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1992 Fall Compendium of Wildlife Appreciation Opportunities

Colorado's Wildlife Company

COLORADO DIVISION OF WILDLIFE



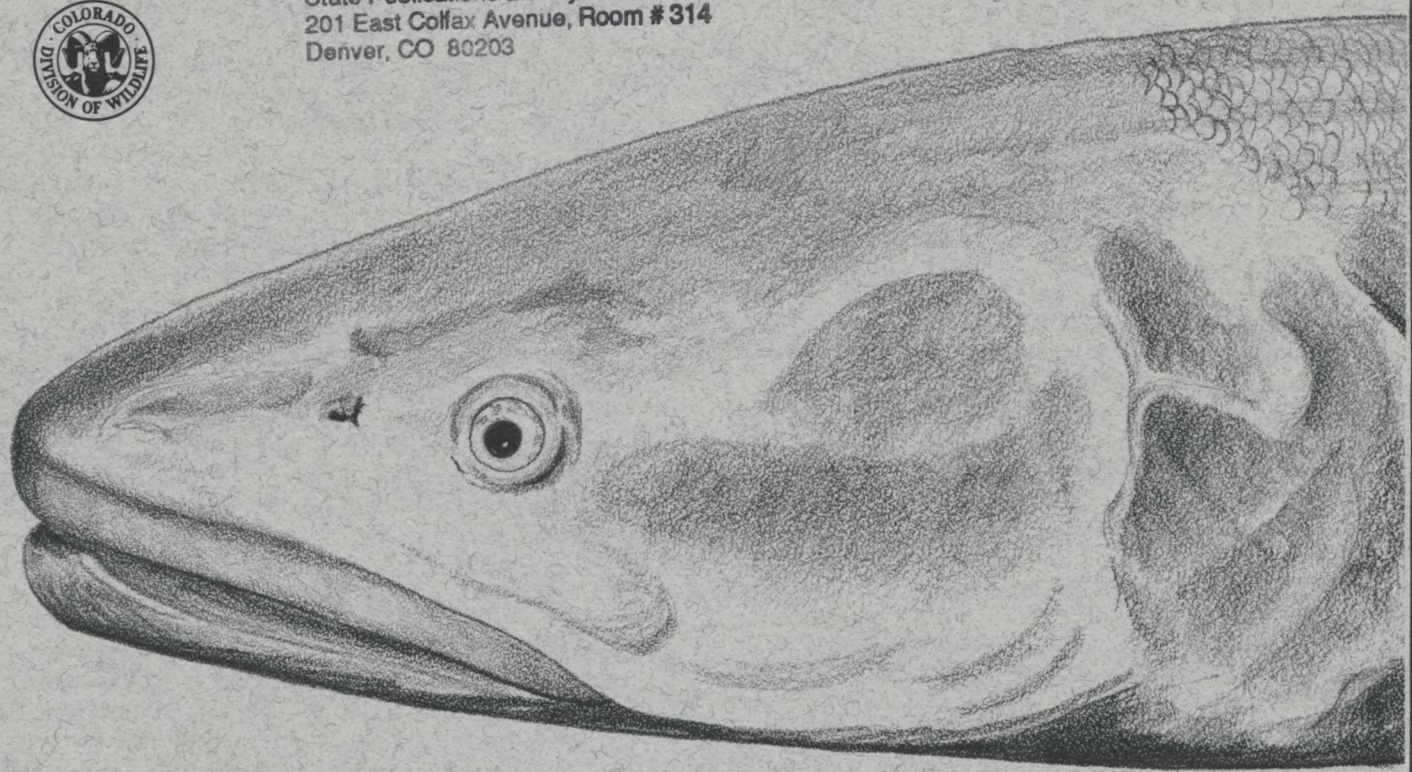
Nongame and Endangered
Wildlife Program



Watchable Wildlife Program

Return Of The Natives

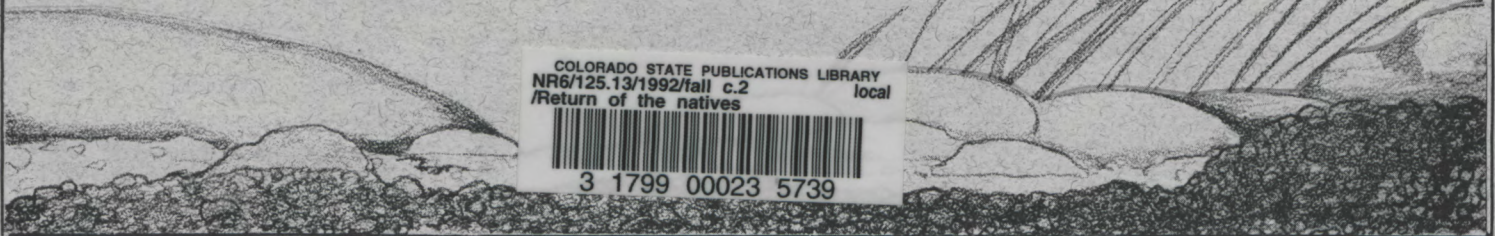
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Colorado squawfish (up to 6 feet long)



speckled dace (4.5 inches)



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/Return of the natives



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Return of the Natives

By Mary Taylor Gray

They sound like a collection of colorful misfits — bonytail, humpback chub, squawfish, flannelmouth sucker, stoneroller. They're our native Colorado fishes, a group swimming uphill in a fight for survival.

Most of the fish we're familiar with — rainbow, brook and brown trout, tiger muskie, kokanee salmon, even carp — are not native to Colorado but were introduced as sport fish. In fact, biologists estimate that only 12 fish species were native to the Colorado River drainage within Colorado's borders, and 28 species were native to the South Platte (mostly small fish like minnows and darters).

Since the mid-1800s, the numbers of native fish and fish species in Colorado have been declining. For many species this decline in quantity and diversity appears linked with the influx of white settlers during the 1859 Colorado gold rush. Some, like the yellowfin cutthroat, have become extinct. Six species are now listed as threatened or endangered in Colorado: The Colorado squawfish, humpback chub, razorback sucker and bonytail are Colorado River fishes, while the greenback cutthroat trout and Arkansas darter are eastern slope fish. Twenty other natives are species of special concern, meaning their future may be in danger.

Colorado's native fish adapted over millennia to rivers with a cycle of fast, turbid spring flooding followed by clear, low water and drought in late summer, fall and winter. Human settlement wrought great changes. Water is a precious resource in an arid state like Colorado. Our high quality of life here is a result of managing water for human needs. But damming rivers and creating reservoirs greatly altered the natural dynamics of our free-flowing rivers, leaving native fish suited for cyclic conditions that no longer existed.

The Colorado squawfish once migrated upstream great distances to historical spawning grounds, releasing its eggs in summer when river flows were lower and the water was warm. Dams disrupted migration patterns and prevented the fish from reaching spawning sites. Releases of cold water from deep reservoirs prevented spawning, stopped the eggs from developing, and generally created conditions unfavorable to warmwater fish downstream.

Native fish depend on the natural cycle of spring flooding in other ways. High spring flows scour the riverbed, removing silt and exposing gravel that fish and many insects (the fish's food base) need for depositing their eggs. While water management provides more stable water levels in many rivers (preferred by sport fish), it annually dries up some streams completely or eliminates the natural flooding cycle favored by native fish species.

Channelizing streams for flood control caused other problems. It eliminated streamside vegetation, overhanging banks, and access to seasonally flooded habitat. Lacking the protective backwater areas of a naturally meandering streambed, food, eggs, and young fish are washed downstream.

Water inhabited by native fish has become polluted due to a wide variety of human activities. Acid and heavy metals have leached into streams from old mines and tailings. Spring runoff now carries agricultural and urban pesticides and fertilizer, petroleum residue, and effluents from industry and urban water treatment. Chlorine in treated water released into a river can be toxic to fish even in very low concentrations. High concentrations of naturally occurring selenium released in connection with agricultural land use practices and erosion is suspected to interfere with reproduction of razorback suckers, an endangered species.

Even livestock grazing along waterways can hurt native fish by trampling and destroying streamside vegetation. Erosion of the destabilized streambank results in siltation, causing the stream channel to widen and become very shallow. This and loss of shading from riparian vegetation cause water temperatures to rise. These changes are highly detrimental to fish adapted to clear, fast-flowing streams.

Finally, the introduction of non-native fish added to the burdens of Colorado's native species. The new fish species competed more successfully for food and habitat in the altered river environment. Brown and brook trout, for example, are more aggressive than native cutthroat. These introduced trout displace native cutthroat from preferred habitat and sometimes prey directly on the cutthroat eggs and young.

So what is the future for our native fish? The success of the greenback cutthroat trout recovery program shows that we can save our native fish from extinction. With 19 stable populations established in the South Platte and Arkansas rivers, the greenback cutthroat will likely be downlisted from "threatened" to "unlisted" in the next few years. By contrast, the bonytail is extirpated in the wild (except for a nonbreeding population of very old fish in

Recovering the Squawfish

Condensed from a paper by Perry Olson, Director, Colorado Division of Wildlife

The Colorado squawfish represents the top predator of the native fishes of the Colorado River Basin, and were it not for its present endangered status, would probably be the principal attraction of a unique native sport fishery in the State of Colorado. It lives in the warmwater reaches of the Yampa, White, and Colorado rivers on the Western Slope and reaches an adult size of up to 3 feet in length and 15 to 20 pounds in weight.

The Colorado squawfish is noted for long-distance migrations to select spawning areas, and return migrations to a home range. Young squawfish, hatched from eggs deposited in spawning areas, are dispersed downstream as passive, drifting larvae to warm, productive, nursery backwaters. By some mechanism as yet undetermined, these young fish redistribute themselves 6 to 8 years later as recruits to adult populations in the Green, Yampa, Colorado, and White rivers.


Colorado's approach to squawfish recovery includes both flow-related and non-flow alternatives for Colorado squawfish and their habitat. Within Colorado, the Yampa,

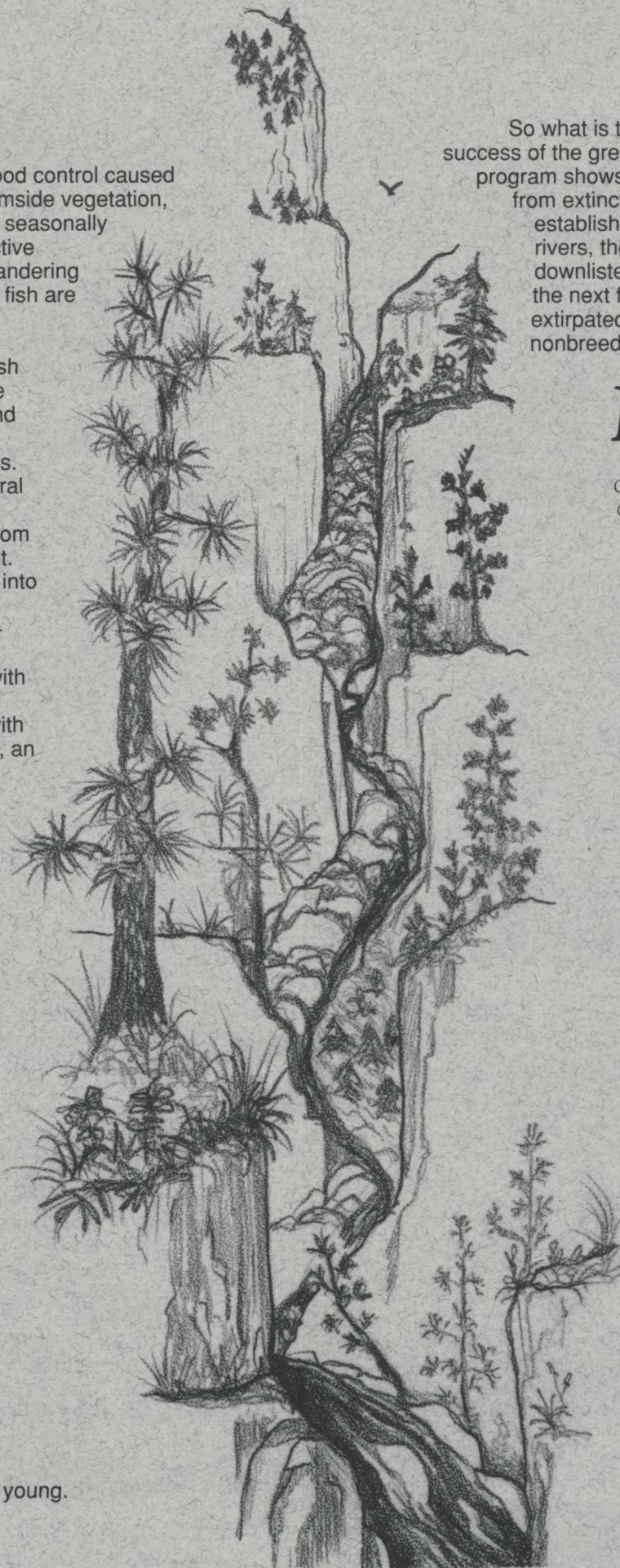
Lake Mohave, Nevada), and there are only two captive populations. Colorado is in the process of establishing a bonytail population at Horsethief State Wildlife Area and hopes to begin breeding them at a native fishes hatchery. The Native Fishes Management Plan (discussed elsewhere in this issue) will concentrate on sustaining native fish species and their habitat. With care and lots of work, we can conserve the legacy of our native fish for the future.

White, and Colorado rivers provide habitat predominantly for adult Colorado squawfish. Our goal is to maintain adequate habitat in these rivers to sustain these adult stocks. In each of these river reaches, it will be important to maintain flow regimes resembling the natural hydrograph (flow pattern) and to maintain or restore channel structure and riparian zones to provide necessary seasonal habitat. A natural hydrograph implies the presence of higher flows during spring runoff that increase to a peak and decrease to stable baseflows during the remainder of the year. It should not be confused with the term "historical hydrograph" that implies restoration of pre-depletion water volumes in the flow regime. The volumes of water needed for recovery remain a key focus of research.

Additional objectives are as follow:

1. Restore backwater habitat for both adult and young squawfish.
2. Modify warmwater sport fishery management to reduce access and abundance of non-native gamefish predators in the river.
3. Re-establish adult stocks of Colorado squawfish above instream barriers in the Colorado and Gunnison.
4. Provide passage over these barriers to reconnect adult habitat in the upper rivers with existing wild stocks and nursery habitat in the Grand Valley.
5. Modify floodplain and riparian zone management to optimize the potential of the Colorado River in the Grand Valley as a nursery backwater habitat.

In order to achieve some of these objectives, it is necessary that juvenile phases of the fishes life cycle in Utah be adequately protected or enhanced. Recovery of the Colorado squawfish is not an impossibility, but it will require a cooperative effort in multiple areas concerning flows, habitat, non-native fish management, augmentation, and research to effectively reach the desired end. 



Fish Stories

By Mary Taylor Gray

"Pulling gently in order not to break his line ...he was astounded to see the head of an enormous fish appear above the surface. The monster came with barely a wriggle... (Of fish swimming around the boat) the longest appeared to be the length of the cabin, as he floated in the water, and that was four feet...with a circumference of fifteen inches. These fish are now called Colorado River salmon. The flesh was white and they seemed to us good eating."

From *A Canyon Voyage*, by Frederick S. Dellenbaugh, an account of John Wesley Powell's 1869 exploration down the Colorado River.

A minnow that grew to six feet in length and 80 pounds? Historic accounts report **Colorado squawfish** of these monstrous proportions once lurked in the depths of the Colorado, Yampa, White, Gunnison and Green rivers. North America's largest minnow, the squawfish was also the primary predator of the Colorado River system. Named by early explorers who saw Indian women fishing for them, squawfish were also commonly called "white salmon" for their mild, white flesh and the long distance migrations they made in great numbers to their spawning grounds.

Squawfish evolved in the muddy, swift-flowing habitat of the Colorado, its warm, quiet backwaters functioning as nursery grounds for young fish. Dams and water diversion projects quickly changed conditions, and this once abundant fish is now an endangered species found in only a few isolated portions of its former range. The largest squawfish reported in many years have been only about 3 feet long and 15 pounds.

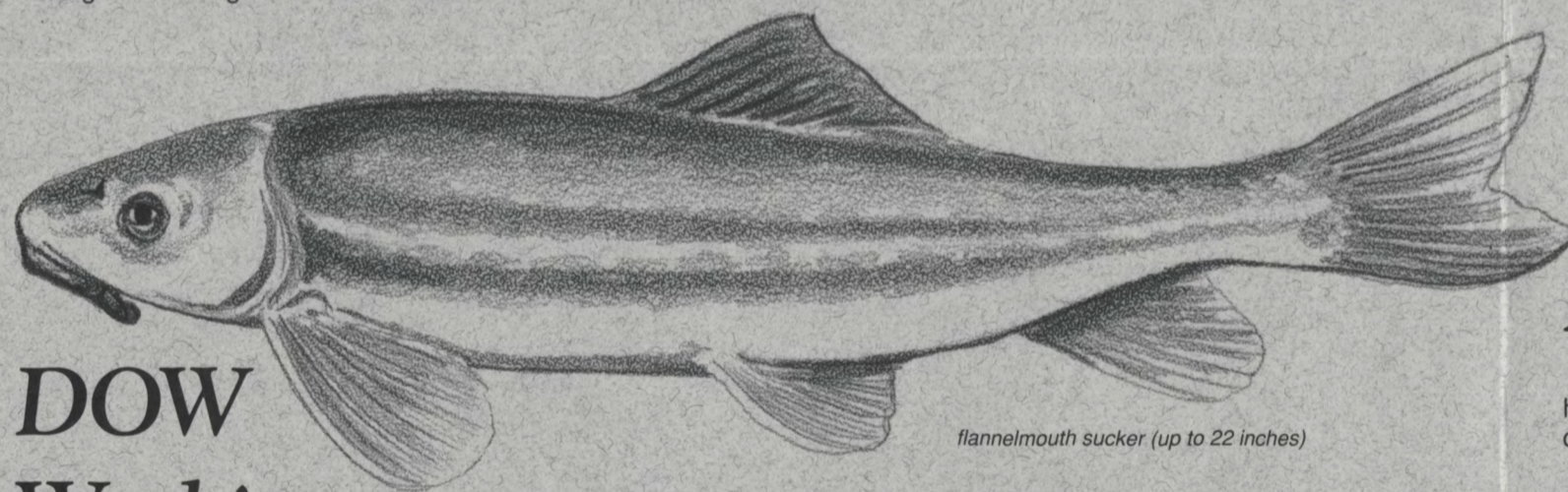


plains killifish (3.5 inches)

Another large minnow (growing to about 18 inches in length), the **humpback chub**, lived in the deep water canyons of the Colorado where the water is fast and turbid. Now on the federal and state endangered species list, habitat changes that hurt squawfish also affected this minnow. Low water and reduced flow from damming may have allowed the roundtail chub to move into waters previously suitable only for humpbacks. As a result, biologists suspect that the roundtail chub cross-bred with the humpback chub. Releases of cold water from canyon reservoirs may also have hurt the humpback chub because its eggs hatch in 66-68 degree water.

At a length of 2 inches, the **northern redbelly dace** is more in line with our image of minnows. A colorful fish, it has a spotted, olive-brown back, dark side stripes and a cream belly. During breeding season the stomachs of males turn red. Only 5 specimens of this rare minnow have been collected in Colorado in recent years, all of them along Plum Creek near Denver.

The streamlined, torpedo-shaped **speckled dace** is native to the Colorado River basin and has survived quite successfully. Its success may be due, at least in part, to its tolerance for nutrient-rich waters resulting from human activities such as sewage treatment. Reaching a length of 4 1/2 inches, the speckled dace is omnivorous and prefers fast moving water and gravel stream bottoms.



flannelmouth sucker (up to 22 inches)

DOW Working For Wildlife

Report: Native Fish

The Colorado Division of Wildlife (DOW) has initiated an innovative and exciting partnership with the Colorado water user community to keep native fish off the threatened and endangered (T & E) list.

The logic behind this partnership is simple: If any particular wildlife species population gets to the critical point where it has to be listed as threatened or endangered, the management and subsequent habitat manipulations for that species become intense. Protective laws and regulations take over to ensure the T & E species' survival. It is easier, cheaper, and more beneficial (for both humans and wildlife) to maintain a viable native fish population than to play catch-up with any species' recovery once its status becomes critical.

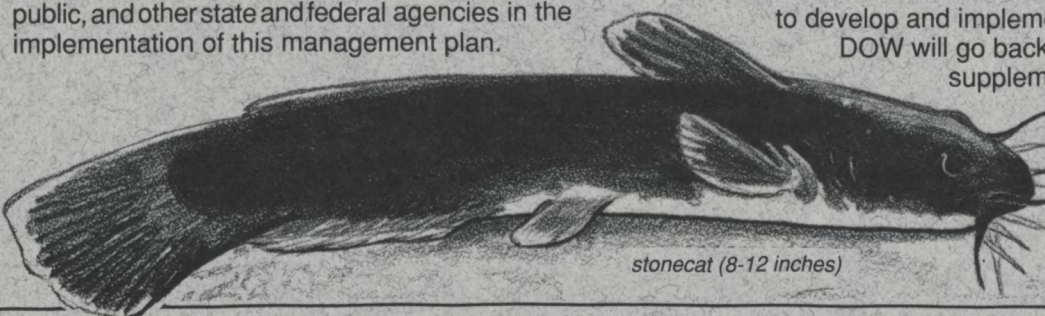
DOW Aquatic Section Chief Eddie Kochman has challenged DOW senior fish biologists, research leaders, U.S. Fish & Wildlife Service aquatic specialists, and directors of the water user groups to work together to keep native aquatic species off the T & E list. During a DOW-sponsored native fish species workshop on May 4, 1992, the informal partnership agreed to the following goal and its objectives:

DEVELOP A STATEWIDE MANAGEMENT PROGRAM TO SUSTAIN NATIVE AQUATIC WILDLIFE AND THEIR HABITAT.

1. Monitor the presence, distribution, and abundance of Colorado's native fishes, herptiles, crustaceans, and mollusks.

2. Maintain or enhance the abundance of these native species via established criteria and goals concerning distribution, abundance, and habitat needs.

3. Encourage input and participation by Colorado's scientific community, interested public, and other state and federal agencies in the implementation of this management plan.

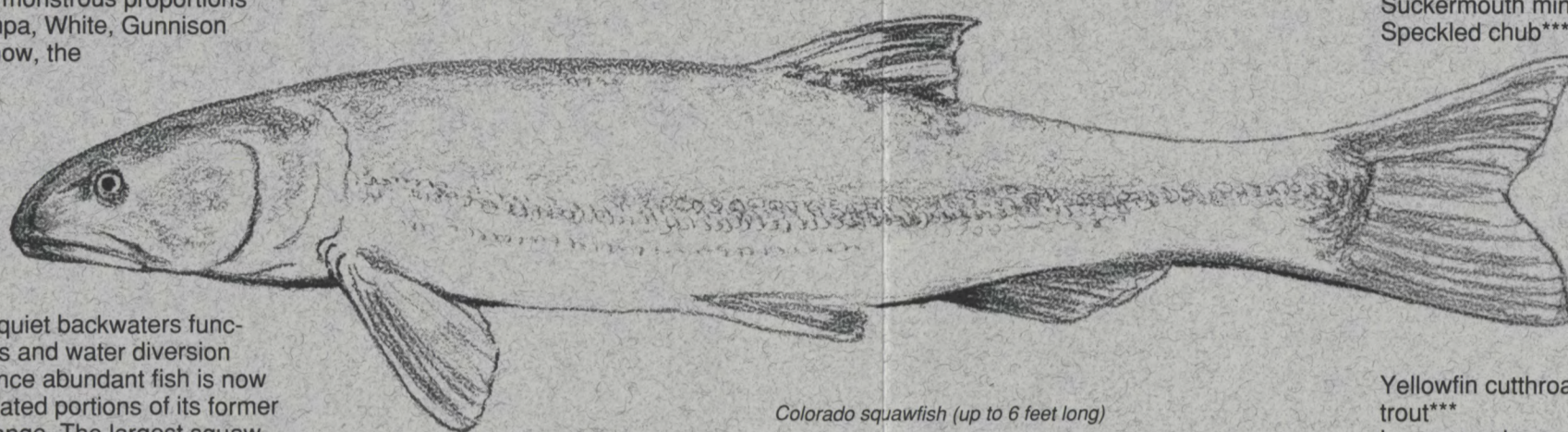


stonecat (8-12 inches)

During spawning season, male **red shiners** turn from silver and white to a bright orange-red on the head and fins, and blue on the sides, with a patch of purple behind the gills. This hardy, 3-inch minnow is a native of the eastern slope but has been accidentally introduced to the Colorado River drainage.

Looking a bit like a zebra with its dark stripes, the 3.5 inch **plains killifish** is abundant in the South Platte River and in intermittent eastern streams. Killifish are adapted to tolerate warm water (as much as 86 degrees) and drought conditions as plains streams become choked with algae and dry up in summer heat.

The **stonecat** is a native catfish prone to hide under rocks and along sandbars. Its spines have a toxin that unwary anglers who mishandle this fish will painfully discover. The stonecat reaches a length of 8 - 12 inches. Colorado is on the western edge of the stonecat's range, and the species is not particularly abundant here.



Colorado squawfish (up to 6 feet long)

How To Watch Fish

For terrestrial beings like ourselves, peering into the three-dimensional, watery world of fish is a challenge. Not only does light reflect from the surface, making it hard to see into the water's depths, but many fish seek cover in mid-day to avoid being seen.

Fish watching is better in low light conditions — early or late in the day, or in shadows — so avoid times of bright sun. Polarized sunglasses are a handy tool for seeing fish in water. Look for underwater snags and shallow pools where the fish may be feeding. Many fish species become more brightly colored and congregate during spawning, making observation easier.

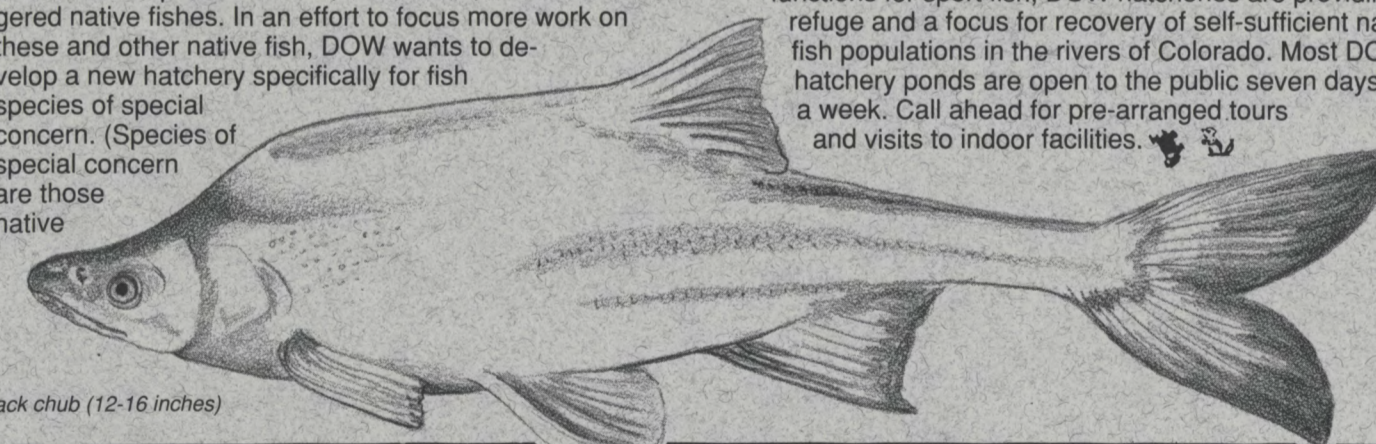
As with any wildlife watching, you will have better luck if you approach carefully and quietly. Fish can see you on the bank, so avoid allowing your figure or shadow to loom over the water and use the shelter of shadows. Fish sense the vibrations as you approach, so move slowly and softly. Lie down on the bank on your stomach (shades of Huck Finn) and watch the water patiently. Your low profile and stillness will reassure the fish, and you may even get a restful nap out of it — unless the mosquitoes find you first!

Native Fish In Hatcheries?

Do hatcheries or aquaria replace Mother Nature, holding rare and endangered wildlife with no habitat left to call home? Not if DOW can help it!

Hatcheries are not meant to replace natural habitat. A hatchery is only a tool of the aquatic biologist. It is a laboratory for developing intensive fish culturing techniques — one tool in the total recovery program seeking the twin objectives of re-establishing healthy and self-sustaining native fish populations in the wild and recovering natural habitat. DOW biologists want to use hatchery-raised populations to stock fish back into waters where native species are missing; they leave self-sufficient populations alone. At the same time, they are working to recover the habitat so that it can support native fish without requiring annual restocking.

DOW hatcheries have ponds and some research dedicated to special concern, threatened, and endangered native fishes. In an effort to focus more work on these and other native fish, DOW wants to develop a new hatchery specifically for fish species of special concern. (Species of special concern are those native species whose populations may be declining, but are not yet listed as threatened or endangered.) With help now, many of these species can be recovered without requiring threatened and endangered (T & E) listing.



humpback chub (12-16 inches)

species whose populations may be declining, but are not yet listed as threatened or endangered.) With help now, many of these species can be recovered without requiring threatened and endangered (T & E) listing.

A feasibility study for the native fish hatchery, paid for by DOW and the Colorado Water Conservation Board, will be completed this fall. The purpose of this special hatchery will be to: 1) serve as a brood station and refugia for native fish; 2) stock natives back into the wild; and 3) provide life history information on native fishes.

The new hatchery will help several minnow species now found only in low numbers on the eastern plains. It will also continue the work underway at the Bellvue-Watson Research Hatchery to obtain a population of offspring descended directly from wild Colorado squawfish. These fish often live to be 40 years old and require 5 to 7 years to mature. Although only 3 razorback suckers are now in captivity at the Wray hatchery, biologists will try to establish a breeding population. These first-generation (descended directly from wild fish) populations are so valuable they will be kept in three different refuge sites for maximum protection.

While carrying out their breeding and stocking functions for sport fish, DOW hatcheries are providing refuge and a focus for recovery of self-sufficient native fish populations in the rivers of Colorado. Most DOW hatchery ponds are open to the public seven days a week. Call ahead for pre-arranged tours and visits to indoor facilities.

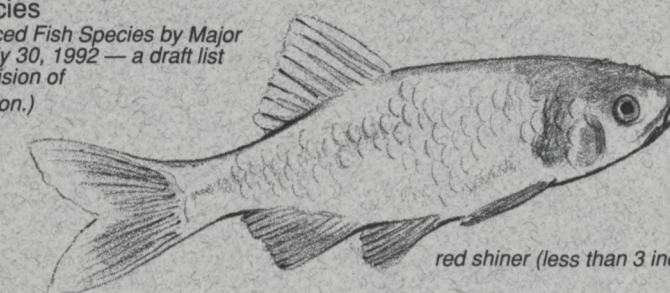
Fish Native to Colorado

* Threatened or endangered status (both federal and state)

** State species of special concern

*** State extirpated species

(Source: "Native and Introduced Fish Species by Major River Basins in Colorado," July 30, 1992 — a draft list prepared by the Colorado Division of Wildlife, Aquatic Wildlife Section.)



red shiner (less than 3 inches)

Arkansas River
Greenback cutthroat trout*
Arkansas darter* (state listed only)
Southern redbelly dace**
Plains minnow**
Suckermouth minnow**
Speckled chub***

Mottled sculpin

Republican River
Suckermouth minnow**
River shiner**
Brassy minnow**
Plains minnow**
Stonecat**
Plains orangethroat darter**
Creek chub
Fathead minnow
Red shiner
Sand shiner
Stoneroller
White sucker
Black bullhead
Plains killifish
Gizzard shad

South Platte River
Greenback cutthroat trout*
Stonecat**
Brassy minnow**
Plains minnow**
Suckermouth minnow**
Common shiner**
Northern redbelly dace**
Plains topminnow**
Iowa darter**
Blacknose shiner***
Hornyhead chub***
Lake chub***
Channel catfish
Black bullhead
Gizzard shad
Stoneroller
Fathead minnow
Red shiner

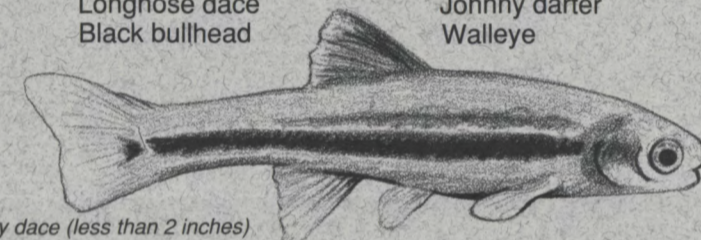
Yellowfin cutthroat trout**
Longnose dace
Gizzard shad
White sucker
Longnose sucker
Creek chub
Flathead chub
Fathead minnow
Sand shiner
Bigmouth shiner
Red shiner
Stoneroller
Channel catfish
Black bullhead
Plains killifish
Green sunfish
Orangespotted sunfish
Brook stickleback



Colorado River
Colorado squawfish*
Humpback chub*
Razorback sucker*
Colorado roundtail chub**
Bluehead sucker**
Flannelmouth sucker**
Mountain sucker**
Colorado River cutthroat**
Bonytail***
Speckled dace
Mountain whitefish

Rio Grande River
Rio Grande sucker**
Rio Grande chub**
Rio Grande cutthroat trout**
Bullhead minnow**
Shovelnose sturgeon***
American eel***
Longnose gar***
Green sunfish
Fathead minnow
Red shiner
Longnose dace
Black bullhead

Bigmouth shiner
Sand shiner
Longnose dace
Creek chub
White sucker
Longnose sucker
River carpsucker
Plains killifish
Brook stickleback
Green sunfish
Orangespotted sunfish
Johnny darter
Walleye



northern redbelly dace (less than 2 inches)

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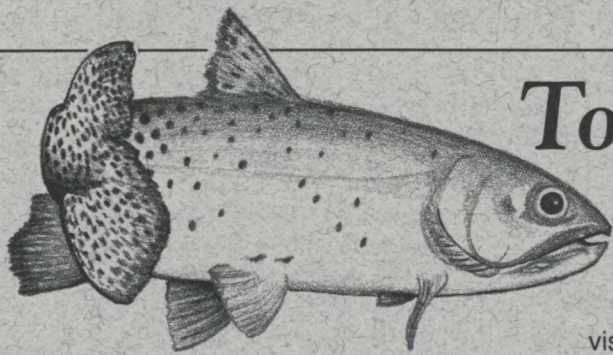
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Everybody involved seems to agree that the native fish species management plan is a keeper.



greenback cutthroat trout (9-10 inches)

To See Colorado's Native Fish

In June when they are spawning, **greenback cutthroat trout** are visible in Rocky Mountain National Park at the inlet stream of Bear Lake and from the boardwalks through the beaver ponds. They may also be seen in several tributaries to the South Platte River including Como Creek, Sheep Creek, or Williams Creek. You may also view greenback cutthroats at the Bellvue Research Hatchery in Ft. Collins. Call 303-482-1141 prior to visiting to be sure someone is there to meet you.

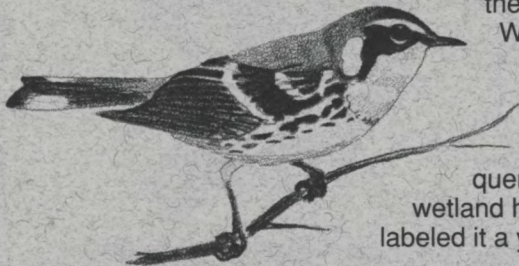
The Horsethief State Wildlife Area is setting up six clearwater refuge ponds with small populations of **squawfish, humpback chub, razorback sucker and bonytail**. For information and directions contact Frank Pfeifer of the U.S. Fish and Wildlife Service Grand Junction office at 303-245-9319.

Colorado squawfish can be seen in aquaria inside the lobby of DOW's central region office at 6060 Broadway, the office of the Denver Water Board, both in Denver, and the public library in Rangely. Squawfish can also be viewed at the Bellvue Research Hatchery in Fort Collins.

P.S. Although not a native fish, fall is a great time to watch spawning **brook trout** in small, clear tributary streams. The males turn a bright crimson-orange on their sides and bellies to alert females and competing males of their sex and readiness to mate. Groups of males face upstream jockeying for position. Sometimes they spar by rushing at each other, nipping or whipping at one another with their tails.

Not!!!

On the cover (eek!) of our summer 1992 issue of *Colorado's Wildlife Company*, we called the right bird by the wrong name.



yellow-throated warbler

We drew a common yellowthroat (a warbler found frequently in Colorado wetland habitat) and labeled it a yellow-throated

warbler (an eastern species rarely found in Colorado). That's why two birds (now correctly labeled) are mingling with the fish in this issue.



common yellowthroat

Thanks to Harold Holt, a Colorado resident and nationally known author on birding, for kindly setting us straight.



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