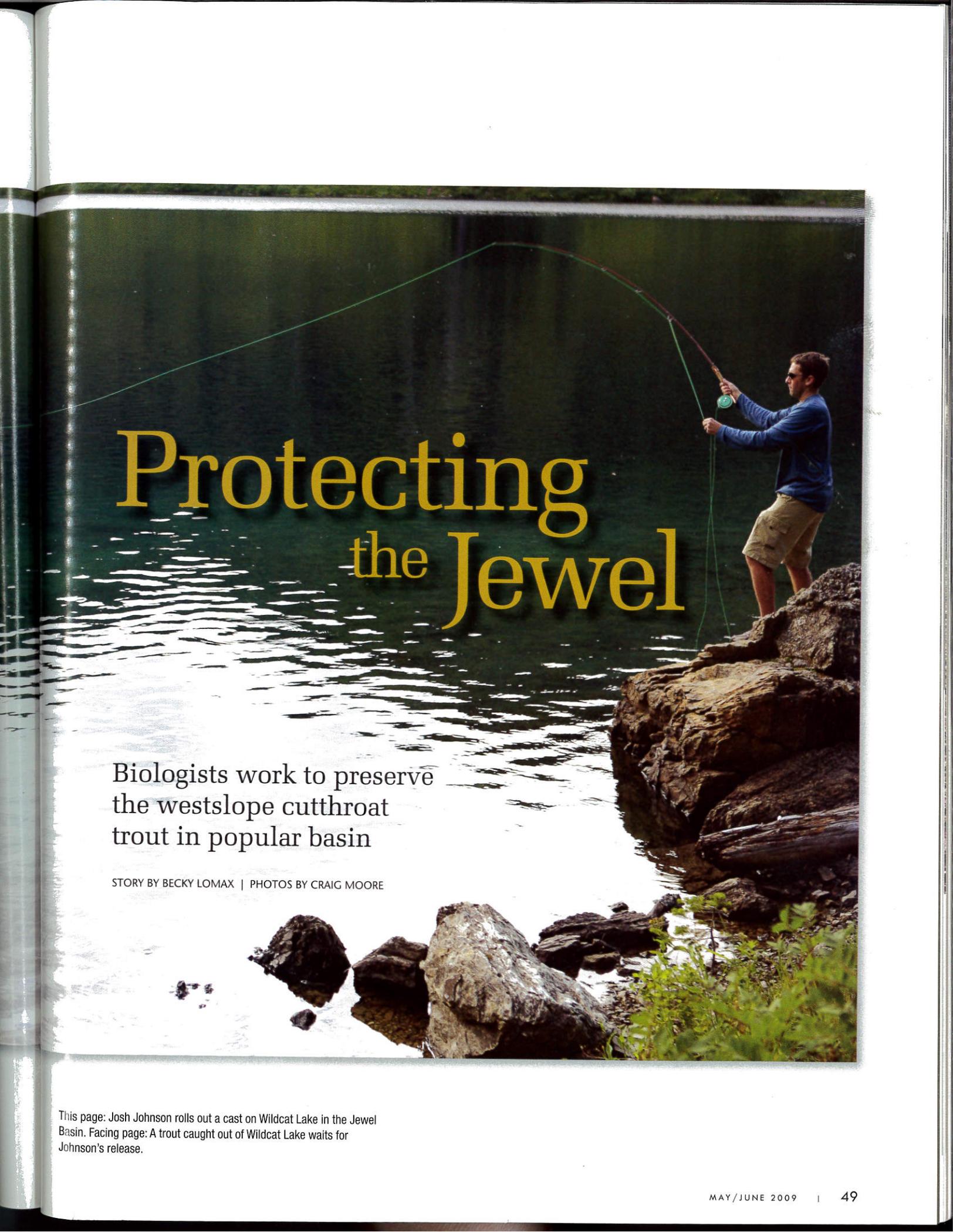


From atop the highest pinnacle of the Jewel Basin in the northern Swan Range, a sea of jagged rock outcroppings swoop into green sub-alpine bowls. Sparkling lakes—27 of them—dot the high basin, their streams tumbling into the South Fork of the Flathead drainage. Many of these lakes lure anglers, for their waters bounce with large trout.

The Jewel's fisheries, however, are undergoing transformation. Biologists are swapping the nonnative species that inhabit some of the Jewel's lakes for a native fish. Now in its third year, the South Fork of the Flathead project aims to protect one of Montana's largest strongholds for pure westslope cutthroat trout. ▶



A man in a blue long-sleeved shirt and khaki shorts is standing on a rocky shore, casting a fishing line into a lake. The line is arched in the air. The water is dark and reflects the sky. The background shows a dense forest.

Protecting the Jewel

Biologists work to preserve
the westslope cutthroat
trout in popular basin

STORY BY BECKY LOMAX | PHOTOS BY CRAIG MOORE

This page: Josh Johnson rolls out a cast on Wildcat Lake in the Jewel Basin. Facing page: A trout caught out of Wildcat Lake waits for Johnson's release.

The South Fork drainage contains half of Montana's pure native westslope cutthroat and provides an interconnected ecosystem for the trout to go through its full life cycle. Evolving since the ice ages, these



cutthroats adapted to survive harsh environments, thriving in cold, clear nutrient poor waters, feeding aggressively on insects, and finding ways to endure drought, wildfire and floods. "The project protects a critical genetic legacy," says Bruce Farling, executive director of Montana Trout Unlimited. "It's an important scientific, cultural, recreational and economic goal. We don't want to throw the population away."

Contrary to other remote South Fork lakes, those in "the Jewel"—as locals call it—attract scads of hikers due to its 50 miles of trails within a few minutes of the Flathead Valley. Most visit the 15,349-acre hiking-only area on

day excursions from July through September. Beth Burren, recreation forester for Flathead National Forest, reports that the popular Camp Misery trailhead averages 100 hikers per day

during summer months. Good weather weekends double that amount with many aiming for lake destinations—prime waters for both fly casting and spin fishing. But the Jewel was once fishless. Rugged waterfalls barred the way for aboriginal westslope cutthroat trout to migrate upstream into the Jewel's pristine high lakes. To enhance recreation in the South Fork drainage, government agencies and local outfitters from the 1920s into the 1960s stocked lakes with some nonnative trout. "Several decades ago, the state didn't recognize westslope cutthroat," says Matt Boyer, fisheries biologist with Montana Fish, Wildlife and Parks. "A trout was a trout." ▶

 A photograph of a man in a dark t-shirt and jeans balancing precariously on a wooden chair. He is holding a light bulb in his right hand, ready to change it. The scene is set in a room with a white door and a window.

A pair of silver step ladders leaning against each other.

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This page: A group of day hikers head into the Jewel Basin from the Camp Misery trailhead east of Kalispell. Facing page: The Jewel Basin attracts outdoor enthusiasts of all kinds.

The trout tossed into the Jewel's lakes turned out to be rainbows, Yellowstone cutthroats, and westslope cutthroats—the first two nonnative to the drainage. They proliferated, interbreeding into hybrids. From the Jewel, some of them moved downstream colliding with populations of pure westslope cutthroat in lower elevations. In doing so, they chewed into the pool of genetically pure native fish.

Native westslope cutthroat trout once ranged across western Montana and the upper Missouri drainage. Hybridization, habitat loss and ecosystem degradation sliced the species' terrain back to one-tenth of its historic range. While the U.S. Fish and Wildlife Service has declined to list the fish as endangered or threatened, it is designated as Montana's state fish and a sensitive species of concern.

Three-year stocking rotations of westslope cutthroat into the lakes failed to reduce the threat to the pure westslope cutthroat. Fisheries biologists investigated 10 different solutions to eliminating the nonnative trout, including testing barriers, trapping, electrofishing, and even introducing predatory fish. But none of the methods provided a complete removal of the rainbow and Yellowstone cutthroats eating genetically into the native population.

The winning solution ended up being a 10-year project to remove the unwanted fish with piscicides, or fish poison, and restock the lakes with westslope cutthroat trout. The project, launched in 2007, has been vetted by Trout Unlimited and American Fisheries Society scientists,

says Farling. Of the 21 lakes in the South Fork of the Flathead targeted for rehabilitation, one-third sat in the Jewel.

To clean one of the Jewel's lakes of nonnative fish takes three days—one for set up, one for application of the chemical rotenone and one for testing and cleanup. While the area is closed to the public, the chemical is applied to the lake by air, boat and foot. Streams in and out of the lake also need application by backpack sprayer.

Boyer and his crews opt for fall after the recreation season wanes. Fall is also the best time to administer the chemical because other organisms—plankton, frogs, and insects—have grown past aquatic stages, plus the water is colder, which ensures a complete kill.

For two years prior to projects, biologists conduct surveys of both inlet and outlet streams, assessing a baseline population of insects, amphibians, fish and plankton. They also collect stream-flow data and measure the volume of the lakes. The data is used to gauge the least amount of chemical needed to kill the nonnative trout.

Biologists helicopter in supplies: barrels of the chemical poison, application and water testing gear, and a motorized rubber raft or aluminum boat. When the chemical kills the fish, most sink to the lake bottom. Boyer and his crew collect those that float and sink them also mid-lake. "The fish are not available to wildlife for consumption, and their nutrients serve to kick-start the primary production in the lake the following year," explained Boyer. As the fish decay, plankton and insects, in particular, get a jump on repopulating the food chain for the lake before new trout are introduced. The South Fork project has already treated seven lakes, including three in the Jewel Basin. Others are scheduled for treatment in coming years.

Rotenone—a derivative from organic substances found in the roots of some tropical and sub-tropical pea family plants—has been approved by the EPA for use in fisheries. It has been used as a fish poison for over 50 years in North America, including the rehabilitation of five Jewel Basin lakes prior to the project. "There are no other alternatives to guarantee 100 percent removal of the hybrids, and the safeguards are 100 percent solid," says Farling.

Fish absorb rotenone through the gills where it inhibits

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oxygen transfer on the cellular level. Signs posted at Jewel Basin trailheads and at the lakes warn hikers to refrain from drinking the water after its use; however, because the substance does not absorb easily through the skin or gastrointestinal tract, it reacts less severely in humans. "A human or dog would have to drink an extremely large quantity of water immediately after lake treatment to experience effects," Boyer says.

Biologists prefer rotenone to other poisons, in part because it breaks down rapidly. "In 1.5 to two months, the rotenone dissipates, and the lake detoxifies," says Boyer. "We're back in business really fast." It also breaks down with consumption rather than passing into other wildlife. "If bears or raptors eat the fish killed by rotenone, it is broken down in their guts."

The South Fork project aims to remove the threat to westslope cutthroat and bolster populations with a genetically pure brood stock reared at the Washoe Park Hatchery in Anaconda. Biologists restock the lakes with westslope cutthroat of varying age and size the spring following cleaning. Boyer estimates that the combination approach should restore large fish within four to six years.

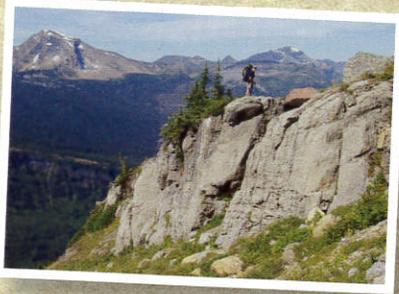
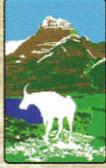
In the Jewel's southern region, Pilgrim Lakes may benefit from "genetic swamping" instead of chemical treatment. Such swamping involves dumping large numbers of native fish into a lake in an attempt to dilute the non-native gene pool. "We're looking toward not having to use pesticides," explains Boyer. "Swamping basically is a numbers game, giving fish a competitive edge to outbreed and outcompete other species."

With either method, the Jewel Basin is being transformed into a sanctuary for pure westslope cutthroats that should benefit generations of hikers and anglers to come. "When we embark on a project like this, we have the opportunity to conserve native species in a stronghold and conserve part of Montana's natural heritage," says Boyer. **M**

Becky Lomax is a freelance writer who lives in Whitefish.

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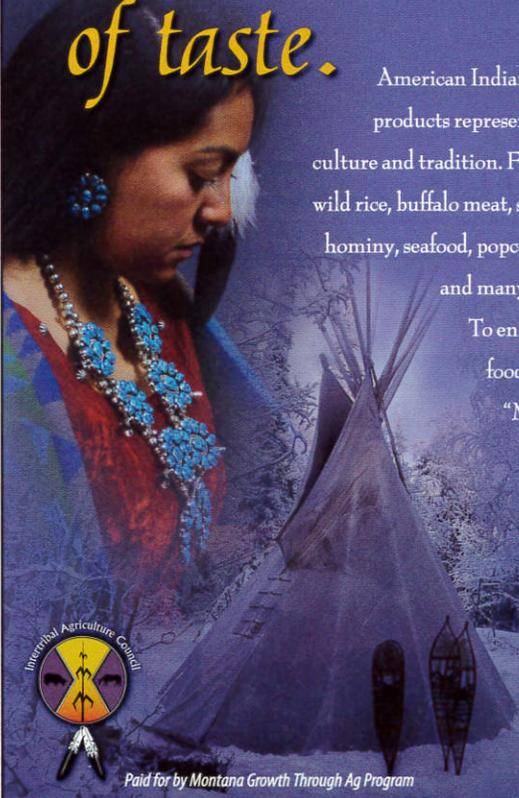
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