TECHNICAL NOTES

U.S. DEPARTMENT OF AGRICULTURE NATURAL RESOURCES CONSERVATION SERVICE
PORTLAND, OREGON MAY 2006

BIOLOGY TECHNICAL NOTE NO. 48

WOODLAND FISH AND WILDLIFE: HABITAT MANAGEMENT FOR TURKEYS ON SMALL WOODLANDS

The enclosed Technical Note was published by the Woodland Fish and Wildlife group. It provides some broad management ideas, some tables identifying wildlife species primary habitats, and deciduous trees and shrubs native to Oregon and Washington.

Other wildlife publications are available online at http://www.WoodlandfishandWildlife.org.

MISC0535

Woodland
Fish and Wildlife

Habitat Management for Turkeys on Small Woodlands

Seeing flocks of wild turkeys along forest roads and in adjacent small fields is increasingly common throughout much of the forested areas of Oregon and Washington. Many forest land owners can long remember turkeys showing up at livestock feeding stations in winter, hearing the loud gobbling of the males echoing across forest land during the spring breeding season, or seeing their familiar scratchings in soil on the forest floor. Some landowners even consider them pests when the big birds tear up gardens near homes. Other landowners have yet to see or hear turkeys, even though they believe they have suitable habitat. What many don't realize is that wild turkeys are relatively recent additions to the wildlife of this region.

HISTORY

Wild turkeys are native to North America, but they did not originally occur in Oregon or Washington. Of the five recognized subspecies of turkeys common to the United States, three were introduced to the Pacific Northwest primarily to establish populations for hunting. Original releases are believed to have begun more than 80 years ago in Washington and 100 years ago in Oregon, but these early attempts largely failed to establish widespread self-maintaining populations. Pen-reared birds were used in these first release attempts and as a result, the birds were not well adapted to survival in the wild.

Beginning in 1960 the Washington Department of Fish and Wildlife (WDFW, formerly the Department of Game) released small numbers of wild turkeys near the Columbia River gorge in Klickitat County and about a dozen birds near the Stevens County town of Rice in northeastern Washington. These birds were of the Merriam's subspecies native to the open Ponderosa pine forest lands of the intermountain west. In the late 1980s the WDFW began an aggressive effort to establish populations in other areas of eastern Washington with birds of the Rio Grande subspecies from the southwestern United States. At the same time, the Eastern wild turkey, the most common subspecies found east of the Mississippi River, was stocked in several locations in southwest Washington.

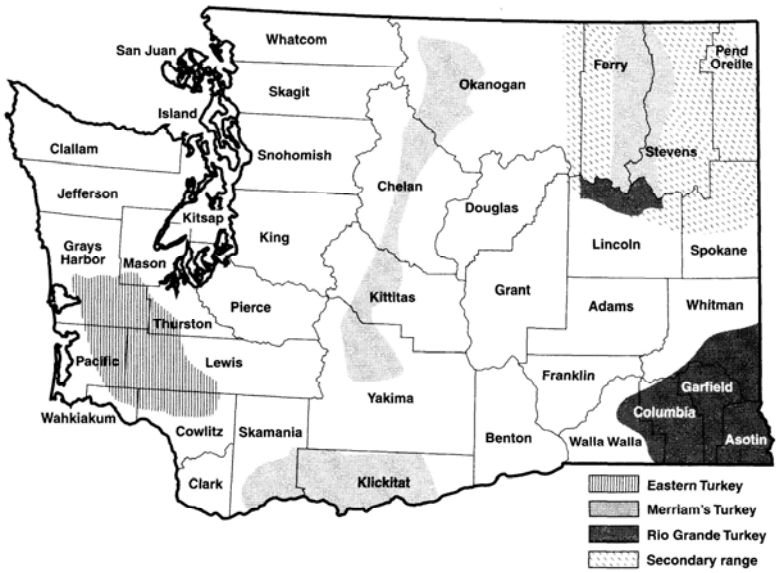
Oregon entered into a wild turkey management program at about the same time as Washington. The Oregon Department of Fish and Wildlife (ODFW) began with releases of the Merriam's subspecies into northeast and north central Oregon in 1961. These releases were deemed to be successful and self-sustaining populations were established in those areas. Bolstered

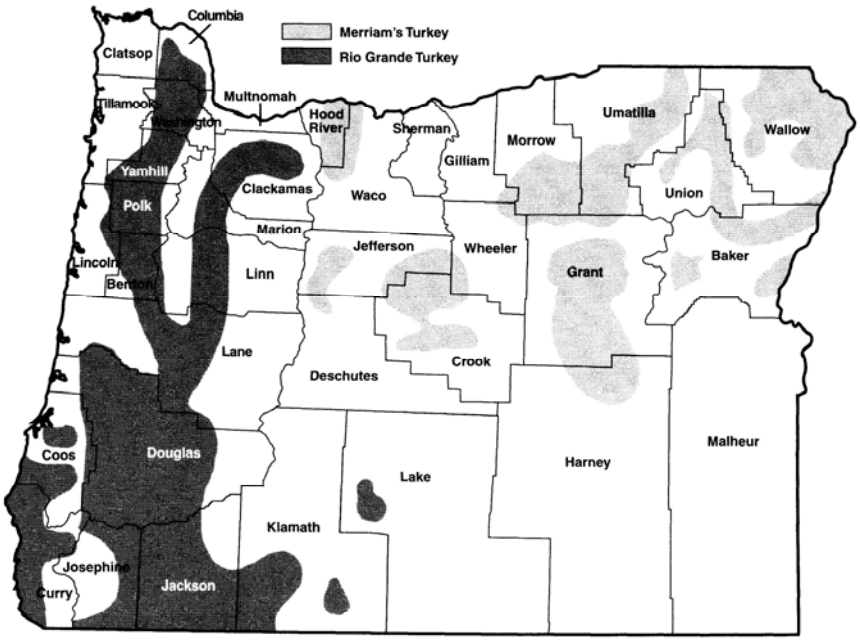
by this initial success, releases of the Rio Grande subspecies were made into southwest Oregon in 1975 and again during the early 1980s. Starting in the mid-1980s, Oregon began a very aggressive trap-and-transplant program. Using birds trapped from the wild within Oregon and from other states as well, the Rio Grande subspecies was released in suitable habitat throughout the state.

From releases and continued trapping and transplanting from established flocks, viable populations of the three subspecies have been established throughout Washington and Oregon. By the end of the twentieth century, populations were well into the tens of thousands for the Rio Grande (most common subspecies) and Merriam's subspecies in the two states. Eastern subspecies populations were substantially smaller but growing in southwestern Washington. By the turn of the century, numbers were high enough and overall populations healthy enough to allow liberal hunting seasons in both states. Though various subspecies have been introduced into appropriate habitats, the strains may not be pure because mixing has likely occurred.

Competition. Concern has been raised that introduced wild turkeys may compete with native wildlife to the detriment of either the local fauna or flora common to this area. No literature or concrete evidence exists indicating competition or harm occurring in the environments into which they have been released. However, the results of introduction continue to be monitored for effects on native flora and fauna.

Range distribution of wild turkeys in Washington and Oregon





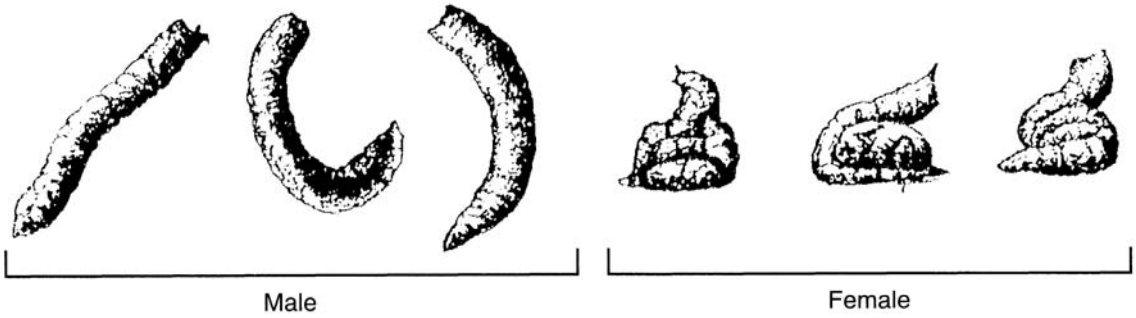
LIFE HISTORY

All three subspecies share many common characteristics. The hens typically weigh from 7–9 pounds their first year and from about 10–13 pounds when mature. The gobblers or toms (males) vary in size from about 12 pounds at one year of age (referred to as "jakes") to over 20 pounds in older age classes. There are several physical differences between the sexes and age classes. Turkey gender can also be identified by their droppings (feces). Gobbler droppings are about the size of the little finger with a slight crook at one end. Hen droppings are smaller and shaped like a corkscrew. Tom turkeys develop a modified feather growth called a beard. The feathers of the beard resemble coarse hairs and grow from the middle of their breast, generally becoming longer with age. Hens occasionally grow a beard but it is usually quite small. Turkeys have excellent senses of both hearing and sight. They are strong and fast runners and are also strong, fast flyers although their flights are usually of short duration compared to other wild birds of their size.

The dominant gobblers, those two years and older, mate with as many hens as they can claim in the spring. Some hens can begin mating at the age of one year. The courtship ritual is colorful with wild toms displaying in much the same manner as their domestic kin. After mating, the hens disperse and begin laying their clutch of eggs in a simple nest on the ground, usually in the forest with low vegetation surrounding the nest site. Most successful nests are in areas with considerable brushy habitats. Typically, forest stands favored by turkeys are somewhat open, such as those that have been thinned but with woody debris left in place. Clutches take about two weeks to complete. Clutch size has a broad range but typically contains 10–12 eggs. Hatching occurs after 26–28 days of incubation. Development of the poults (young turkeys) is rapid. The youngsters follow the hen and begin feeding within a day of hatching, begin short flights within two weeks, and are roosting in trees at night by three weeks of age.

There is both safety and danger in numbers. Turkeys usually form flocks of hens and young of the year during the summer and following winter. Mature toms often form small separate bachelor flocks and then begin mingling with the breeding age hens during late winter and into the spring breeding season. A flock of sharp-eyed turkeys, all watching for danger, makes it very hard for an individual predator to mount a successful attack. Most common predators are coyotes, great-horned owls, bobcats, and raccoons. Bobcats seem to be especially adept at taking nesting hens. However, predation is rarely a serious issue for a population unless turkey numbers are depressed and escape and hiding cover is inadequate.

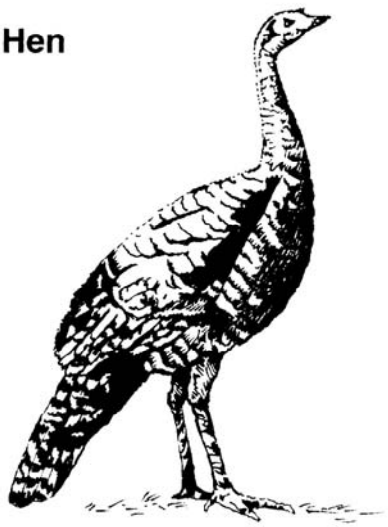
Turkeys are susceptible to occasional infectious diseases and parasites that can spread rapidly in birds in close contact with each other. While most of these health problems rarely cause severe problems except in the young or when nutrition is poor, a few diseases can be lethal, causing serious problems to flocks or even local populations. Of great concern are pathogens that spread from domestic fowl (including recent remains of dead birds) to wild turkeys. These diseases may be spread by direct contact with infected chickens and turkeys, their



The sex of some wild turkeys can be determined by the shape of their droppings.

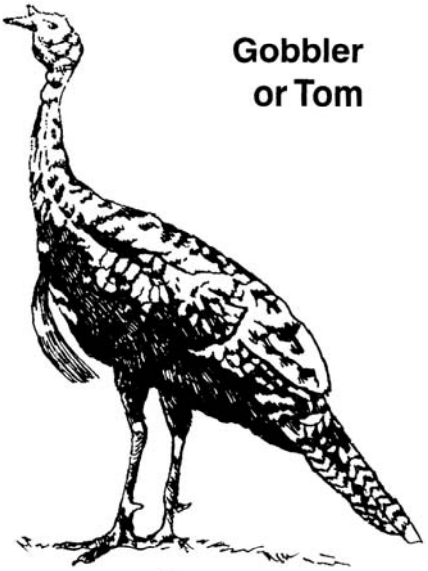
Sex and age of wild turkeys

Hen



Middle toe under
4½ inches long

Gobbler or Tom

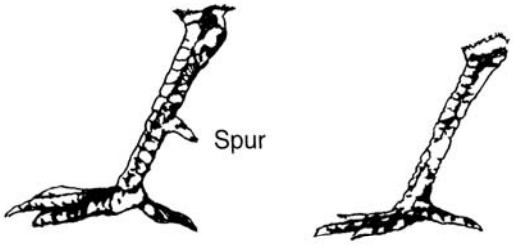


Middle toe over
4½ inches long

Outer wing feathers

Adult Immature Adult Immature

Tom Hen



Tom Hen

Breast feathers

Tom (black tip) Hen (buff tip)

Tail feathers

Mature Tom (adult) Immature Tom (juvenile)

droppings that are spread on fields, and by infected food. Thus, a real danger exists for turkey flocks that may feed or rest in and around farmsteads and feedlots. Parasitic diseases such as blackhead and coccidiosis are especially harmful to wild turkeys. These diseases can easily spread from the above noted sources to wild birds where they may ravage a flock. A few species of mold that sometimes grow on old agricultural grain and cause aflatoxin may impact turkeys. These often are found on waste grain in livestock feed lots or in old grain used to feed birds.

Wild turkeys have lived for more than 12 years in captivity. Life in the wild is more challenging; a five-year old wild turkey is an old-timer and one approaching 10 years of age is a very rare and lucky bird.

HABITAT REQUIREMENTS

Depending on the subspecies and location, turkeys use a variety of habitats for their food, shelter, and cover requirements. All three subspecies in the Pacific Northwest use two habitat features in various quantities and arrays. These features are trees and grasslands. Neither continuous forest canopies nor open treeless landscapes alone are suitable habitat. Trees and associated understory vegetation supply food items as well as escape cover and night time roost sites. Non-forested openings, including agricultural fields and recent clear cuts, supply food in the form of green herbaceous matter, insects, seeds, and fruits. Amount and timing of use of these different habitat types depends on time of year. Winter finds birds using forested areas for the shelter they afford as well as the food they supply. During summer and early fall, agricultural field borders and grassy areas near forested environments supply more food items to turkeys.

The Rio Grande subspecies of wild turkey uses the most open environments and will forage some distance away from forests. Eastern wild turkeys seldom venture far from the protection of forest habitat, and forage along the edges and in small pastures, crop fields, and recent clear cuts. The Merriam's subspecies select agricultural fields and meadows more often for foraging, but usually stay close to forested environments so escape cover is nearby.

Nesting. Turkeys nest on the ground in a variety of locations but a few characteristics are almost always present at the more successful nest sites. Overhead cover (tree canopy) and a relatively dense lower canopy are usually present, as well as very dense ground cover up to about one foot in height. Nests are often built against a guard object such as a tree and/or solid brushy backdrop for protection from predators approaching from behind. Hens like to have good visibility above the ground cover on three sides. Successful nest sites supply shelter from the elements and are well hidden from predators while offering a view to the sharp-eyed brooding hen. Only the hen incubates the eggs and raises the young. After hatching, the hen leads the brood away from the nest site and extensive foraging begins, fueling rapid growth.

Food Requirements. Food requirements and foraging areas change with the seasons and age of the birds. Turkeys are quite versatile and very adaptive when it comes to eating. The list of food items they have been known to consume is vast. However, a few food types really stand out and are very important seasonally. These foods include mast (such as nuts and acorns); grasses and a long list of other herbaceous plants; insects; and some agricultural grains such as wheat, oats, barley, and corn. Seeds of some conifers such as Ponderosa pine and occasionally Douglas-fir are important diet components, as well.

Spring—Hens with broods must have grassland environments for successful survival of young. These grasslands must have a ready supply of insects during the first few weeks of life for good muscle and bone development of the young. These areas need to be large enough so that hens and poults can forage throughout the day. A hen and her brood may cover 75 acres in a week foraging for insects and up to 250 acres during the course of the summer. Although the vegetation must be tall enough so that sufficient food and hiding cover is available, the hens also must be able to spot predators above the grass. Therefore, the best brood habitat contains vegetation about one to two feet in height. Native grasslands, ungrazed or lightly grazed pastures, and some hayfields readily supply these needs. Open woodlands, as in older Ponderosa pine forests with grass and herbaceous understory, are readily used when available. Older Douglas-fir forests on the west

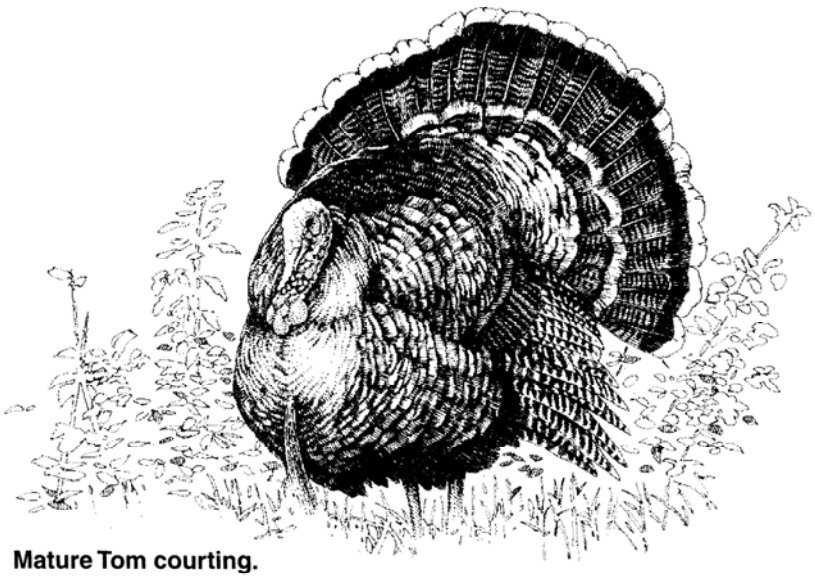
side, especially those that have been logged with multiple thinning entries that have left a more open understory, also provide good brood-rearing habitat. Recent clear cuts that have numerous grassy openings are also used extensively, especially within the range of the Eastern wild turkey.

Summer and Autumn—As the summer progresses, broods as well as hens and toms feed heavily on seeds, grasses and related species, green herbaceous plants, soft and hard mast (berries, nuts, and hard seeds), and agricultural grains. There is decreasing reliance on insects. Late summer and autumn seasons find the birds relying a great deal on mast (both soft and hard); grasses and other green herbaceous plants; and seeds of conifer trees, especially Ponderosa pine. Where oaks are found, acorns are an important food item. Soft mast forms an increasing part of turkey diet at this time of the year, produced by shrubs including serviceberry, hawthorn, buffaloberry, mountain ash, wild rose, poison oak, elderberry, currant, salal, and Oregon grape. Insects are still consumed, especially prior to frost. At this time of year, flocks of Rio Grande and Meriam's wild turkeys may be seen foraging on grasshoppers in the irrigated hay fields of eastern Washington and Oregon. All three subspecies readily feed on agricultural grains (corn, oats, wheat, barley, and legumes), especially after the fields have been harvested, although they will also feed on standing grains.

Winter—Winter can be a tough time for wild turkeys if prolonged periods of inclement weather occur. Waste grain is still an important food item where it can be found if the snow is not too deep for turkeys to forage. Greens are consumed as they are found, especially around springs, seeps, and riparian zones. Springs and seeps can be particularly important during periods of heavy snowfall as the flowing water may keep some of the ground free of snow and ice. Greens may become more lush around these water sources, and some invertebrates (and small vertebrates as well) are found and consumed by wild turkeys. Mast is very important in the winter. Hard mast and seeds of pine, fir, and oak as well as persistent soft mast from most of our native shrubs (even if shriveled and/or frozen) are readily consumed.

To secure shelter, turkeys may spend more time in forested environments during harsh winter weather. Therefore, food items found in forested areas (listed above) take on greater significance in the winter. Healthy adult turkeys are capable of scratching through relatively deep snow and brush for food items. Although they may survive extended periods with little or no food (up to two weeks if sufficient shelter is available), productivity and overall survival may decline. Quality and quantity of foods, especially in winter, are very important to maintaining populations.

During winter, livestock feed lots and farm and ranch headquarters often have large quantities of waste grain, hay, and other farmstead foods available that attract flocks of turkeys. Additionally, some landowners may intentionally scatter grain near the farmstead to attract turkeys. While some flocks may spend relatively long periods of time feeding in these settings, this can expose them to several diseases and parasites that may prove fatal. Additionally, they may become so accustomed to acquiring feed around buildings that they lose their fear of people and human habitations, and this behavior can



Mature Tom courting.

Immature Tom

lead to increased mortality around properties that are less friendly. ***People who want to give a helping hand to wild turkeys are better off forcing the turkeys to forage within suitable forest and adjacent field habitats.***

However, there are certain situations where supplemental feeding in winter may actually increase the turkeys' survival. These situations might occur during prolonged periods of deep snow (over 1 foot in depth) when the birds are not able to forage through the snow and ice. After one week of these conditions where continued cold weather and snows are predicted, winter feeding may be considered for use in forested habitats. People wanting to feed during these conditions should contact local state wildlife management biologists to discuss the acceptability of feeding and be prepared to use only fresh, clean grain to reduce possible fungal poisonings.

Water. In moist environments and during periods of adequate rainfall, turkeys satisfy much of their water needs from the foods they consume. During extended periods of little or no rainfall, they may seek open water on an as-needed basis. Streams, rivers, ponds, wetlands, springs, seeps, and even ditches and roadside depressions may supply their water needs at that time.

Roosting. Although turkeys nest and forage on the ground, they prefer to roost in groups and usually fly to large branches in trees for night shelter. Isolated trees are rarely used for roosting. A single tree in a stand may be used by a large number of birds if it has sufficient height and large-diameter horizontal branches capable of supporting the weight of numerous birds. Roost trees are typically larger in height, canopy coverage, diameter, and basal area than adjacent trees in a stand. Douglas-fir are most often selected for roosting on the westside. Ponderosa pine trees are used most often in eastern Washington and Oregon. Oregon oak is used where it occurs. Stands that are best for roosting are sheltered from prevailing winds and are usually multi-layered, mature mixed conifer forest. In one study the timber in these stands averaged 148 cubic feet per acre and had greater canopy coverage and height than stands not selected for roosting.

MANAGEMENT RECOMMENDATIONS

In general, a mix of forest and open areas must be maintained in appropriate condition for wild turkeys. Depending on the locale and the subspecies of turkey, various sizes, densities, and distribution of these habitats should be maintained or developed. Even in the absence of active management, there are some general practices that should be avoided.

Do Not:

- Feed wild turkeys (except during prolonged periods of extreme winter weather where snow covering is more than 1 foot in depth) or attempt to attract them to farm and ranch operations that have domestic fowl and/or livestock feeding operations.
- Confine livestock in small forest stands, so that desirable habitat features will be protected from overgrazing and trampling.
- Attempt to stock turkeys on your own (always contact the appropriate state fish and wildlife agency for trapping and transplanting wild turkeys).
- Eliminate mast-producing shrubs and trees (these are usually referred to as "brush") in established forest stands and plantations.

There are many management practices focused on turkey food, shelter, and cover that can be implemented to protect, enhance, or create habitat in forests and adjacent non-forested areas. Remember, the goal is to create that mix of woodland and open areas that supply the grass and shrub habitat turkeys feed in, along with adequate cover. Such areas will include sufficient nesting and brood rearing habitat as well as forested escape cover and roosting trees. In the process of enhancing an area for

wild turkeys, many native species of wildlife that nest, den, hide, or forage on the forest floor and adjacent openings or in mature native timber will also benefit.

Forest Habitat

1. **For roosting,** some mature timber should be maintained that has low exposure to prevailing winds. Ponderosa pine should dominate on the east side of the Cascades and Douglas-fir on the west side. Where Oregon white oak occurs, these trees should be maintained. Maintenance of established Oregon white oak may require removing conifers that are overlapping oak crowns, as this species is very shade intolerant.

2. **Young dense stands should be thinned** to allow sunlight to strike the forest floor. This will stimulate the growth and development of grasses, forbs, and shrubs that can provide turkey foraging habitat. Thinning will also release residual trees and allow increased height and diameter growth. Where possible, implement a variable-density thinning regime in stands slated for a thinning treatment. This involves thinning some patches within the stand more heavily (even clear cutting) and some patches very lightly or not at all. Variable-density thinned patches should total at least one-fourth of the stand with the remainder thinned with a standard forestry thinning regime. This management mixture promotes grass, forb, and shrub development in the heavily-thinned patches and nesting and escape cover in the lightly thinned or unthinned patches. ***Within turkey habitat, a patch is described as at least 100 feet in diameter.*** Ideally, a patch should be at least one standard tree height in diameter. Heavy thinning means leaving no more than 40% canopy closure when the thinning operation is completed. An alternative to heavy thinning is to use a group selection cut or clear cut to create a forest opening. In extensively forested landscapes where more than 80% of the landscape is actively managed, clear cuts or heavy thinning that promotes understory development can be applied to be several acres with the remainder of the unit thinned in the normal pattern. From another perspective, in mature Ponderosa pine forests that are to be logged, it would be beneficial for turkeys to maintain a tree basal area of about 87 square feet per acre. In Eastern wild turkey habitat of western Oregon and Washington, clear cuts should not exceed 30 acres in size. If a few residual mature trees still exist in these units, they should be maintained for turkey roosting and for cone production.

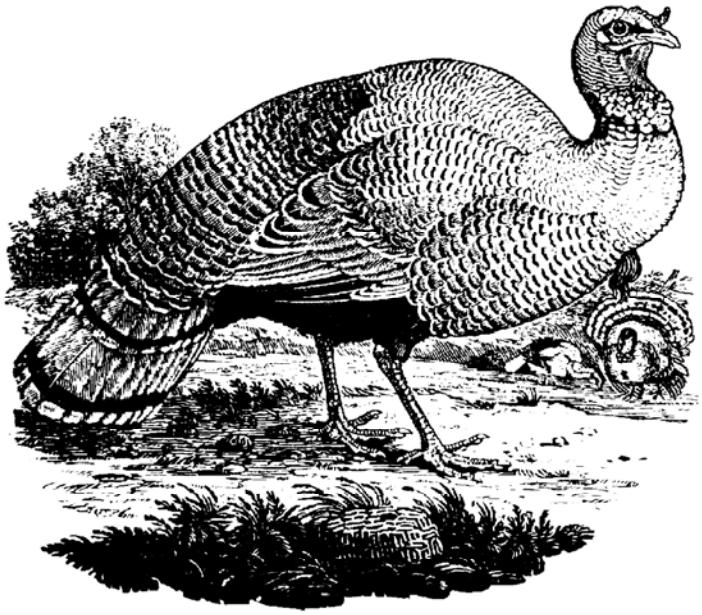
3. **Young plantation management** for wild turkeys is challenging. Many native shrubs and ground covering vegetation compete with shade-intolerant conifer seedlings and are typically removed to stimulate the growth of the conifers. Much of this ground cover constitutes turkey food, nest, and brood habitat. Where possible, maintain the mast-producing trees and shrubs, as well as grasses. Where competition with conifer seedlings is a major concern, retention of grasses, forbs, and shrubs may best be accomplished along edges, in riparian zones, around springs and seeps, around and within green tree retention patches, and on or adjacent to landings and skid trails.

4. **Light grazing by domestic livestock** can be tolerated and can assist in keeping some forest stands from becoming too dense for turkeys. However, in areas where nesting occurs, cattle should be kept off during nesting season. Livestock should not be permanently confined to forested areas as the continual trampling and grazing destroys nests and food resources.

5. One of the best practices that can be implemented is **planting turkey food**. Large disturbed areas such as logging landings, skid roads, burned slash piles, turnarounds, and sites where livestock have exposed forest soils can be sown with a forage seed mix. Mixtures that contain at least one variety of legume (clover) are excellent. Several mixtures are available that contain multiple clover species, as well as annual and perennial grasses. These will usually need to be mixed by agriculture seed companies or may be available through state fish and wildlife agencies or nonprofit organizations including the National Wild Turkey Federation and the Rocky Mountain Elk Foundation.

If mast-producing shrubs and small deciduous trees are absent they may be planted. Some species that contribute to optimum turkey habitat include serviceberry, chokecherry, hawthorn, wild rose, snowberry, kinnikinnik, elderberry, mountain ash, sumac, wild plum, and currants. Buffaloberry is also a good east side species. Many of these native species occur on the west side and should be maintained or planted. Mast-producing ground covers that may be planted include Oregon grape and salal.

6. **Water management**—Springs and seeps are excellent components of turkey habitat. They are not only used as a source of seasonal water, but for providing insects and other invertebrates, vertebrates, and greens during the dry months and well into the winter when much of their foraging habitat is covered with deep snow. These sites should be protected from livestock grazing. Small seeps can be excavated to form small pools or the outflow blocked to capture surface water. Created pools do not need to be deep; less than 1 foot of depth is sufficient. A primary consideration is making sure that at least one side of the pool has a gentle slope (at least a 1:3 depth to slope ratio). This will ensure that small animals will not become trapped and drown. Native vegetation including wetland plants should be maintained around the borders, but one side should be kept relatively open for ingress and egress by turkeys and other wildlife. Nonnative invasive plants such as reed canary grass need to be controlled. Where livestock are watered, including from tanks, overflow can be captured away from the tanks or other devices and treated the same as springs and seeps.



Non-forested Habitats

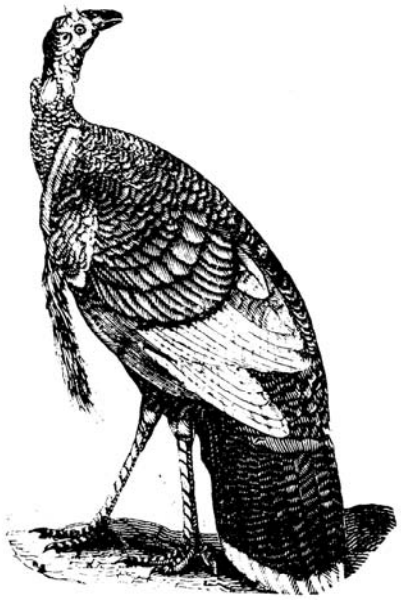
7. Turkeys forage extensively in non-forested environments, especially the Rio Grande and Merriam's subspecies. Grasses should be allowed to mature in some areas, such as around field borders adjacent to forest stands. This will require grazing management. In hay fields and grain fields, a strip of unmanaged hay or grain from 10–60 feet wide can be left adjacent to forests for summer brood rearing and winter food.

8. **Pasture management** may involve temporarily excluding cattle from edges to allow grasses to seed out for turkey brood rearing and fall-to-winter feeding. Overseeding and fertilizing pastures that need renovating, and the control of noxious weeds will improve turkey foraging habitat.

9. **Pasture enhancement**—In very large pastures or where numerous pastures form a treeless block (160 acres or more), windbreaks can be planted for escape cover and travel corridors and to supply additional foraging habitat. Windbreaks should be a minimum of three rows in width with some mast-producing shrubs included along the edges. Planted trees and shrubs should be protected from livestock at least until they are well established.

Modern forest, farm, and ranch management has altered many native environments. In this process, a new niche has been created that is rapidly being filled by wild turkey subspecies from other regions of the United States. With some understanding of their biological requirements, appropriate management of this new addition to our local fauna can allow wild turkeys to prosper for the enjoyment of landowners, wildlife observers, and sportsmen for generations to come.

Sources of Information



National Wild Turkey Federation—Wildlife bulletins. Visit www.NWTF.org.

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Hewitt, Oliver, ed. 1967. *The Wild Turkey and its Management*. The Wildlife Society. Washington D.C.

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A Woodland Fish and Wildlife Project Publication

By

Jim Bottorff, Washington Department of Natural Resources.

Valuable information and suggestions were provided by: *Steve Denney*, Oregon Department of Fish and Wildlife; *Dave Ware*, Washington Department of Fish and Wildlife; *Dr. John Crawford*, Oregon State University; and the National Wild Turkey Federation.

The Woodland Fish and Wildlife Project is a cooperative effort among the World Forestry Center, Oregon State Department of Forestry, Oregon Department of Fish and Wildlife, Washington State Department of Natural Resources, University of Washington College of Forest Resources, Oregon State University Extension Service, Washington State University Extension, Oregon Association of Conservation Districts, Oregon Small Woodlands Association, Washington Farm Forestry Association, Washington Department of Fish and Wildlife, USDA Natural Resources Conservation Service, USDA Forest Service, US Fish and Wildlife Service, and the Western Forestry and Conservation Association.

The Woodland Fish and Wildlife Project was initiated to provide information on fish and wildlife management to private woodland owners and managers. It is the intent of the organizations involved in this project to produce publications that will serve as practical guides to woodland owners.

Each publication is intended to be complete in itself. Users may find it convenient to collect all publications in this series in a three ring binder to form a permanent reference file. Woodland Fish and Wildlife Project publications range from an overview of fish and wildlife opportunities on woodland properties to specific publications concerning techniques for managing individual species.

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