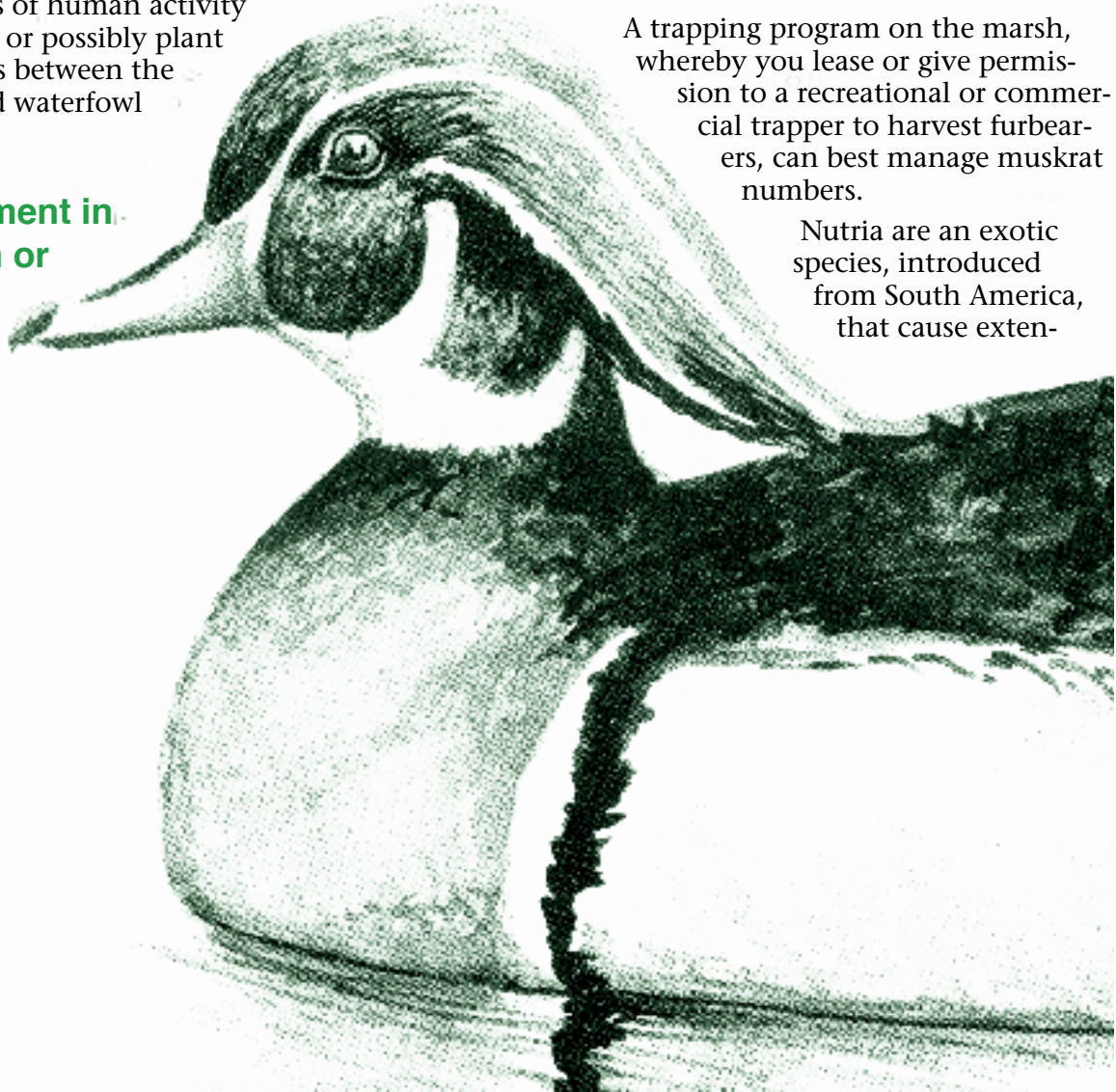
Salt Marsh Habitat

Within brackish or salt marsh habitat, there is often very little that can be done or should be done to enhance the area for waterfowl. These areas are highly regulated because of their value to both wildlife and estuarine species, such as shellfish and finfish.

You may improve the area’s attractiveness to waterfowl by managing muskrats and nutria. Both of these species feed extensively on marsh vegetation and have the ability to alter the ratio of open water to vegetation that is important to waterfowl. At very high densities, these muskrats and nutria destroy large areas of vegetation and create too much open water on a marsh; however, the reverse is also true at low densities where insufficient open water areas may preclude some waterfowl use.

A trapping program on the marsh, whereby you lease or give permission to a recreational or commercial trapper to harvest furbearers, can best manage muskrat numbers.

Nutria are an exotic species, introduced from South America, that cause exten-



sive damage to marshes as a result of their feeding activity. Every effort should be made to control their numbers on a marsh. If assistance is needed in setting up a furbearer management program, you may contact the Maryland Department of Natural Resources' furbearer biologist.

Open Marsh Water Management (OMWM) is an activity conducted by county mosquito commissions on brackish and salt marsh habitat to control mosquito populations. This activity generally consists of altering mosquito breeding areas or improving habitat in breeding areas for predatory fish, which feed on mosquito larvae. Most OMWM activities involve creating small ponds on the marsh or opening up different areas to tidal flow. Results of OMWM often create a more diversified habitat, which may be beneficial to various waterfowl and other wildlife species.

OMWM activities are not a management practice that may be undertaken by a landowner. Generally, if a section of marsh is particularly troublesome as far as mosquito breeding problems and if the marsh is suited for OMWM, then the mosquito commission will contact the landowner.

Planting Aquatic Vegetation

Establishing submerged aquatic vegetation (SAV) within marsh ponds for waterfowl food is a positive management action to consider. Various species of SAV, such as sago pondweed, widgeon grass, redhead grass, and wild celery, are extremely valuable to a large variety of waterfowl species and to a host of other wildlife.

Success of these kinds of plantings is extremely variable. Generally, if a marsh pond is suited for SAV, it will be established naturally. In rare situations where a pond is suited for SAV but there is none present, it may be planted by various methods. Identification of the species to plant and whether or not it will flourish in a pond depends on many factors, such as water salinity, pH, turbidity, water velocity, wave action, and even whether or not there are such rough fish as carp present in the pond.

Consult a professional before investing any time or money in planting SAV.

Farming on Agricultural Fields

Several species of waterfowl readily feed on waste grain left in agricultural fields. The primary species that capitalizes on this food source is mallards; however, black ducks, pintails, and, to a lesser extent, widgeon and green-winged teal occasionally feed on waste grain.

Generally, in Maryland, the crops that waterfowl feed upon most are corn, sorghum, soybeans, and millets. Most Dabbling Ducks do not graze; thus, unlike Canada geese, they will not make use of various clovers, ryegrass, or winter wheat. Flooding a field can greatly enhance its use by waterfowl for feed.

Within harvested fields, use by waterfowl will increase following heavy rainfalls that place several inches of sheet water on a field. At these times, a greater diversity and number of ducks will feed in low areas of a field where poor drainage results in several inches of ponded water. Blocking field drains after the crop is harvested may enhance these ponded areas. It should be noted, however, that continually allowing standing water to remain on an agricultural field can adversely affect soil fertility for future crops. Within many agricultural fields, ditch systems have effectively drained wetlands. Constructing dikes or plugs across the ditch systems may permanently restore these wetlands. This will reduce the size of agricultural fields but will improve habitat diversity for wetland-related wildlife.

Timing of harvest may also affect the amount of waste grain left in a field for waterfowl use. This is especially evident with corn, which, if harvested very early in the season, will germinate and sprout before cold weather arrives. When this occurs, the waste grain is essentially lost as a food source. For this reason, if waterfowl use of a harvested field is a high priority to the landowner, harvest dates should be delayed until cooler weather arrives to eliminate sprouting.

Constructing Shallow Water Impoundments

Shallow water impoundments managed specifically for wintering waterfowl can be extremely valuable because of the potential to produce large quantities of diverse foods

and the ability to make these foods readily available to waterfowl by properly regulating both timing and depth of water levels.

Construction of waterfowl impoundments is very expensive. Be extremely careful in identifying suitable sites for their location. It is essential to consider a number of location and design criteria when designing a new impoundment for waterfowl. The Natural Resources Conservation Service (NRCS) and your local Soil Conservation District can offer some help with location and design.

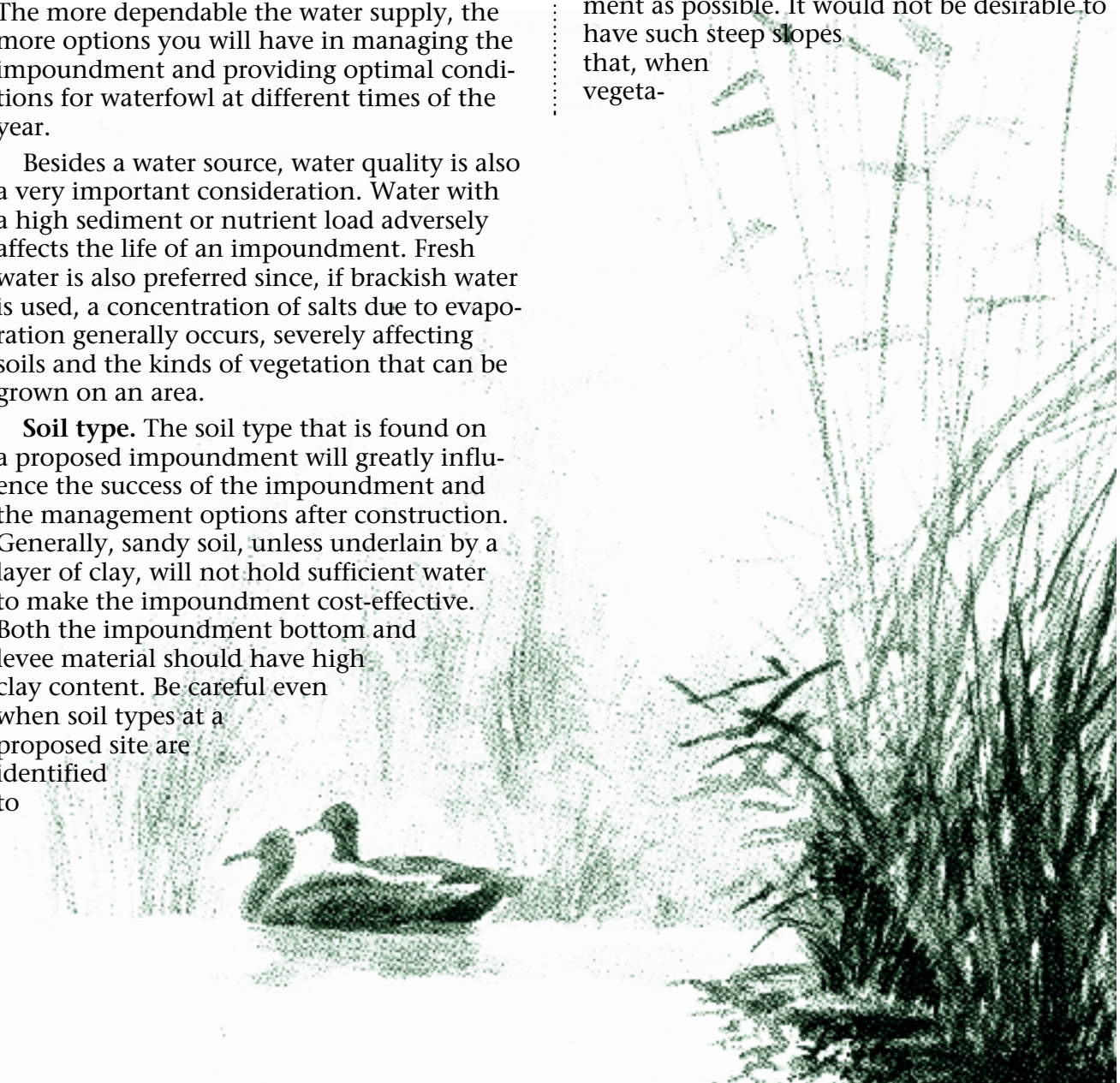
Water source. A reliable water source is the first consideration. Generally, water may be made available from natural runoff, ditch drainage systems, or well systems. The more dependable the water supply, the more options you will have in managing the impoundment and providing optimal conditions for waterfowl at different times of the year.

Besides a water source, water quality is also a very important consideration. Water with a high sediment or nutrient load adversely affects the life of an impoundment. Fresh water is also preferred since, if brackish water is used, a concentration of salts due to evaporation generally occurs, severely affecting soils and the kinds of vegetation that can be grown on an area.

Soil type. The soil type that is found on a proposed impoundment will greatly influence the success of the impoundment and the management options after construction. Generally, sandy soil, unless underlain by a layer of clay, will not hold sufficient water to make the impoundment cost-effective. Both the impoundment bottom and levee material should have high clay content. Be careful even when soil types at a proposed site are identified to

be high in clay. It is not abnormal to find a layer of clay soil underlain by sand. In this situation, if excavations during impoundment construction break into the sand layer, the breakpoint may serve as a drain for the impoundment.

Topography. Topography is critical to proper functioning and management of an impoundment. Optimally, the site should have a very gradual slope so that water can be drained off when needed and pools or ponded areas will not remain on the site, adversely affecting machine operation. A very gradual slope is also required to provide optimal water depths for feeding by Dabbling Ducks over as great a proportion of the impoundment as possible. It would not be desirable to have such steep slopes that, when vegeta-



tion is flooded over at higher portions of the impoundment, water depths over most of the area would exceed 18 inches.

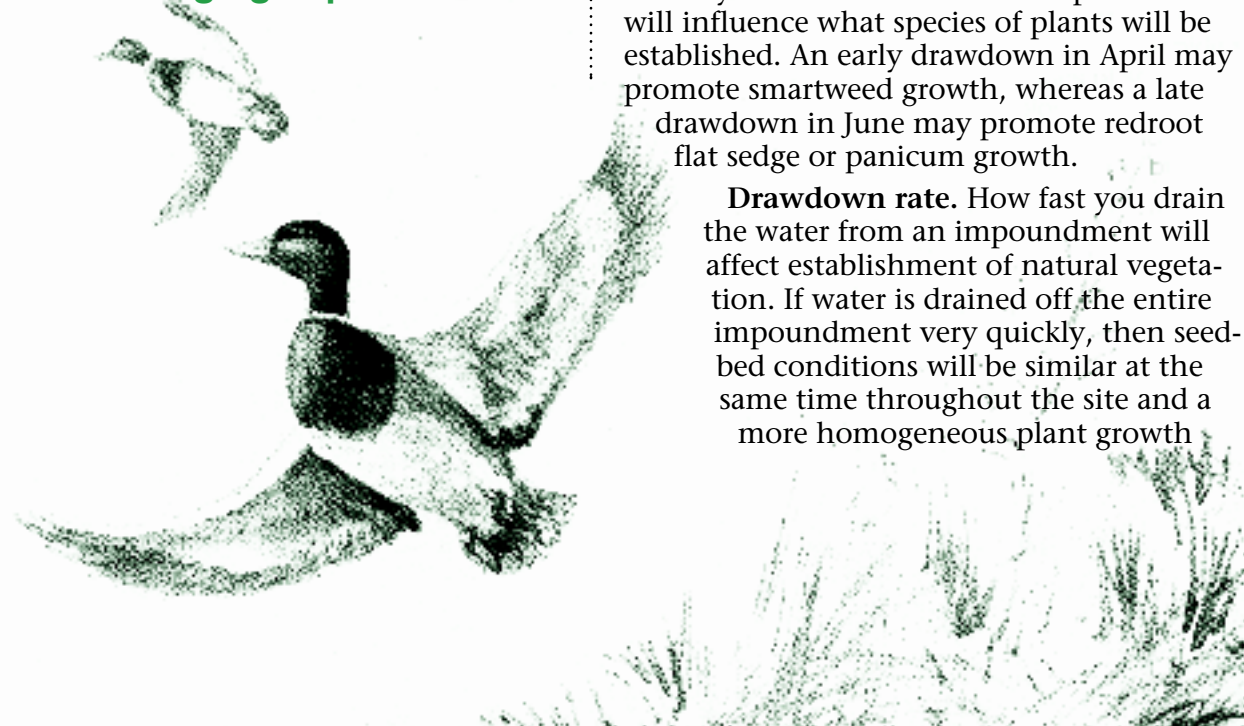
Existing vegetation. Existing vegetation on a proposed impoundment site provides some indication about potential management regimes as well as possible problems. If the area is currently supporting a diversity of high-value wetland food plants, such as smartweeds, millets, and sedges, you should maintain or encourage growth of these species.

Phragmites (reed grass) is probably the most important pest plant that could occur on most impoundment sites in Maryland. Phragmites can often become dominant on a site, crowding out all other desirable vegetation. When this occurs, the area may become a monotypic phragmites stand that provides little or no value to most wildlife species.

Impoundment Management

Basic impoundment management involves draining the water off during the growing season. Plant growth on these exposed soils will greatly exceed growth if water has been maintained on the area throughout the year, thus providing a much larger quantity of waterfowl food.

Managing Impoundments



for Agricultural Crops

If the management practice is to plant agricultural crops within the impoundment bottom, then timing of the drawdown is not critical and is normally scheduled to meet planting dates for the particular crop. The two most common agricultural crops planted within impoundment bottoms are Japanese millet or sorghum; however, other crops, such as corn, soybeans, German millet, or brown-top millet, may also be planted if soil conditions allow. Use the least possible amount of herbicides in impoundment bottoms. What appears as weeds to the farmer is often food to the duck; thus a weedy field of sorghum that contains panicum, bur marigolds, or pigweeds provides a greater diversity of waterfowl foods. Always strive to produce a variety of foods on an area and to avoid monocultures. Waterfowl cannot live very well on a single dietary component and must take in different food types to satisfy all their nutritional needs.

Managing Impoundments for Natural Vegetation

In managing an impoundment for natural vegetation, there are certain factors that you should consider:

Drawdown date. The time of year in which you drain water off the impoundment will influence what species of plants will be established. An early drawdown in April may promote smartweed growth, whereas a late drawdown in June may promote redroot flat sedge or panicum growth.

Drawdown rate. How fast you drain the water from an impoundment will affect establishment of natural vegetation. If water is drained off the entire impoundment very quickly, then seedbed conditions will be similar at the same time throughout the site and a more homogeneous plant growth

Table 1. Common plants that may be established on drained impoundments in Maryland.

Plant	Drawdown date*	Successional stage	Value to Waterfowl
Smartweeds	Early	Early	High
Redroot flatsedge	Late	Early	High
Bur marigold	Midseason	Early	High
Lythrum (<i>ammania</i>)	Very late	Early	High
Panicum	Late	Early	High
Crabgrass	Late	Early	High
Millets	Midseason	Early	High
Spikerush	Early-late	Early	High
Hyssop loosestrife	Early	Early	Low
Salt marsh aster	Early	Early	Low
Salt marsh fleabane	Midseason	Late	Low
Indian hemp	Early	Late	Low
Phragmites	Early-late	Late	Low

Early season drawdown should be performed during late March or April. Midseason drawdown should be conducted during May. Late season drawdown should be conducted in June.

will develop. If water is drained very gradually over several weeks, different seedbed conditions will be provided as the water slowly recedes, yielding several zones of vegetation and a greater diversity of food plants.

Soil type. The type of soil along with its fertility and other factors, such as salinity, will influence establishment of natural vegetation. A highly organic soil that remains moist may produce a lush growth of redroot flat sedge while an adjoining mineral soil with all other conditions remaining constant may produce a preponderance of panicums and wild millets. In areas of very high soil salinities, problem species, such as salt marsh aster or salt marsh fleabane, both of which have little value to waterfowl, may be produced.

Weather. The weather will affect which plant species you choose to establish. Excessive rainfall may adversely affect drawdowns, flood out and kill certain species, or enhance the growth of other species. Drought conditions can have the same effect by causing some plant species to wither and die, allowing other, later-germinating species to take over a site.

Natural succession. Generally, you will produce larger quantities of food with early successional stage vegetation. Most agricultural crops, such as corn, milo, soybeans, and wheat, are early successional stage plants and produce large quantities of seed. Natural

vegetation follows the same general rule, with early stage plants, such as millets, smartweeds, panicums, or herbs, producing greater quantities of seeds than later-successional plants, such as willows, asters, or broom sedge.

If good, seed-producing natural vegetation is a management objective, then succession of the site must be “set back” when the species observed begin to change over to those that are undesirable. Succession of an area can be set back by disking the soil, burning if feasible, or even maintaining water in the impoundment during one or two growing seasons. Generally, to maintain high-seed-producing vegetation, natural succession should be set back after several years of no manipulation.

Available seedbank. All soil contains a large quantity of seed lying dormant and awaiting the proper conditions for germination. The species of seed comprising any area’s seedbank will influence the type of vegetation established. Thus, each wetland site may respond differently to a given set of conditions. Although seed diversity within most seedbanks is large, given the proper seedbed conditions, standard predictions may be made about resulting vegetation growth. Some common species of wetland vegetation that are important to wildlife and should be promoted within impoundment management programs are listed in Table 1.

Reflooding Impoundments

The date and depth to which an impoundment is reflooded in the fall is critical to waterfowl use. A number of factors—species of waterfowl desired, vegetation available on the site, your objectives for what time during the winter you would like waterfowl to use the area, and reliability of water source—will influence the reflooding schedule.

If you would like an early season habitat for teal and pintails, then the impoundment should be given a shallow flooding—less than 6 inches of water—during late August or early September. Water depths should be kept very shallow for continued use by these species. As food is depleted in lower portions of the impoundment, the water level should be raised gradually to make new food sources available. If excessive rain causes a large increase in water level and a decline in waterfowl use, then the water level should be lowered. This will put the food resources back within reach of Dabbling Ducks.

If you wish to attract other waterfowl species, such as widgeon, gadwall, mallards, and black ducks, then you should reflood later in the fall, beginning in October or November. The same strategy of maintaining a shallow water level and gradually increasing depths to make new food sources available as lower areas are depleted also applies for these species.

You should consider timing food availability throughout the wintering period. Frequently, land managers will flood all available food during the fall migration and hunting season to attract as many waterfowl as possible. When this occurs, only a few “easy picking” food resources may be available later in winter when weather will cause the birds stress. It is, thus, important to continue providing high-quality feeding habitat throughout the winter.

The type of food growing within an impoundment can also influence when the area should be reflooded. Some species, such as teal and pintails, prefer very small seeds to feed on. Thus, if an impoundment has a high proportion of lythrum (genus *Ammannia*) or redroot flat sedge vegetation, both of which provide very small seeds, then it may be wise to reflood in late August or September for these early migrants.

Another way in which vegetation species may affect reflooding dates is how quickly the seeds deteriorate (rot) when inundated with water. Natural wetland plants generally retain their nutrient value much longer than flooded agricultural crops. Soybeans break down and lose almost 90 percent of their energy content after only 90 days of flooding (Table 2).

Based on this information, we can assume that if a soybean crop were flooded on September 1, the remaining seeds would

Table 2. Deterioration of selected seeds after 90 days of flooding.

Plant name	Decomposition (percent)
Soybean	86
Barneyardgrass (Japanese millet)	57
Corn	50
Common buckwheat	45
Milo (sorghum)	42
Giant bristlegrass	22
Pennsylvania smartweed	21
Cultivated rice	19
Water oak (acorus)	4
Hemp sesbania	4
Horned beakrush	2
Salt marsh bulrush	1

Table reprinted from Frederickson and Reid (1988).

have little energy value left by December 1. Therefore, if agricultural crops are involved, reflooding the impoundment should be delayed as long as practical until waterfowl use of the crop is desired.

Conclusions

A number of factors are involved when managing waterfowl, and each area presents different problems and results. If, in addition to dealing with the complexities of waterfowl management, you wish to perform habitat improvement projects, you must also be concerned with numerous local, state, and federal laws that regulate wetland activities. We recommend that you contact government or private organizations familiar with waterfowl management before undertaking any new habitat improvement projects.

The following organizations may be able to provide assistance to the landowner in managing for waterfowl:

- Maryland Department of Natural Resources
Forest, Park, and Wildlife Service
P.O. Box 68
Wye Mills, Maryland 21679
- Maryland Cooperative Extension
University of Maryland (educators are located in each county)
- Soil Conservation Service
- U.S. Fish and Wildlife Service (contact the nearest Wildlife Refuge)
- U.S. Army Corps of Engineers

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Fact Sheet 597 Introduction to Wildlife Management

Fact Sheet 598 Planting Crops for Wildlife

Fact Sheet 599 Brush Piles for Wildlife

Fact Sheet 600 Field Border Management

Fact Sheet 601 Eastern Cottontail Rabbits

Fact Sheet 602 Bobwhite Quail

Fact Sheet 603 Ring-necked Pheasants

Fact Sheet 604 Ruffed Grouse

Fact Sheet 605 Mourning Doves

Fact Sheet 606 Eastern Wild Turkeys

Fact Sheet 607 Tree Squirrels

Fact Sheet 608 Black Bears

Fact Sheet 609 Wood Ducks

Fact Sheet 610 Dabbling Ducks

Fact Sheet 611 Diving Ducks

Fact Sheet 612 Canada Geese

Fact Sheet 613 Songbirds

Wildlife Management: Eastern Wild Turkeys

by

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Blackwater National Wildlife Refuge

U.S. Fish and Wildlife Service

Cambridge, Maryland

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