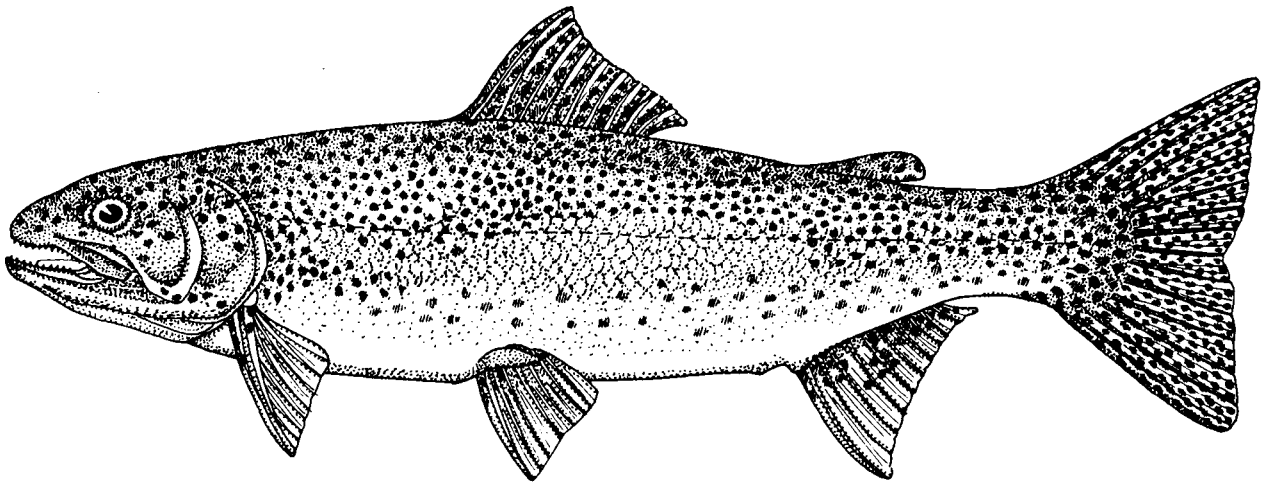




Woodland Fish and Wildlife

Trout In Small Woodland Areas



Rainbow Trout (Oncorhynchus mykiss)

Your woodland stream or privately owned pond may not only provide

good fishing, but can also become the central point for many other forms of recreation such as boating, swimming, sun bathing, picnicking and nature observation. Some landowners are increasing their income by providing trout fishing and related outdoor recreation opportunities for a fee.

This leaflet is designed to give some general ideas on raising trout on your woodlands.

Publications are available with detailed information on pond construction, stream enhancement and trout management. In Oregon and Wash

ington you will probably need a permit to do any work in streams. For information and permit sources see the reference section at the end of this leaflet. We hope this brief publication will help you decide whether you want to try to get into trout raising.

The amount of dissolved oxygen and the temperature of the water is critical for trout survival. Be sure to read all of the section concerning these factors before going very far in getting trout stocks.

Species

Rainbow trout are most commonly selected for farm pond stocking in the Northwest

because they are the most readily available species and are the most resistant to disease. Also, rainbow trout do the best in the small pond environment. Lists of trout farms where fish may be purchased can be obtained from your state fishery agencies.

Native cutthroat, brook trout or brown trout may do well in some ponds. Cutthroat trout grow more slowly than rainbows and brook trout generally have lowest survival in most farm ponds. Brooks are a little easier to catch than rainbows and will sometimes spawn in small springs or trickles of water that rainbows will not use. In appropriate waters, rainbow and

brook trout are sometimes stocked in the same pond for variety.

Cutthroat trout have been little used in farm ponds and are not widely available from hatcheries. Brown trout are longer lived and will grow larger in many ponds, but they tend to be more cannibalistic and are considerably harder to catch than the other species.

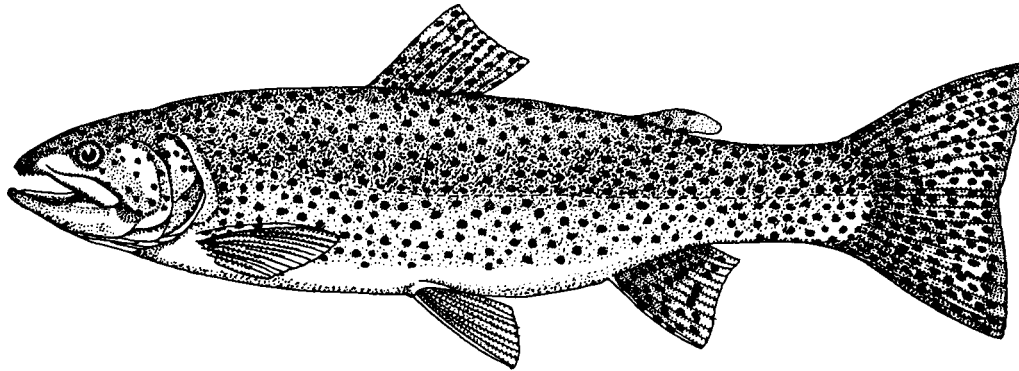
The introduction of nonnative or exotic species of fish is closely controlled in both states. A permit is necessary to transport fish from one body of water to another and in most cases exotics from other areas are not permitted. This is necessary to control the spread of disease and to keep out foreign fish that would compete with the species already found in our states.

been fished heavily or not unless additional stocking has taken place. A growing, immature trout is a prime fish for eating. Growth rates of 1 to 1.5 inches per month may be realized in productive waters.

Longevity for artificially stocked brook and brown trout is normally about one year longer than that for rainbows. Neither of these species grows as rapidly or is as disease resistant as the rainbow trout. Brook trout seem to grow especially slow in low elevation farm ponds.

peratures each day especially if they have cooler, deeper waters to retreat to. In Northwest ponds, July and August are critical months. At this time of the year water temperature is at the warmest and oxygen supplies are likely to be low or lacking in the deeper, cooler areas of the pond because the water tends to layer or stratify.

Regardless of elevation and location, ponds fed by cold springs or wells may be suitable for trout. Some such water sources may have problems with essential chemicals. The water must have at least 5 parts



Cutthroat Trout (Onchorynchus clarki)

Life History

Artificially stocked rainbow trout will live for about three summers and two winters in most farm ponds. Unless good spawning conditions are available, it is best to fish trout out of the ponds in the three summer-two winter period of time before they die. After that time, there will be few trout left in most ponds whether they have

Habitat

Trout can survive in water between 33 and 70 degrees F, but grow most rapidly in water that is 50 to 65 degrees F and are less susceptible to parasites and diseases at these temperatures. Trout die if the water reaches 86 degrees F. Trout may survive a few hours of exposure to high surface tem

per million of dissolved oxygen and moderate alkalinity with a pH between 6.5 and 9. Water that is slightly alkaline is best. A simple test kit is available to measure these values or your local biologist can assist you. Check with your local fish or wildlife department office to find out where to get such kits.

Pond Management

There are a number of publications available on pond construction. This brochure is designed to give basic information on trout that can be used in new or existing ponds.

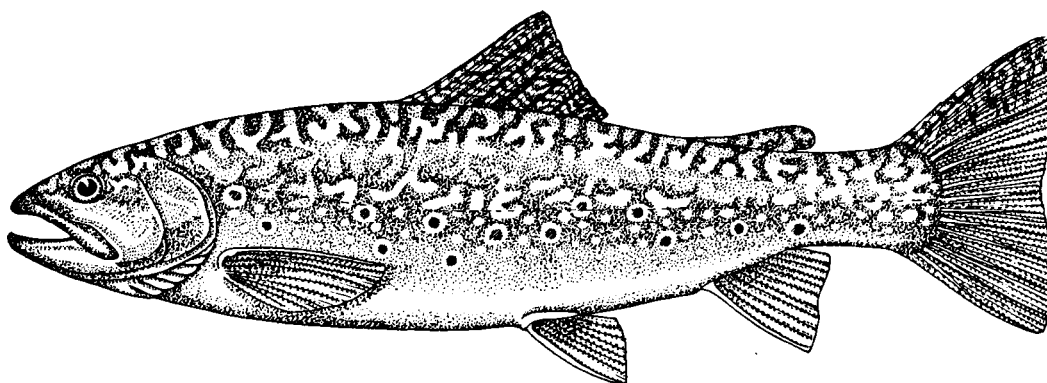
ment plans:

(1) Stock only the number of fish that can be supported by the natural food supply. This calls for no artificial feeding. Crayfish, a very desirable fish food usually find their way into

eating birds such as herons, kingfishers and mergansers. In addition, sunken escape refuges such as small pipes and screened areas or slotted boxes with entries big enough for the fish, but too small for otters to

enter are worthwhile additions.

If a pond is mostly out in the open, thought should be given to planting of trees along the south and west sides to shade the water and keep it cooler. Such plantings also are a source of insect food for the fish.



Brook Trout (*Salvelinus fontinalis*)

The kind to stock, population and growth of fish depends on pond size, surrounding soil, incoming water supply, depth, maximum temperature, vegetation, shade, sunlight, water clarity, water level fluctuation, artificial feeding and methods of harvesting the fish. The total length of the growing season in your pond is also important in determining the size and number of fish you can raise.

Ponds with surface acreage of one-fourth acre to several acres can be managed for good fish production. Ponds of less than two acres are popular because they are less difficult to manage than larger ones.

There are two basic manage-

ment plans. Fresh water shrimp are also excellent trout food.

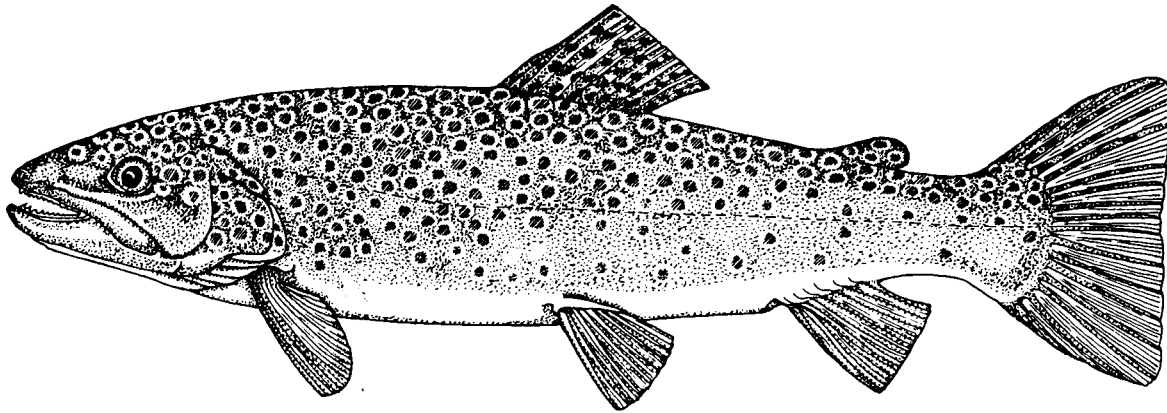
(2) Stock the pond more heavily and supplement the natural food supply with artificially prepared trout food. Commercial food is available at most feed and seed stores.

Generally, ponds that are steep sided with limited amounts of adjacent plants and little algae growth may require artificial feeding.

In constructing ponds, thought should be given to providing hiding cover for the fish. Floats, fallen logs and vegetation along the edge and sunken materials will give the trout a place to escape from fish

The proper rate of stocking and necessary feeding will vary with each pond. Consultation with your local fishery department biologist will help you determine the answers to these questions.

Prior to stocking and during the first couple of years following the construction of a new pond it is well to take water temperatures during the summer. Temperatures at the surface and about six feet down are important to know, especially during the hotter part of the summer. In addition, checks of the amount of dissolved oxygen in the water are important. This information may save many dollars spent



Brown Trout (Salmo trutta)

trying to grow trout in waters unsuited for them.

Aeration of the pond waters may be necessary during the heat of the summer. Also, in areas where the ponds freeze and become covered with snow, it may be necessary to aerate the water in the winter. Just because a pond is fed by springs, it does not mean it has enough oxygen. Spring water is often very low or lacking in dissolved oxygen.

Stream Trout Populations

Manipulating trout populations in streams is more complex than working in ponds. Actual stocking of trout in streams is usually impractical and may be illegal. There are numerous restrictions concerning habitat modifications in streams, especially those containing migratory fish. Changing of stream patterns by placing of rocks and logs in the stream, deepening of holes and redirecting stream flows all may pro-

duce better trout habitat, however before attempting stream changes a fishery biologist should be consulted and the appropriate state agency contacted concerning necessary permits. People from the agencies or private consulting biologists can advise you as to the best activities for improving your stream habitat.

Rainbow trout are either native or have been stocked into most areas of Washington and Oregon. Cutthroat are native to the west sides of both states and have been introduced in the eastern portions. Brook trout have been stocked into many high lakes and some have moved downstream. The brown trout has been stocked in lakes and streams in the Cascades and eastward.

Most rainbow and cutthroat spawn in the spring of the year while most brooks and browns spawn in the autumn. The majority of trout in streams mature at age 3 at various

lengths. The size of maturing fish depends greatly upon the habitat in which they are living. Cutthroat have a rather complex life history and in the streams where there is access to the ocean, there may be migratory forms of both cutthroat and rainbow.

Growth of trout depends on the geographic area, water temperature, water fertility and a variety of lesser factors. Fish east of the Cascades are typically larger (at a given age) than those from the west side. All species are opportunistic feeders - taking everything from aquatic insects to other fish - and much of their diet depends upon what happens to be available at the particular time of the year.

Management Problems

Two major management problems can arise in raising trout.

- (1) Treatment of the areas
-

above the trout waters. Chemical and erosion runoff from these areas can detrimentally impact trout waters. Maintenance of healthy riparian areas and minimization of erosion and pollution in upper watershed areas help minimize these problems.

(2) Management of the instream and riparian area. Wild trout are a product of their environment and destruction of stream habitat impacts populations. Riparian areas have an important effect on the water in ponds and streams. A separate leaflet concerning the value of riparian areas is available from the World Forestry Center. These areas can have a major

impact on the waters of a stream or pond and should be carefully considered when managing for trout.

Though not directly related to fish management, the creation of a pond can have other consequences. If you are in a populated area you may acquire a liability by creating an attractive nuisance. This may demand fencing of the pond and posting it. Locating the pond away from easy public access and out of sight from nearby roads may help lessen the problem of trespass. Walkways out into the pond and floating craft on it are additional magnets to uninvited users.

Checklist Of Essentials For Suitable Trout Water

1. Site free of sewage, excess sediment and other pollutants.
2. Site free from heavy runoff or flooding
3. Soil that holds water without excessive seepage
4. Dependable quantity of water
5. Proper quality of water
 - a. Best temperature 50 to 65 degrees F.
 - b. Dissolved oxygen minimum 5 ppm
 - c. Alkalinity pH of 6 to 8
6. Streamside vegetation
7. Mixture of pools and riffles in streams
8. Spawning gravel in streams

If you find that some of the essential habitat components found in the checklist are missing from your stream or pond, contact your local fish or wildlife agency for advice.

References

Oregon Department of Fish and Wildlife, Portland or regional offices.

Washington Department of Wildlife, Olympia or regional offices.

Washington Department of Fisheries, Olympia or local offices.

U.S. Soil Conservation Service.

Publications

Aquaculture Magazine. "Carrying Capacity and the Trout Farmer" Nov/Dec, 1982. 3 pp.

Greenberg, D. TROUT FARMING. Chilton Company. Book Division, Philadelphia, PA. 1960 197 pp.

Landforce, A. MANAGING OREGON TROUT PONDS. Oregon State University Agricultural Extension Bulletin 729. 8pp.

Marriage, L.D., Borell, A.E. and Scheffer, P.M. TROUT PONDS FOR RECREATION. U.S. Government Printing Office: 1977 0-247-965. 13 pp.

U.S. Department of Agriculture. PONDS - PLANNING, DESIGN, CONSTRUCTION. Agriculture Handbook Number 590. 14 pp.

Woodland Fish and Wildlife Group: RIPARIAN AREAS; FISH AND WILDLIFE HAVENS. World Forestry Center June 1989. 8 pp.

Our Purpose...

This leaflet was written by Jim Griggs, staff biologist with the Oregon Department of Fish and Wildlife.

The Woodland Fish and Wildlife Project is a cooperative effort among the World Forestry Center, Western Forestry & Conservation Association, Oregon State Department of Forestry, Washington Department of Natural Resources, Oregon State University Extension Service, Washington State University Cooperative Extension, University of Washington Center of Streamside Studies, Oregon Association of Conservation Districts, Oregon Small Woodlands Association, Washington Farm Forestry Association, Oregon Department of Fish and Wildlife, Washington De-

partment of Fish and Wildlife, Oregon Soil Conservation Service, Washington Soil Conservation Services, USDA Forest Service and USDA Natural Resources Conservation Service.

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 may be ordered from the Oregon State University Extension Service at (541) 737-2513 or the Washington State University Cooperative Extension, at (800) 723-1763. Electronic copies are also available over the Internet at:

www.dfw.state.or.us/woodland.html

6/97

Reprinting of this publication, in whole or in part, is allowed with written permission of Woodland Fish and Wildlife.

RHH 6/97

Woodland Fish & Wildlife
4033 SW Canyon Road
Portland, Oregon, 97221