

**U.S. FISH AND WILDLIFE SERVICE  
SPOTLIGHT SPECIES ACTION PLAN**

**Common Name:** Woundfin  
**Scientific Name:** *Plagopterus argentissimus*  
**Lead Region:** Mountain-Prairie Region (Region 6), Denver, Colorado  
**Lead Field Office:** Utah Ecological Services Field Office  
2369 West Orton Circle, Suite 50  
West Valley City, Utah 84119  
801-975-3330

**Species Information:**

**Status:** Endangered with Critical Habitat  
**Recovery Priority Number:** 1 C  
**Recovery Plan:** Virgin River Fishes Recovery Plan (1995).<sup>1</sup>  
**5-year Review:** Completed February (2008).<sup>2</sup>  
**Other:** Consultation on the Virgin River Resource Management and Recovery Program (2000).<sup>3</sup>

**Threats:** Over the course of the past 30 years, woundfin populations have declined throughout their occupied range and critical habitat. Populations in the lower Virgin River (approximately from Lake Mead upstream to the Virgin River Gorge fish barrier) are reduced almost to the point of extirpation. Woundfin populations in the upper Virgin River (approximately from the Virgin River Gorge fish barrier upstream to Quail Creek diversion), particularly those upstream of the influence of red shiner, have historically persisted better than any other river reach. However, recent problems with water quality have caused woundfin populations to decline in this reach.

~~Woundfin cannot persist in areas where red shiner occur. In 1995 only the upper 16 miles of critical habitat (upstream of Washington Fields Diversion) were free of red shiner. Significant nonnative fish removal efforts (mechanical and chemical) were expended since that time to protect the upper reaches of critical habitat. Results from recent sampling indicate that 2009 marks the first year in over two decades that no red shiner have been found upstream of the Arizona/Utah border fish barrier. Red shiner control has and will continue to require a significant management effort; however, this species has been removed from the upper Virgin River (~ 36 miles of woundfin critical habitat). In the lower Virgin River, red shiner are an active threat and additional invasive nonnative fishes remain in portions of the Virgin River system, including tilapia which periodically migrate upstream from Lake Mead.~~

Reduced base flows are of major concern and seriously threaten woundfin populations throughout critical habitat. The effects of reduced flows, exacerbated by the severe and persistent drought in recent times (the lowest Virgin River flows on record occurred in 2002), have negatively affected woundfin and other native species throughout the Virgin River, including the population upstream of Washington Fields Diversion. This population exhibited a strong reproductive response during

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<sup>1</sup> Virgin River Fishes Recovery Plan. 1995. Department of Interior, U.S. Fish and Wildlife Service.

<sup>2</sup> The Virgin River Fishes, Woundfin (*Plagopterus argentissimus*) and Virgin River chub (*Gila seminuda*) 5-Year Review: Summary and Evaluation. 2008. U.S. Fish and Wildlife Service, Utah Field Office, West Valley City, Utah. [http://ecos.fws.gov/docs/five\\_year\\_review/doc1908.pdf](http://ecos.fws.gov/docs/five_year_review/doc1908.pdf)

<sup>3</sup> Intra-Service Section 7 Consultation on Federal Participation in the Proposed Virgin River Resource Management and Recovery Program. 2000. Utah Field Office, West Valley City, Utah.

2005, when wetter conditions prevailed. However, reproduction occurred late that year and this positive population response, when combined with poor water quality conditions, did not have a lasting effect. More recently (2007) fish kills resulting from poor water quality have extirpated most wild woundfin from its last remaining habitat upstream of the Washington Fields Diversion.

The Virgin River Resource Management and Recovery Program (Virgin River Program) (see below for more information) is attempting to reestablish woundfin populations via stocking from hatchery raised fish. In the upper Virgin River however, poor water quality (primarily insufficient flows and high summer water temperatures) is hampering woundfin survivability, reproduction, and recruitment.

**Target:** A specific and meaningful 5-year goal for woundfin in terms of its conservation status: continued maintenance of the species through multiple captive populations, and re-establishment of the species in multiple stream sections in the wild.

**Measure:** Maintain refugia/production woundfin populations at a minimum of two hatcheries. Develop and maintain a wild reproducing and recruiting population of woundfin in the Pah Tempe Springs-to-Washington Fields Diversion reach of the upper Virgin River. If red shiner can be chemically removed from the Arizona and Nevada portions of the lower Virgin River where flow from springs and groundwater provides more natural instream flow, concurrently establish a wild reproducing and recruiting population in these areas. Because nonnative red shiner have been removed from most of the upper Virgin River, achieving appropriate water quality and quantity will be the focus in this portion of the river. Achieving the re-establishment target in the lower Virgin River will require construction of fish barriers and chemical removal of nonnative fishes including red shiner. If appropriate locations in systems other than the Virgin River can be identified for woundfin release, develop and implement stocking and monitoring program for these areas.

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**Actions:**

- Determine the timing, magnitude, and duration for instream flow necessary to address low flow/high water temperature conditions in the Virgin River, especially during the summer period.

*Identify responsible parties for the actions:* The Utah Division of Wildlife Resources began work on this action, but will need additional funding to hire staff and complete this action.

*Estimated costs of the actions:* \$50,000 per year, for two years

- Identify and secure water to meet target instream flows.

*Identify responsible parties for the actions:* We will work closely with the Virgin River Program and the Washington County Water Conservancy District to identify and secure water for instream flows.

*Estimated costs of the actions:* Unknown at this time.

- Continue ongoing Virgin River Program recovery efforts including: 1) maintain red shiner free habitat in the upper Virgin River via mechanical and chemical treatments as necessary; 2) continue downstream efforts in red shiner rotenone treatments; 3) construct

fish barriers to prohibit nonnative fish from reinvading upstream reaches; 4) provide technical assistance to lower Virgin River conservation and recovery team efforts; 5) direct and fund intensive culture research and broodstock management; and 6) continue yearly population monitoring and stocking program. See Virgin River Program website for more information: <http://www.virginriverprogram.org>.

*Identify responsible parties for the actions:* We will work closely with the Virgin River Program and its partners to continue these actions.

*Estimated costs of the actions:* Approximately \$2 million per year.

- Initiate an effort to develop a water quality study and water quality management protocols to address conditions that have had negative impacts on the native fish of the upper Virgin River.

*Identify responsible parties for the actions:* We will work closely with the Virgin River Program to develop a scope of work and study design and to award a contract to a researcher for this work.

*Estimated costs of the actions:* \$137,000 preventing extinction grant awarded spring 2009.

- Evaluate the need for a basin-wide program level peer review of woundfin and Virgin River chub recovery related activities. This effort could analyze recovery plan goals and recovery related activities in the upper and lower Virgin River and determine the need for modification or better coordination of current and future actions.

*Identify responsible parties for the actions:* USFWS personnel from Utah, Nevada, and Arizona will work closely with Virgin River Basin conservation and recovery programs to determine the need for this review. If necessary, we will work with our national peer review program to accomplish this action.

*Estimated costs of the actions:* \$50,000 – \$75,000

- Begin nonnative fish removal in the Virgin River reach between the Arizona/Utah border fish barrier and the Virgin River Gorge fish barrier.

*Identify responsible parties for the actions:* We will work closely with the Virgin River Program and lower Virgin River recovery partners including Arizona Game and Fish Department and Nevada Department of Wildlife to develop a plan for nonnative fish removal and initiate removal actions.

*Estimated costs of the actions:* \$120,000 – \$150,000

**Role of other agencies:** The Virgin River Program (comprised of Utah Department of Natural Resources, USFWS, Washington County Water Conservancy District, Bureau of Land Management, National Park Service, U.S. Forest Service, The Nature Conservancy, Dixie Conservation District, and Washington County Farm Bureau) was formally established on January 5, 2002. The goals of the program are to protect and recover listed and sensitive species in the Virgin River while ensuring that new and historical water uses are protected throughout the upper basin. The Virgin River Program coordinates, directs, and funds recovery actions for listed species (woundfin, Virgin River chub, and the southwestern willow flycatcher). The Virgin River

Program also expedites management actions taken to promote conservation of the following State sensitive species: Virgin spinedace, flannelmouth sucker, and desert sucker. The Virgin River Program consists of eight elements: 1) complete description of baseline elements; 2) provide and protect instream flows; 3) protect and enhance aquatic, riparian and 100 year floodplain habitat; 4) protect and enhance native species communities; 5) maintain genetically appropriate brood stocks; 6) determine ecologically limiting factors; 7) monitor habitat conditions and populations of native species; and 8) improve education and communication on resource issues. The Virgin River Program has an annual operating budget of approximately \$2 million.

The Arizona Game and Fish Department and Nevada Department of Wildlife also work through their respective USFWS offices toward recovery of woundfin and Virgin River chub. Over the next five years efforts will focus on construction of a permanent fish barrier structure upstream of Lake Mead to preclude invasion of nonnative fishes, completion of lower Virgin River system planning and preparation for nonnative fish removal, and initiation of eradication actions for red shiner and other nonnative fishes from the mainstem Virgin River and tributaries downstream of the Virgin River Gorge. Repatriation of woundfin will follow successful eradication of exotic fish. The Virgin River Habitat Conservation and Recovery Program is anticipated to begin implementation in 2010 through USFWS Region 8. The group has developed updated draft recovery implementation strategies for reaches of the river in Nevada and Arizona, and is anticipated to provide some level of future funding to assist woundfin recovery implementation in Nevada and some areas of Arizona.

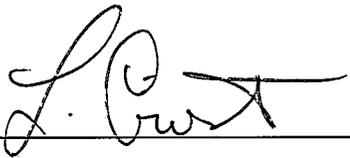
**Role of other ESA programs:** Human population growth in Washington County, Utah, Lincoln County, Nevada, and Mohave County, Arizona impacts the Virgin River corridor. Old bridges are being repaired, new bridges are being constructed, and utility lines that cross the river will be upgraded or installed. Also, groundwater development (which could affect Virgin River flows) and land exchanges with Bureau of Land Management could affect the Virgin River Basin. These projects are typically subject to Section 7 of ESA because of a federal nexus with the U.S. Army Corps of Engineers or with the Bureau of Land Management.

**Role of other FWS programs:** A genetically diverse brood stock of woundfin is maintained at the Dexter National Fish Hatchery and Technology Center in Dexter, New Mexico. This facility has also produced fish for releases in the upper and lower Virgin River in accordance with approved reintroduction plans. Woundfin from Dexter National Fish Hatchery and Technology Center have been transported to the State of Utah facility at Wahweap to establish a second captive population, to the Bozeman Fish Technology Center in Bozeman, Montana for intensive culture research, and to Bubbling Ponds Fish Hatchery in Arizona for fish culture experimentation.

**Additional funding analysis:**

- Insufficient flow is the most prominent limiting factor for woundfin populations in the upper Virgin River. Although Virgin River water rights are fully appropriated, the State of Utah has a limited instream flow program for purchasing water rights for instream flows. Due to development pressure in the St. George area, the purchase of instream water rights has been limited due to the lack of any willing sellers. However, if willing sellers could be identified, there may be potential to establish instream water rights in the upper Virgin River and thus, the need for additional funding. A cost estimate for this action is unknown at this time.

- Additional funding could be utilized to help achieve recovery goals via establishment of additional woundfin populations in other drainages (e.g., in the Gila River Basin). In the past, woundfin have been stocked into historical habitat on an experimental basis, but with no success. A more systematic approach for reintroduction could be developed with a comprehensive analysis of possible sites and methods. This could be performed by the U.S. Geological Survey through their Science Support System program, or by a private contractor. Estimated cost would likely be between \$50,000 and \$75,000.
- There is interest in mitigating the relatively warm water and high mineral content of Pah Tempe Springs through Bureau of Reclamation's Salinity Control Program. If such a project were feasible and significantly beneficial to woundfin recovery (some information indicates that this high mineral content is beneficial to wild woundfin), this would be another project considered for additional funding. A cost estimate for this action is unknown at this time.



Larry Crist, Utah Field Supervisor

10/20/09

Date