



## FISH

Status: Common in Black Hills, Introduced

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# RAINBOW TROUT

(*Oncorhynchus mykiss*)

## Description

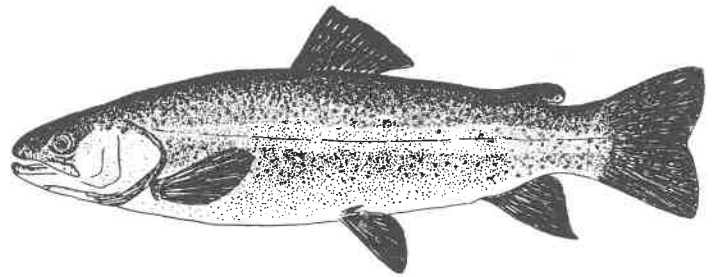
Rainbow trout have very small, fine scales on their torpedo-shaped body. They have silvery sides with a horizontal pinkish band that varies in intensity in different populations. The back is bluish to greenish with black spots on the back and sides. Rainbows have no teeth on the tongue. Rainbow trout belong to the family of fish known as salmon and are characterized by *adipose fins* and by an *axillary process* at the base of each *pelvic fin*. The *caudal fin* is not forked, and has radiating rows of black spots. There are more than a hundred varieties of rainbow trout, but only three subspecies: the common rainbow; steelhead (or coastal rainbow); and Kamloops rainbow.

Rainbows may live up to 11 years, but the usual life span is four to six years. Growth is highly variable, depending on the habitat. A typical stream-dwelling rainbow grows to weigh about 1 pound (0.5 kg) in four years.

## Distribution

Rainbow trout are native only to the Pacific slope of North America, but have been widely introduced on every continent, except Antarctica.

Rainbow trout prefer cool, clear streams and lakes, but can survive in lakes or ponds on the prairie, as long as there is cool, oxygenated water in the depths.



Rainbows prefer water from 55° to 60°F, and will tolerate temperatures up to 75° F. Rainbow trout are stocked in Black Hills area lakes and are also found in a few streams. *Fingerling* rainbows are stocked in some spring fed ponds on the prairie. Most South Dakota lakes and streams do not presently have suitable conditions for natural reproduction of rainbows. Thus, SD Game, Fish and Parks stock hatchery-raised fish to provide the trout fishery.

## Natural History

The diet consists mainly of immature and adult insects, plankton, crustaceans, fish eggs, and small fishes. Rainbows consume far fewer fish than do brown trout.

In the wild, most varieties of rainbows spawn in the spring, however, spawning may occur anytime of the year. Spawning takes place in small tributaries, often at

the inlet or outlet of a lake, where water temperatures reach 50° to 60°F (10-16°C). The spawning site is usually the tail of a pool, or the *riffle* at the head of a pool, where gravel bars have ample oxygen-rich water, and no suffocating silt. Before spawning, males undergo astounding anatomical changes. A male's jaws lengthen and the lower jaw develops a *kype*. All fish become darker when in spawning condition. Their spots become more prominent and the pink stripe more intense.

The female digs several *redds* for depositing the eggs. She turns on her side and beats her tail against the bottom, moving the gravel away to create a depression longer than her body and about half as deep. As the female digs, she is often accompanied by more than one male. The largest male is dominant and defends his territory by charging the smaller ones, using his *kype* to nip them. The male and female lie side by side and release *milt* and eggs. Sometimes the other males also deposit *milt* in the *redd*.

As spawning proceeds, successive groups of fertilized eggs are covered by gravel washed from the upstream edge of the *redd* by the females vigorous digging. The completed *redd* consists of many layers of eggs and clean gravel. When all the spawning activity is complete, the parents abandon the *redd*. Trout eggs range from 0.08 to 0.2 inches in diameter (2-5mm), and a 10-pound (4.5 kg) rainbow deposits about 4,000 eggs. A walleye of the same size deposits about 200,000. Eggs incubate from one to five months depending on trout subspecies and water temperature. This long incubation period subjects the eggs to many hazards, such as disease, drought and flooding. Eggs that are not well-buried are quickly eaten by predators such as crayfish, insects and fish, including trout.

The eggs hatch in the gravel, and at first the *sac-fry*, 3/4" to 1" (20-25mm) long can move very little. They do not feed, but absorb nutrients from the attached

yolk sac. After several weeks, they wiggle through the gravel and emerge into the stream. After the *fry* absorb the yolk sac, they begin feeding on plankton.

As the fish grow, they develop *parr* marks on their sides. At this stage, the fish are called *parr*. Rainbow trout lose their *parr* marks as they mature. Predation is severe during a trout's early life. Kingfishers, herons, and other fishes take the greatest toll. Usually, fewer than one percent of the newly hatched *fry* survive their first year.

## Management Considerations

In 1896, the U.S. Commission of Fisheries introduced rainbow trout into South Dakota. Black Hills streams received 11,900 *fingerling*-sized fish that first year. The rainbow trout fishery in South Dakota is known as a hatchery-sustained put-and-take. In other words, the population would be negligible or non-existent without stocking. A put-and-take fishery is characterized by rapid catching of stocked fish that have not grown appreciably since stocking. Generally, these areas are stocked with "catchable" size fish.

Rainbow trout were stocked into Oahe Reservoir and its tailwaters to add diversity to that coldwater fishery. In Oahe, the rainbows prefer temperatures of 55° to 60° F (13-16°C). That is the temperature found at about a depth of 30 feet (9 m). Chinook salmon prefer cooler temperatures and are found much deeper, at around 80 feet (24 m). Tailwaters of Lake Oahe maintain suitable temperatures and oxygen levels for trout growth and year around survival, but lack suitable spawning or nursery habitat for natural reproduction. This area is stocked as a put-grow-and-take fishery, which relies on stocking of fingerlings that will have a chance to grow in the cold nutrient-rich tailwater releases.

Decisions on whether to stock or not to stock are based on information collected and analyzed by fishery biologists. In many places in the Black Hills, where there are good populations of wild trout, hatchery trout are not stocked. Anglers who prefer catching wild trout often worry that undue emphasis on trout in the creel and on stocking programs, will

result in the neglect of natural resources. Biologists and fishery managers understand the value of wild trout and of the habitat that supports them. Efforts are being made by fishery managers to improve habitat so more wild trout can be produced, and fewer fish will be raised in hatcheries.

### Glossary

**Adipose fin** - a small fleshy appendage located behind the main dorsal fin.

**Axillary process** - a sharp ray extending from the fin.

**Catchable** - a fish that is 8-10 inches (20cm-25.4cm) long.

**Caudal fin** - the tail fin of a fish.

**Fingerling** - the stage in a fish's life between 1 inch and the length at 1 year of age.

**Fry** - small juvenile fish, usually smaller than 3" long.

**Milt** - white milky fluid containing sperm.

**Kype** - large hook shape on lower jaw of spawning male trout.

**Parr** - life stage of salmonid fish that extends from the time feeding begins until the fish become sufficiently pigmented to obliterate the parr marks, usually ending during the first year.

**Parr mark** - one of the vertical color bars found on young salmonids.

**Pelvic fins** - the paired fins corresponding to the posterior limbs of the higher vertebrates, located below or behind the pectoral fins.

**Redd** - area of stream or lake bottom excavated by a female trout during spawning.

**Riffle** - an area of shallow, rapidly flowing, choppy water in a stream.

### References

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Parker, Steve, 1988. Pond & River Eyewitness Books.

Sternberg, Dick, 1988. Trout. The Hunting & Fishing Library.

Sternberg, Dick, 1987. Freshwater Gamefish of North America. The Hunting & Fishing Library.

Stolz, Judith and Judith Schnell, 1991. The Wildlife Series - Trout.

Zim, Herbert S. Ph.D and Hurst H. Shoemaker, Ph.D. A Golden Guide- Fishes.

### Selected Resources for Teachers

*The Way of a Trout*, A film for loan from the S.D. State Library, S.D. Curriculum Center. 1969.

*How to Know the Freshwater Fishes* by Samuel Eddy and James Underhill. This is a pictured key to identification.

*Pond and River*, by Steve Parker. Eyewitness Books.

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