



Woodland Fish and Wildlife

October 1988

Is there a place for Fish and Wildlife in your Woodland?

As an owner of a private woodland, you likely have observed many different kinds of wildlife (birds, mammals, snakes, amphibians) and perhaps fish, as well, on your property. One of your key interests in managing your woodland may be for fish and wildlife. If so, you probably have some questions. What are the potentials? What is needed for proper management of fish and wildlife? Is good management of fish and wildlife compatible with good timber management? Are there conflicts? Does managing for one mean getting less of the other? Are there legal restrictions for managing fish and wildlife? This circular will help answer these and other questions and direct you to additional sources of information.

What are the Potentials?

A traditional use of fish and wildlife is hunting and fishing.

These activities provide many hours of outdoor recreation and often produce tangible results such as meat on the table and trophies to hang on the wall. Many pleasurable intangibles result from hunting and fishing, too. These include escape from everyday job pressures and a screening from the noise of



Recreational fishing and hunting are popular activities on private woodlands; leasing of rights can produce income. (W.F.C. photo)

civilization, vigorous exercise in scenic surroundings, a degree of solitude or a campfire with friends, and just getting "closer to nature."

Much hunting and fishing is conducted on private woodlands by the owners, their families and friends strictly on a rec-

reational basis. However, a growing number of private woodland owners are recognizing, and realizing, additional income by leasing access rights to their property to private individuals or organizations for "fee" hunting and fishing.

Such income might be in the

(by David de Calesta and Millard S. Deussen)

form of exchange of services like posting and patrolling property boundaries by lessees for the privilege of hunting or fishing. Another form of exchange might be payment for packaged trips including bunkhouse, camp meals guide service, and processing of harvested fish or game. Landowners may receive payment for access only; or up to \$500-\$1000 per individual for guided fishing trips and \$5,000-\$10,000 for guided big game hunts.

Trapping wild animals for their fur is another activity with the potential for economic return to woodland owners. Special skills and equipment are required, as are licenses. Most fur trappers view this activity as a hobby because earnings usually barely cover operational costs.

Many woodland owners relate to fish and wildlife from strictly an aesthetic point of view. They simply like to view wild animals and provide a place for them in their woodlands, streams and ponds.

Bird-watching and related activities are rapidly gaining in popularity. Establishing bird feeders and houses, planting food crops and providing good natural habitat are typical activities, as is rising at dawn with friends to bird-watch.

Wildlife photography is another popular activity. Photography may be practiced by landowners and friends. Like hunting and fishing, it may also be a source of income from persons without ready access to wood-



Wildlife photography can be enjoyed by the landowner and friends and can be a source of income. (O.D.F.W. photo)

lands who pay for the opportunity to photograph wildlife.

Camping, hiking, canoeing and rafting are other outdoor activities practiced on woodlands. These activities often include hunting, fishing, bird-watching and/or photography as associated opportunities.

Basic Considerations

Fish and wildlife species have specific habitat requirements which include food, water, cover and space. These requirements differ for different species. Maintaining a large number of different species of fish and wildlife means maintaining a diversity of habitat types.

You may need to modify your expectations of returns from your woodlands when you incorporate managing for fish and wildlife.

Other natural resources on your woodlands, such as timber, water, and forage for do-

mestic livestock, have their own set of requirements. In some cases, managing for fish and wildlife may affect the income or other benefits you receive from managing these natural resources. For example, managing large numbers of deer for hunting may result in a population that is too crowded for available food resources. If you have a small woodland surrounded by pasture land you'd be unwise to try to encourage large herds of deer or large carnivores. The configuration of the general area and your property will affect the species you can, and will want to, encourage.

The harvest of fish and wildlife is regulated by law. So too, in some cases, is management of woodlands if it might have some detrimental effect on fish and wildlife. You should be aware of these legal considerations so that you will be able to

manage your natural resources, including fish and wildlife, in harmony with the law and your desires. Your state fish and wildlife agencies are good places to contact to learn more about these laws.

Most likely you have some objectives for the returns you expect from managing your natural resources including fish and wildlife. You need to list these objectives, specifically for each natural resource, and rank them in order of priority so that you can place management of fish and wildlife in the proper perspective. This is a crucial first step.

What Kinds of Fish and Wildlife?

There are literally hundreds of fish and wildlife species you could manage for on your woodland. Sorting out the ones you want to emphasize will make management much easier, and compromises with other natural resources less difficult.

If an objective is to manage



In many cases the harvest of forest products can improve habitat for wildlife. (W.F.C. photo)

woodlands for hunting, you need to decide which group or groups of animals will be emphasized. It could be deer and elk, or antelope, waterfowl (ducks and geese), upland game

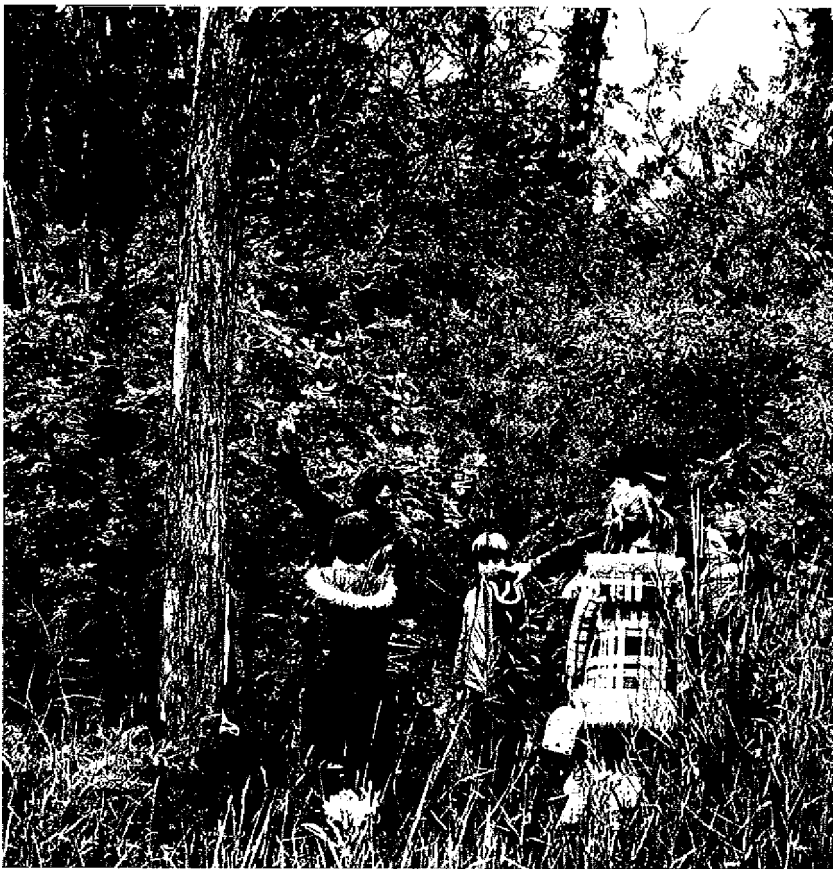
(pheasant, grouse, quail, rabbits, squirrels) or large predators (mountain lion and bear).

Sorting out the kind of natural habitat you have on your property is also important. It's easier to work with what you have to attract the creatures that do best there. This will influence your decision and ultimate success.

If your interest lies chiefly with fishing, you'll want to decide between anadromous fish (salmon, steelhead and sea run cutthroat), resident trout species, or warm water fish (bass, bluefills, catfish, perch). You'll want to decide whether to manage stream habitat or whether you have a suitable site for a pond. Streams are more



Some species such as the ruffed grouse live on a variety of habitats and can provide recreation both to the hunter and non-hunter. (O.D.F.W. photo)



Bird watching and other non-consumptive activities are rapidly gaining in popularity. (O.D.F.W. photo)

difficult to manage. Ponds, on the other hand, provide easier control and enable a separation of wild and privately owned fish.

For trapping, species of interest are the predators (weasel, mink, otter, badger, raccoon, coyote, bobcat, fox) and aquatic mammals (beaver, muskrat, nutria).

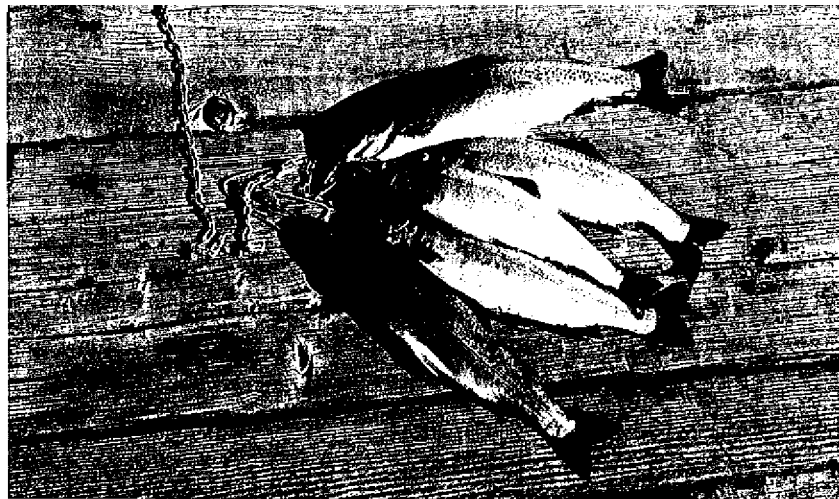
Bird-watching involves the whole bird community, but most interest is in raptors such as hawks and owls and in non-game songbirds.

There is also interest in other forms of non-game fish and wildlife such as small mammals, reptiles and amphibians. This appreciation for these groups of animals can lead to

habitat improvements and protection from environmental hazards imposed by man's activities. Most endangered and threatened fish and wildlife fall into the non-game category.

Some species of wildlife may become pests under certain conditions. For example, rodents such as meadow mice, pocket gopher, mountain beaver, wood rat, porcupine, and beaver may become problems if their populations become too large. Game animals such as deer, elk and bear may also become pests if not properly managed.

Management for these different categories of fish and wildlife reflect different philosophies and practices. For hunting and fishing, the objective usually is to produce as many animals in excellent condition, and in some cases trophy condition, as possible. Generally, this is achieved by optimizing the quality and quantity of habitat required by the desired species. For deer and elk, management includes harvesting enough animals each year so those remaining after harvest have adequate habitat to insure maximum reproduction and survival.



Ponds and streams on woodlands can be managed to produce trout and other cold water species or bass and other fish adapted to warmer waters. (O.D.F.W. photo)

Management for fur-bearing animals consists primarily of regulating harvest so that populations are not overexploited. In most cases, fur-bearing predators range over large areas of variable habitat, so managing habitat for them is not practical. Managing the food resource, which consists mainly of rodents, ground-dwelling birds and insects, for fur-bearing predators is neither practical nor necessary. Predators tend to regulate their own numbers, based in part on the presence and subsequent competition of others of their own species.

Aquatic fur-bearers are sensitive to manipulations of their environment, which consists of rivers, streams and ponds. Therefore, management for these animals can involve habitat manipulation. Food sources for aquatic fur-bearers include aquatic and streamside vegetation. These food sources can be managed for their benefit.

Non-game fish and wildlife form a tremendously diverse group, ranging from the small salamanders and frogs that dwell in streams and ponds to the spotted owl and flying squirrel that reside in old growth and mature timber stands. Because this group is so diverse, as are habitat requirements, managing for the greatest numbers of non-game animals will result in maximizing habitat types for many different species. Managing populations of non-game species is keyed to maintaining populations of sufficient size

so that they are self-perpetuating.

In some cases, management requires preservation of unique and rare habitats. In other cases, it requires creating widely differing habitats in close proximity to each other.

Management of identified pest species has as its objective controlling damage rather than controlling animals. Essentially, this boils down to either preventing pests from damaging woodland tree species by keeping the pests from gaining access to the trees through enclosures around individual trees or entire regeneration sites, or repelling them from damaging the trees. Other methods include altering habitats so it no longer provides for the basic needs of the pest animals or it provides preferred alternatives to the trees being damaged. Still another method may include reducing the pest populations to a point where damage becomes low enough to be tolerated.

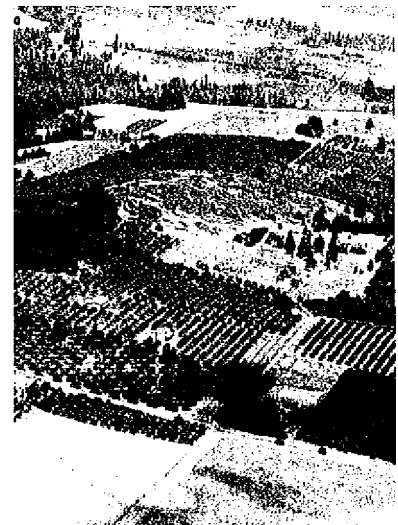
Meeting Habitat Needs

Much has been said about the need to meet habitat needs of the various groups of fish and wildlife. But what are these elements termed habitat?

Food -This requirement is obvious. What is not so obvious, however, is that there may be seasonal differences in the types of foods required by a species and seasonal patterns of amounts and quality of food required. Also, sources of food

must be located close enough to other parts of required habitat or fish and wildlife will be unable to utilize the food source.

Cover -Cover is another important component of habitat. Cover is that part of the physical and vegetation environment that fish and wildlife utilize to protect themselves. Thermal cover allows animals to avoid extreme heat loss in cold environments and extreme heat gain in hot environments. Hiding cover provides protection from predators and nesting cover protects eggs and young. Cover could be a hole in a snag, a crevice in a rocky outcropping, or a dense stand of second growth timber. Cover needs, like food requirements, vary among wildlife species.



An important dimension of habitat is the size and arrangement of blocks of food and shelter. (O.D.F.W. photo)

Water -Obviously, water is another essential for fish and wildlife. For fish and aquatic wildlife, waterways and ponds provide thermal, hiding, and

nesting or spawning cover as well as supporting their food. Water also is essential in the bodily reactions of all fish and wildlife. They cannot live for long without it and will not exist in habitats that cannot provide a year round supply of water.

Certain fish and wildlife species have unique habitat needs that are likely to be missing or altered as a result of man's management of forests. For example, a number of bird and mammal species nest in and seek protection from weather and predators in cavities in snags. These cavities are produced by woodpeckers and flickers generally in trees that



Certain species of wildlife have unique habitat needs such as cavities in snags. (W.D.W. photo)

are sufficiently damaged to have some degree of heart rot. Some cavity-nesting wildlife are found only in openings in forests. Thus, there is the need for snags with cavities in all these stages of forest succession. In many cases, past forest management called for cutting all snags to prevent lightning strikes from starting fires, to reduce the rate of fire spread, and to avoid hazard to loggers and tree planters from falling limbs and whole snags. While some snag removal is essential, extensive cutting eliminated a key habitat component for a significant segment of the wildlife community.

There is also a special need for down and dead woody material on the forest floor and in streams. Large organic debris (LOD), which includes tree trunks and branches, provides hiding cover for fish and aquatic mammals. LOD also provides hiding and thermal cover for terrestrial wildlife. Down and dead woody material also harbors insects that are important food resources for some fish and wildlife species.

Old growth forests and riparian zones, the band of vegetation surrounding bodies of water, represent a more complex form of habitat. They form continuous blocks of special habitats that are needed by certain species to meet food and cover needs. As with other special needs, old growth forests and riparian zones represent habitat components that in the past in many cases were

sometimes eliminated or modified by typical forest management practices.

A last and very important dimension of the habitat needs of fish and wildlife is the size and arrangement in space of blocks of food sources and cover types. There are minimal sizes of food source and cover type blocks needed for each fish and wildlife species. Drop below these minimum sizes and there aren't enough of the essential elements needed to allow a species to exist in a locale.

These food source, water source, and cover type blocks must also be sufficiently close to permit the fish and wildlife species to travel from one to the other without undue exposure to weather extremes or predators. Unless these minimum distances are met it is as if the essential habitat requirements didn't exist, and the fish and wildlife species won't either.

Fish and Wildlife Communities

A forest progresses through the process called plant succession as it moves from open land created by fire, insect or disease infestation, windthrow and/or clearcut logging. This progression moves from the open land to the grass-forb stage, to the shrub stage, to the seedling/sapling stage, to the young forest stage, and finally to the mature and old growth forest stage.

Each of these stages, called

seral stages or seres, is characterized by a typical community of plant species. For each of these plant communities, there is an associated fish and wildlife community composed of animals that have evolved to utilize the food and cover found there. A given wildlife species may find its food and cover needs in a combination of plant communities, or in a single community.

The important fact to gather from this discussion of communities is that the greater the diversity of plant communities (or seral stages) the greater will be the diversity (number of different species) of fish and wildlife, and the greater the chance that the species you may choose to manage for will have the potential for existing on your woodland. So, too, for that matter, will be the potential for the existence of pest wildlife species.

Got What it Takes?

Once you have identified the fish and wildlife species you wish to manage, you need to determine the potential your woodland holds for these species. This calls for an inventory of existing or potential habitats, size of habitat blocks, and location of habitats relative to other blocks.

The inventory process is fairly simple. Draw a line around the boundary of your woodland and then identify and label your various seral stages, tree species, special habitat types (es-

pecially riparian zones), and prominent terrain features such as ridgelines, draws, roads, and buildings. Estimate areas for each seral stage and special habitat type. Note distances between seral stages, both adjacent and non-adjacent.

Aerial maps and photos are a



Aerial maps and photos are valuable tools in creating wildlife management plans. Cover and food types on adjacent lands must also be considered to better assure success. (O.D.F.W. photo)

pecial aid for accurately portraying and inventorying your woodland. The local State Forestry office, County Extension office or Soil Conservation Service office are good sources of maps and photos.

Individual ownerships often are rather small and may possess a limited number of seral stages. The associated fish and wildlife communities may thus be limited. Your woodland may

border other private woodlands whose owners may have fish and wildlife interests similar to yours. By combining management of adjacent woodlands, you can greatly expand the range of opportunities for fish and wildlife management and enjoyment. Inventory of sev-

eral ownerships is no more complicated than for single ownerships. By sharing expenses it may be economical to hire a professional to inventory your joint holdings.

Management for Fish and/or Wildlife

Once you have determined the fish and wildlife species you wish to manage, and that your

woodland is capable of providing required food and habitat, you are ready to apply certain management tools to achieve your goals. The primary tool is manipulation of habitat. By this process you maximize, to the extent you are capable, the potential number and condition of the selected fish and wildlife species.

Most game and non-game

such that they are adjacent to other cover types required by your chosen wildlife species.

Manipulating forests to provide for cover is more difficult. This usually requires stands of trees older than what you may have. It takes decades to produce mature timber, so for species requiring this type of cover you must already have mature trees and be willing to maintain

for selected wildlife species. Selective harvest methods are also important. By harvesting individual trees from a stand, openings are provided in the tree canopy, and more sunlight reaches the soil encouraging the growth of plants that provide forage for wildlife.

Some special fish and wildlife needs can be managed for or created. If you don't have snags, a short-term solution is to erect nest boxes of varying sizes on trees or poles placed in clearcuts. Snags can be created for the future by dynamiting or sawing the tops off of live trees 20-30 feet high. They will develop rot and attract woodpeckers within a fairly reasonable time.

Management of the stream bank and the stream channel to improve fish habitat can be done by careful placement of logs and boulders. Regulations limit such work to activities approved by the State Fish and Wildlife Agencies. Usually the best way to improve fish habitat in streams is to protect them from damage from logging and roads and from livestock grazing. Regeneration and growth of native vegetation will provide the hiding cover, spawning cover, and food organisms fish need.

Riparian zones can be protected by not cutting some or any of the streamside forest and avoiding road construction and other activities that may disturb these areas. State regulations governing management of timber in riparian zones provide



Installation of artificial nest boxes can increase populations of many birds and some small animals. (W.D.W. photo)

wildlife are herbivores or plant eaters. You can enhance food resources by planting forage species identified as meeting specific wildlife needs. Simply creating openings in woodlands provides the stimulus for natural growth of many grasses and forbs preferred by game and non-game wildlife. Placement of forage plantings or forest openings should be planned

them. This will mean forgoing harvest of at least some market-sized trees and the income this harvest would generate.

However, for species that require the earlier grass/forb and shrub seral stages, harvest of mature timber opens land for their development. Managing the size and location of clearcuts will allow you to maximize potential of habitat development

directives for the protection of these areas. Riparian zones overgrazed by cattle can be fenced to control the level of grazing, thus allowing riparian vegetation to regenerate. These practices may require forgoing some economic return from use of other natural resources.

To a limited extent, you can manage some wildlife populations by manipulating their numbers. If you are managing for game species, you will be attempting to provide habitat that encourages these species to reproduce at their maximum rates. You also will be wanting to harvest surpluses of animals to maintain the population at or below the carrying capacity of your habitat.

This may sound contradictory, but it isn't. Most game species tend to over populate,

and they will if habitat conditions provide them with good food and cover. These populations have evolved to produce excesses of young in favorable habitat conditions. The surpluses are taken by predators or lose out in competition for limited resources in winter "pinch" periods. Hunting is designed to remove the surplus number of animals resulting from optimum reproduction under favorable habitat conditions.

The difficult part is estimating the potential surplus and arranging for hunting to remove it. In some cases it is difficult to remove enough animals since members of both sexes must be harvested. Laws relating to legal harvest of game species are set by state game agencies, and may not allow you to

achieve your target harvest level.

Fish and wildlife cannot be stockpiled. The trout in your pond or stream and the grouse and deer in the adjacent woodland will be thinned by natural mortality in spite of your best efforts to provide for their needs. Harvest of some of the fish and game animals provides a means to maintain a stable population while putting the harvested animals to a good use. This is similar to the selective harvest of trees to provide for a better stand in the long run.

What Will It Cost?

A major expense of fish and wildlife management will be for habitat manipulation. Another major expense will be "opportunity costs" which is the



If woodlands are to be managed for hunting, the woodland owner must decide what group of wildlife species is to be emphasized. (O.D.F.W.)

income from other natural resources forgone to provide for the needs of fish and wildlife. You will have to determine these expenses based on the effort, and funds, you provide for habitat manipulation and your own opportunity costs. Fee hunting and fishing operations may help provide economic offsets to opportunity costs.

You may be eligible for some economic incentives for fish and wildlife management. If you set aside lands previously cultivated for agricultural crops, and plant them to wildlife forage and/or trees, which may later be harvested for profit, you may be eligible for incentives under the U.S. Department of Agriculture's "Conservation Reserve Program".

The Bonneville Power Authority has funds allocated to assist landowners in rehabilitating riparian zones, including fencing, in waterways that support anadromous fish and are part of the Columbia River system. Tax credits for riparian management are also available to qualified landowners in Oregon.

Where to Get Help?

Fortunately, there are many sources of useful information. Your county Extension office is a good place to start, as are county Soil Conservation Service offices and State Forestry offices. State fish and wildlife agencies, the U.S. Fish and Wildlife Service, the Bureau of Land Management, and land



Big game as well as other animals may become pests if numbers are not controlled. Habitat manipulation may help alleviate damage problems. (W.D.W. photo)

grant universities all have fish and wildlife specialists who can give expert advice. The references listed at the end of this circular are sources of general fish and wildlife management information.

This circular is designed to introduce you to concepts of management for fish and wildlife on private woodlands. It cannot begin to cover all the bases for all the potential fish and wildlife species in all of the varying habitats of eastern and western Oregon and Washington. These informational needs will be met by a series of more specific circulars.

The first set of circulars will define basic habitat in eastern and western Oregon and Washington and associated wildlife communities. These will help you to determine the potential fish and wildlife species you

can work with on your woodlands.

The circulars will define tree species composition, vegetative structure, identify potential natural resources that can be managed with fish and wildlife resources, identify potential opportunities and areas of conflict with other natural resource use, and include references. Examples of some habitat types that will be covered are riparian, deciduous hardwood, ponderosa pine, and mixed conifer.

A second grouping of circulars will be for individual species or groups of fish and wildlife species. These circulars will detail essential life histories and geographic distribution, habitat needs, habitat and population management, areas of conflict with other natural resources and references.

Useful References

General Fish and Wildlife Management

Brown, R.E. (editor). 1985. Management of Wildlife and Fish Habitats in Forests of Western Oregon and Washington. U.S.D.A. Forest Service, 332pp.

Thomas, J.W. (editor). 1979. Wildlife Habitats in Managed Forests the Blue Mountains of Oregon and Washington. U.S.D.A. For. Ser. Handbk. No. 553, 519pp.

Wildlife Management on Woodlots

Gutierrez, R.J., D.J. Decker, R.A. Howard, and J.P. Lassoie. 1984. Managing Small Woodlands for Wildlife. New York State Ext. Svc. Inf. Bull. 157 Ithaca. 32pp.

Craven, S. 1981. Wisconsin Woodlands: Wildlife Management. Wisconsin Ext. Svc. Publ. G3097 Madison. 8pp.

Decker, D.D., and J.W. Kelley. Enhancement of Wildlife Habitat on Private Lands. New York State Ext. Svc. Ithaca. Inf. Bull. 181. 40pp.

Decker, D.D., J.W. Kelley, T.W. Seamans, and R.R. Roth. Wildlife and Timber from Private Lands: a Landowner's Guide to Planning. New York State Ext. Svc. Ithaca. Inf. Bull. 193. 56pp.

deCalesta, D.S. 1983. Enhancing Wildlife on Private Woodlands. Oregon State Extension Svc. Corvallis. Ext. Circ. 1122. 6pp.

Fazio F.R. 1985. The Woodland Steward. Woodland Press, Moscow, ID. 211 pp.



Forest management and fish and wildlife management are compatible activities that can be combined to provide increased benefits for woodland owners. (W.F.C. photo)

Our Purpose...

This publication was written by David de Calesta, Extension Wildlife Specialist, Oregon State University with the assistance of Millard S. Deusen, Fisheries Biologist, Washington State Department of Fisheries. The graphic design was done by Gail Saunders of the U.S.D.A. Forest Service and Christina Austin of the World Forestry Center.

The Woodland Fish and Wildlife Project is a cooperative effort among the World Forestry Center, Oregon State Department of Forestry, Washington State Department of Natural Resources, Oregon State University Extension Service, Washington State University Cooperative Extension, University of Washington

Center for Streamside Studies, Oregon Association of Conservation Districts, Oregon Small Woodlands Association, Washington Farm Forestry Association, Oregon Department of Fish and Wildlife, Washington Department of Fisheries, Washington Department of Wildlife, Oregon Soil Conservation Service, Washington Soil Conservation Service and USDA Forest Service. The World Forestry Center serves as the coordinating organization for the project.

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.

These publications can be obtained from any of the cooperating organizations or by contacting the **World Forestry Center**, 4033 SW Canyon Road, Portland, OR, 97221, (503) 228-1367.

World Forestry Center
4033 S.W. Canyon Road
Portland, Oregon 97221
(503) 228-1367

Nonprofit Org. U.S. Postage PAID Portland, Oregon Permit No. 1386
--