

# Red Shiner Eradication



Invasive **Red Shiner** were successfully eradicated from the **Virgin River** in Utah. This project represents a major achievement towards **native fish conservation** in the arid western U.S.

The **Virgin River** is a linear oasis flowing from its headwaters in southwest **Utah** through **Arizona** and **Nevada** until it empties into Lake Mead. This river provides essential resources for both people and animals as it flows through the otherwise arid red-rock landscape of the Mojave Desert.

The Virgin River supports unique fish species adapted to living in this harsh environment. Several of these fish are found nowhere else on earth, including the **endangered Virgin River Chub** and **Woundfin**. However, the existence of these endemic fish is threatened by an invasive intruder. **Non-native Red Shiner** were illegally introduced as a bait fish in the lower Colorado River and colonized the Virgin River in Utah in the 1980s. Red Shiner **decimated** Virgin River native fish populations as they relentlessly spread upstream.

Since 1997, the Virgin River Program and Utah Division of Wildlife Resources have worked tirelessly to eradicate Red Shiner. A **systematic, downstream removal plan** was developed by segmenting the river into manageable reaches separated by fish barriers. Successive rotenone treatments were conducted in phases beginning east of St. George and moving downstream towards the Arizona border (see figure below).



Marine discovery (CC BY-SA 4.0)

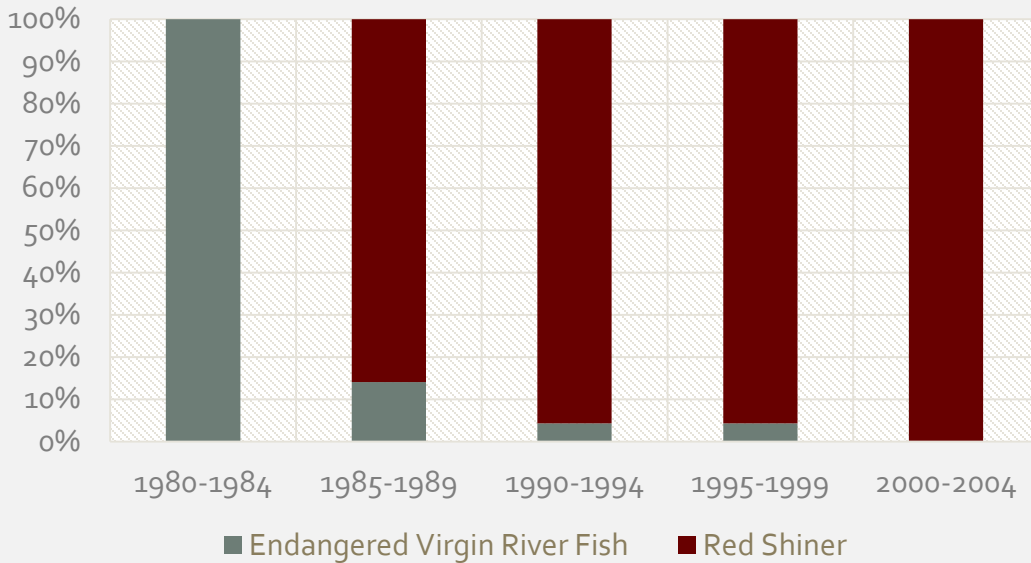
## Aquatic Plague

When Red Shiner appear, native fish disappear. But **why** is this small minnow so destructive? Red Shiner **reproduce very quickly**; a handful of fish becomes millions in a few short years. Hoards of Red Shiner **out-compete native fish** for resources like food and habitat. Red Shiner also **eat the eggs and larvae** of native fish.



Red Shiner have been removed from over **100 miles** of rivers, creeks, canals, drains, marshes, and ponds in Utah and Arizona.

## Red Shiner vs. Native Fish



Native Virgin River fish and Red Shiner cannot co-exist. After Red Shiner first colonized the upper Virgin River in the 1980s, sampling conducted by the Utah Division of Wildlife Resources showed the rapid and devastating impact these invasive minnows had on endangered Woundfin and Virgin River Chub populations.

Red Shiner photograph © MO Dept. of Conservation



Barrel dripping rotenone into the Virgin River © UDWR

In June 2021, the **final phase** of the Red Shiner eradication plan was **successfully completed**. Multiple government agencies worked to conduct two final rotenone treatments in the Virgin River Gorge. This strategy was effective, and **100% of Red Shiner were successfully eradicated** from the Virgin River in Utah. Post-treatment sampling demonstrated how **quickly native fish recolonized** the now Red Shiner-free reach.

This successful project was the culmination of nearly three decades of work and represents a major achievement toward native fish conservation in the arid western U.S.

### WHAT'S NEXT?

*Eradicating Red Shiner in Utah was a critical step, but there's still work to do.*

- ▶ Restore native fish in areas where Red Shiner have been removed.
- ▶ Continue Red Shiner eradication downstream into Arizona and Nevada.
- ▶ Address threats from other non-native species in the Virgin River Basin.



Woundfin



Virgin River Chub

For more information, please contact:

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