Native fishes of the Canadian River, New Mexico

New Mexico Department of Game and Fish
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CO
NM
OK
TX

White Sucker
Catostomus commersonii

Flathead Chub
Platygobio gracilis

Creek Chub
Semotilus atromaculatus

Suckermouth Minnow
Phenacobius mirabilis

Longnose Dace
Rhinichthys cataractae

Southern Redbelly Dace
Chrosomus erythrogaster

Red Shiner
Cyprinella lutrensis

River Carpsucker
Carpiodes carpio

Black Bullhead
Ameiurus melas

Green Sunfish
Lepomis cyanellus

Longear Sunfish
Lepomis megalotis

Gizzard Shad
Dorosoma cepedianum

Rio Grande Cutthroat Trout
Oncorhynchus clarkii virginalis

Central Stoneroller
Campostoma anomalum

Sand Shiner
Notropis stramineus

Northern Plains Killifish
Fundulus kansae

Fathead Minnow
Pimephales promelas

Western Mosquitofish
Gambusia affinis

Channel Catfish
Ictalurus punctatus

Plains Minnow
Hybognathus placitus

Arkansas River Shiner
Notropis girardi

Flathead Catfish
Pylodictis olivaris

Peppered Chub
Macrhybopsis tetranema

Vermejo River
Canadian River headwaters
Chicorica Creek
Cimarron River
Maxwell National Wildlife Refuge
Eagle Nest Reservoir
Canadian River
Ocate Creek (dry riverbed in drought)
Canadian River
Kiowa National Grassland
Ute Creek
Coyote Creek
Mora River
Conchas River
Conchas Dam
Revuelto Creek
Canadian River below Ute Dam

Canadian River
Vermejo River
Chicorica Creek
Dry Cimarron River
Raton
Ponil Creek
Cimarron River
Rio del Plano
Springer
Rayado Creek
Chico Creek
Ocate Creek
Canadian River
Coyote Creek
Kiowa National Grassland
Ute Creek
Mora River
Sapello River
La Cinta Creek
Sanchez
Conchas River
Conchas Reservoir
Logan
Ute Reservoir
Revuelto Creek

Native fishes of the Canadian River, NM

The New Mexican river flowing from the Rocky Mountains to the Great Plains

New Mexico Department of Game and Fish
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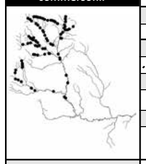
White Sucker
Catostomus commersonii



max. length	lifespan
320 mm TL	17 years

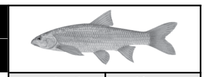
stream type

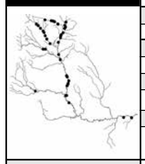
substrate

food resources

habitat	found in high elevation streams and lakes; prefers habitat with cover such as logs
spawning period	J F M A M J J A S O N D
life history	lays up to 50,000 eggs; eggs sink to the stream bottom; larvae drift; juveniles can be identified by three dusky blotches

Flathead Chub
Platygobio gracilis





max. length	lifespan
200 mm TL	5-6 years

stream type

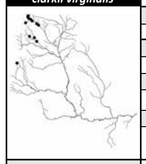
substrate

food resources

habitat	swift current with shifting sand or gravel substrate in the main river channel
spawning period	J F M A M J J A S O N D
life history	breeding male grows small nuptial tubercles; female lays up to 7,000 eggs; eggs roll along river bottom as they grow

Rio Grande Cutthroat Trout
Oncorhynchus clarkii virginalis

SGCN



max. length	lifespan
385 mm TL	8 years

stream type

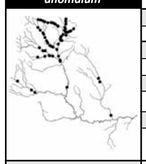
substrate

food resources

habitat	prefers clear, cold streams and lakes; habitat is affected by livestock use
spawning period	J F M A M J J A S O N D
life history	state fish of New Mexico; male trout have bright red breeding colors; eggs laid in gravel nest built by female fish

Central Stoneroller
Campostoma anomalum

SGCN

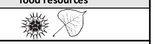


max. length	lifespan
160 mm TL	4 years

stream type

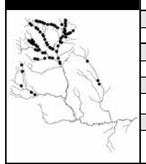
substrate

food resources



habitat	pools with flowing water and riffles in small rocky streams; prefers low turbidity
spawning period	J F M A M J J A S O N D
life history	males develop nuptial horns and move stones to make nests; female lays 450-5,000 that are buried and left unguarded

Creek Chub
Semotilus atromaculatus



max. length	lifespan
250 mm TL	3-4 years

stream type

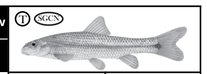
substrate

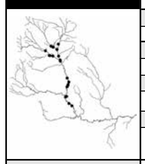
food resources

habitat	young chub prefer slow-flowing areas; select areas with cover to avoid predators
spawning period	J F M A M J J A S O N D
life history	male chub carry stones in their mouths to build nests, then cover eggs with gravel and guard nest until hatching

Suckermouth Minnow
Phenacobius mirabilis

T SGCN





max. length	lifespan
100 mm TL	5 years

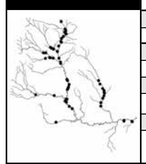
stream type

substrate

food resources

habitat	prefers riffles; avoids silty areas but tolerates moderate water turbidity
spawning period	J F M A M J J A S O N D
life history	sexually mature at two years of age; spawns in gravelly riffles in response to unpredictable river flows; 800-1,600 eggs

Sand Shiner
Notropis stramineus



max. length	lifespan
80 mm TL	3 years

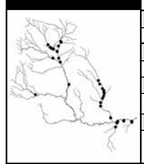
stream type

substrate

food resources

habitat	forms large schools in shallow waters with low flow, such as bottoms of pools
spawning period	J F M A M J J A S O N D
life history	breeding males have fine tubercles; females broadcast spawn up to 1,000 eggs during low flow; eggs sink to bottom

Northern Plains Killifish
Fundulus kansae



max. length	lifespan
80 mm TL	2 years

stream type

substrate

food resources

habitat	low velocity, shallow, turbid water; tolerates high salinity and temperature
spawning period	J F M A M J J A S O N D
life history	buries into sand with head showing when resting; each female lays up to 30 eggs; eggs buried in sand and not guarded

Longnose Dace
Rhinichthys cataractae

max. length	lifespan
100 mm TL	3 years

stream type

substrate

food resources

habitat	lives in between cobble in swift-flowing riffles; larvae prefer areas of slow flow
spawning period	J F M A M J J A S O N D
life history	fish active nocturnally; females deposit adhesive eggs in cobble crevices; up to six clutches of eggs per year

Southern Redbelly Dace
Chrosomus erythrogaster

E SGCN

max. length	lifespan
55 mm TL	3 years

stream type

substrate

food resources

habitat	pool and run habitat in permanent high elevation streams with clear cool water
spawning period	J F M A M J J A S O N D
life history	breeding males highly colored, heads covered in tubercles; fish mate during the first year of life; spawns in schools

Fathead Minnow
Pimephales promelas

max. length	lifespan
65 mm TL	2 years

stream type

substrate

food resources

habitat	prefers pools with algae and plants; tolerates heat and salinity
spawning period	J F M A M J J A S O N D
life history	breeding males develop nuptial horns and broader bodies; spawns in crevices; females deposit eggs on nest ceiling

Western Mosquitofish
Gambusia affinis

max. length	lifespan
50 mm TL ♀	2 years

stream type

substrate

food resources

habitat	shallow pools, ponds, backwaters and stream margins; survive in drying pools
spawning period	J F M A M J J A S O N D
life history	male has modified anal fin for internal fertilisation; female fish bear live young; male fish are small (27 mm TL)

Red Shiner
Cyprinella lutrensis

max. length	lifespan
75 mm TL	3 years

stream type

substrate

food resources

habitat	occupies lower velocity habitat, such as pools and backwaters; very abundant
spawning period	J F M A M J J A S O N D
life history	courtship lasts hours; females produce sounds to attract males; spawns in riffles, sometimes over sunfish nests

River Carpsucker
Carpiodes carpio

max. length	lifespan
590 mm TL	10 years

stream type

substrate

food resources

habitat	mostly found in the depths of rivers, large creeks, and lakes with high turbidity
spawning period	J F M A M J J A S O N D
life history	matures at 3 years of age; produces more than 100,000 eggs; spawning occurs in large groups; exhibits no parental care

Longear Sunfish
Lepomis megalotis

max. length	lifespan
150 mm TL	4 years

stream type

substrate

food resources

habitat	low velocity parts of rivers or lakes; usually found near or in aquatic plants
spawning period	J F M A M J J A S O N D
life history	males build and guard nests using their tails; mating pairs swim circles around nest during spawning

Channel Catfish
Ictalurus punctatus

max. length	lifespan
1300 mm TL	14 years

stream type

substrate

food resources

habitat	wide range of habitats (pools, riffles, and runs); prefers dark places with cover
spawning period	J F M A M J J A S O N D
life history	lays up to 50,000 eggs in nest; sharp spines on fins protect from predation; barbels covered in taste buds

Plains Minnow
Hybognathus placitus

max. length	lifespan
130 mm TL	2 years

stream type

substrate

food resources

habitat	travels in schools in shallow, turbid rivers; lives near substrate to find food
spawning period	J F M A M J J A S O N D
life history	spawns during periods of high flow; each female can lay 4,000 eggs; eggs develop into embryos while drifting downstream

Arkansas River Shiner
Notropis girardi

E

max. length	lifespan
65 mm TL	2 years

stream type

substrate

food resources

habitat	prefers shallow pools formed by shifting sand in turbid water
spawning period	J F M A M J J A S O N D
life history	spawning is stimulated by high river flow; eggs develop into larvae as they drift downstream; lays up to 3,000 eggs

Black Bullhead
Ameiurus melas

max. length	lifespan
380 mm TL	5 years

stream type

substrate

food resources

habitat	found in small to large lakes, canals, and pools in small streams and rivers
spawning period	J F M A M J J A S O N D
life history	active at night; females make saucer-shaped nests in mud; males guard eggs; juveniles swim in compact schools

Green Sunfish
Lepomis cyanellus

max. length	lifespan
180 mm TL	6 years

stream type

substrate

food resources

habitat	lives in warm pools; survives in isolated pools and colonizes intermittent streams
spawning period	J F M A M J J A S O N D
life history	male fish make grunts to attract mates; up to 50,000 eggs laid in nests made by males; males care for young

Gizzard Shad
Dorosoma cepedianum

max. length	lifespan
350 mm TL	7 years

stream type

substrate

food resources

habitat	juveniles live in still surface water; adults inhabit deep water near the river bottom
spawning period	J F M A M J J A S O N D
life history	spawning occurs over sand and rock; lay up to 350,000 eggs; eggs attach to plants and rocks; move in schools

Flathead Catfish
Pylodictis olivaris

max. length	lifespan
1200 mm TL	20 years

stream type

substrate

food resources

habitat	prefers deep, turbid, low-velocity pools; also found in lakes and reservoirs
spawning period	J F M A M J J A S O N D
life history	lays up to 100,000 eggs; tastes with its barbels; ambush predator that feeds at night; has no natural predator

Peppered Chub
Macrhybopsis tetranema

T SGCN

max. length	lifespan
60 mm TL	2 years

stream type

substrate

food resources

habitat	found in large streams with swift-moving water; prefers water with low clarity
spawning period	J F M A M J J A S O N D
life history	adults spawn during high river flow; embryos wash downstream as they develop; bodies covered with taste buds

The Canadian River captures water from approximately one million acres, making it the third largest drainage of the eight drainages in New Mexico. The headwaters begin high up on the eastern slopes of the Sangre de Cristo Mountains (in southern Colorado and north-eastern New Mexico). These small streams are fed by snow melt and flow through vast pine forests and lush meadows. The river flows to lower elevations along the eastern boundary of the Great Plains, increasing in size and carving its way through shortgrass prairie, rocky canyons, and shrublands.

The Canadian River has two large reservoirs: Conchas Reservoir (completed in 1939) and Ute Reservoir (completed in 1963). Conchas Reservoir was built for agricultural water storage, drinking water, and recreation. Downstream from Conchas Reservoir, the Canadian River flows through arid ranchland before entering Ute Reservoir. This reservoir captures water from both the Canadian River and Ute Creek. Below Ute Reservoir, the Canadian River is wide, shallow, and sandy. The Canadian River continues through New Mexico before flowing into Texas where it eventually joins the Arkansas River.

The large reservoirs and other dams affect the **natural flow cycle** and the annual variation in **discharge** (i.e., the rate of water flow, measured in cubic feet per second). Drastic alterations in discharge impact the distribution, habitat availability, and reproductive behavior of some fish species. Also, dams break the river into "fragments" so that fish migration is restricted and fish populations become isolated from one another.

Native fish fauna

There are 24 fish species that are native to the Canadian River, making it one of the most diverse native fish assemblages in the state. Due to their habitat requirements, many of these species are only found in certain zones of the river. Species distributions can be influenced by **elevation** (the distance above sea level), the type of **substrate** (e.g., cobble, gravel, or sand), or the **turbidity** of the water (how murky it is). Species diversity increases downstream in the lower elevations where water is warmer.

Over half of the native fishes in the Canadian River are **minnows** (family Cyprinidae). The other families are very diverse, from herbivorous **suckers** (family Catostomidae) to voracious fish-eating **catfish** (family Ictaluridae) and **sunfish** (family Centrarchidae). Many male minnows are decorated seasonally to attract mates; Southern Redbelly Dace is brightly colored while Fathead Minnow and Central Stoneroller are both ornamented with nuptial horns on their heads or bodies.

Other minnows have unique **reproductive strategies**. For example, Arkansas River Shiner spawns during high flow events, detecting changes in water velocity and turbidity. Their eggs are partially **buoyant** and hatch while drifting in the river current. Peppered Chub and Plains Minnow have similar reproductive strategies. Central Stoneroller is aptly named: male stonerollers move rocks and gravel with their mouths to make nests for their young.

There are several other fascinating native fish found in the Canadian River. Suckermouth Minnow looks like a sucker, but is actually a minnow (the scientific name, *Phenacobius mirabilis*, roughly translates to "deceptive miracle"). Southern Redbelly Dace is limited to only a small section of high elevation montane streams in a tributary of the Mora River.

Conservation

Human impacts on the landscape over many centuries have changed the river ecosystem. There have been alterations to river discharge, habitat, and food resources. Subsequently, populations of many native fish species have declined. However, the relationship between the decline of certain fish populations and alterations to the river system are poorly understood, and fish populations in the Canadian River are understudied.

In order to protect our native fishes and to fill in these gaps in our knowledge of their populations, efforts have been made recently to study the distribution, life histories, and population sizes of the most vulnerable species. In New Mexico, these species are listed as **Species of Greatest Conservation Need** (SGCN). This listing indicates that these fish species require conservation action, including research to learn more about their biology. Better understanding of the fishes can assist management actions to stabilize populations so that the fish will not to be listed as **threatened** or **endangered** by the state or federal government.

RIVER DISCHARGE

US Geological Survey gauges near Sanchez and near Logan

Mean monthly discharge at two stream gauges from 1963, when Ute Reservoir was completed, until 2014. Discharge is measured in cubic feet per second (cfs). Sanchez gauge is located upstream of Conchas Reservoir, so discharge is not influenced by the major dams. Logan gauge is downstream of Ute Reservoir where discharge is reduced. Peaks in discharge are from spring run-off and summer monsoon rain. Pulses of high flow are important cues for reproduction in some fish species.

HOW A RIVER CHANGES AS IT FLOWS DOWNSTREAM

High-elevation streams
water: swift, clear, cold
substrate: dominated by cobble and gravel
geomorphology: steep banks
edge habitat: shady pine forest with closed canopy

Mid-elevation streams
water: moderately deep and slow
substrate: dominated by sand and gravel
geomorphology: sloping banks
edge habitat: open canopy - shrubs and willows

Low-elevation streams
water: shallow, slow, turbid
substrate: sand and silt
geomorphology: wide floodplain
edge habitat: grasses and willows

This project was funded by the New Mexico Department of Game and Fish's Share with Wildlife Program. Share with Wildlife is a donation-funded program that was created to "provide additional wildlife funds to perpetuate the renewable wildlife resource of New Mexico that gives so much pleasure and recreation to all New Mexicans."

DEFINITIONS OF TERMS AND SYMBOLS

NM state conservation status	max. length
T Threatened E Endangered SGCN Species of Greatest Conservation Need	TL: total length (from tip of snout to end of tail) 25.4 mm = 1 inch

stream type

intermittent	small	intermediate	large

substrate

silt	sand	gravel	cobble

food resources

fish		zooplankton *microscopic animals*	
insects *more abundant in silt and sand*		algae	
insects *more abundant in cobble*		aquatic vegetation	
non-insects *snails, clams, crayfish*		detritus *decaying vegetation from trees*	

habitat	
backwater	off channel, zero velocity habitat
pool	deep, low velocity habitat
run	moderate depth, moderate velocity habitat
riffle	shallow, cobbled, high velocity habitat

Want to learn more about fishes in New Mexico?

Look for these resources:

BISON-M http://www.bison-m.org
FishNet2 http://www.fishnet2.net
NMDGF http://www.wildlife.state.nm.us
Fishes of Texas http://www.fishesoftexas.org

Fishes of New Mexico (1990) by Sublette, Hatch, and Sublette. University of New Mexico Press

Distribution and Conservation Status of Fishes in the South Canadian River, New Mexico (2012) by Dudley, Brandenburg, Farrington, Renfro, and Platania. Submitted to NMDGF

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