



TROUT ECOLOGY
MONTANA STATE UNIVERSITY





The need to protect our streams and native fish is more important now than ever. The environment and habitat that serve our trout and coldwater fisheries is changing at a rapid rate. This creates an extraordinary demand to preserve the incredibly valuable fisheries in our region. A healthy habitat is vital to manage our aquatic resources and continue recreational and commercial contributions to the region.

Fishing in Montana contributes an estimated \$907 million annually to the state, and a key element of this industry—and what makes Montana unique—is an abundance of wild trout. Moreover, Montana’s native cutthroat trout, arctic grayling, and

bull trout, are important symbols of Montana's natural heritage and exemplify a deep appreciation of wildlife and historically stalwart conservation values.

THE FORESIGHT TO PROTECT

In the years following World War II, road and highway construction took a heavy toll on streams and rivers in Montana. In 1959 recognizing the degradation of this precious resource, fisheries biologists—many of whom were MSU grads—had the prescience to create a list of ‘blue-ribbon waters’ classifying high quality trout streams in Montana and set about devising how to protect them.

By 1962 these wildlife professionals with the Montana Department of Fish and Game (now called Montana Fish, Wildlife, and Parks) had begun conducting studies and gathering data on 13 streams to compare trout numbers pre- and post-channel alterations due to road construction. The ensuing report delineating the results of the studies showed significant decline of trout populations, which initiated the first of its kind legislation in the nation: the 1963 Montana Stream Protection Act.

RESEARCH DIRECTED POLICY

Montana continued leading the way in wild trout conservation and management with MSU-educated fisheries professionals working alongside MSU faculty who often directed research. Cooperatively methods were pioneered for sampling large trout rivers via electrofishing and for the development of long-term monitoring programs of wild trout populations.

With new techniques for conducting research, MSU alumnus, Dick Vincent conducted a landmark study on the Madison River demonstrating the adverse effects of stocking hatchery trout on wild trout. The outcomes of Vincent’s research led to the institution of a progressive policy in 1974 when the State of Montana ceased stocking hatchery fish in streams and rivers where wild trout populations persisted.

Soon to follow was the initiation of catch and release and other special angling regulations that are now commonplace throughout the world's trout waters. The switch from stocking hatchery trout to protecting and enhancing wild trout fisheries was truly revolutionary, and sparked tremendous interest in wild trout angling across the globe.





CONSERVATION MANAGEMENT

...FOR YELLOWSTONE NATIVE TROUT

MSU faculty and students are actively engaged in assisting Yellowstone National Park with managing its native trout resources which are threatened by adverse interactions with nonnative species. In Yellowstone Lake, MSU trout researchers have developed a comprehensive model for assessing the effectiveness of the Lake Trout removal program and are actively exploring alternatives to controlling Lake Trout beyond the expensive and labor intensive gillnetting program.

...WITH CLIMATE CHANGE

Trout are well known to be a 'canary in the coalmine' as early detectors of anticipated effects to water flow and water temperature in the Northern Rockies in the coming decades. MSU researchers are presently conducting studies on effects of changing temperature and flow on rainbow and brown trout movement in the Smith River in Montana and examining how temperature affects growth and survival of trout occurring in sensitive headwaters, where many native trout still persist.

Recent research also delved into the important management topic of how high summer temperatures affect angling mortality of trout in Montana rivers. MSU researchers have provided some of the most detailed information on temperature requirements for bull trout, cutthroat trout, rainbow trout and brook trout, vital information for assessing climate change effects on trout growth and survival.

...OF INVASIVE SPECIES

MSU has a long history of conducting basic and applied aquatic ecology research on threats to trout streams including invasive species such as whirling disease and New Zealand mudsnails, irrigation withdrawals, hydropower, livestock grazing, and streambank riprap. Research is being conducted on the impacts of changes to stream discharge, temperature, and fine sediment on food supply for trout. In particular, we are addressing questions related to the ecology and population dynamics of salmonflies, one of the most iconic and economically important aquatic insects that serve as trout prey.

HISTORICAL ANGLING COLLECTION

In addition to the incredible natural laboratory of premier wild trout waters within a 200-mile radius of our Bozeman campus, Montana State also has an unparalleled collection of human and institutional resources related to angling.

The MSU Library houses the nation's only special collection that specifically focuses on all things related to trout and salmonids. The collection contains archival materials from renowned trout anglers and scientists including Bud Lilly, Professor Robert Behnke, George Grant, and Nick Lyons. The Trout and Salmonid Collection also supports the annual Bud Lilly Lecture each spring by nationally renowned trout conservationists.

The vision for the collection is both broad and deep--it is not just an angling collection but rather includes literary tomes, scientific treatises about the fish and their habitat, legal and management texts, culinary books, and economic and political works, and personal diaries. The collection now comprises 12,000 titles and grows weekly. There are volumes in the collection dating from the mid-sixteenth century to the present. The collection resides in the MSU Library's Merrill D. Burlingame Special Collections and is accessible to the public.



Trout & Coldwater Fisheries Chair and Initiative

A Chair will greatly strengthen MSU's offerings and opportunities for fisheries students and significantly augment our faculty in this area. In addition, the Chair will allow us to expand trout and coldwater fisheries conservation education and research in the face of eminent threats to this incredible resource.

The goal for the Trout & Coldwater Fisheries initiative is to raise \$5 million in the form of an endowment, that will:

- Recruit a Chair faculty position of an individual of distinction who will serve as a preeminent teacher-scholar and researcher to lead students and faculty advancing learning and driving relevant research.
- Create an environment that attracts high performing students to work alongside world-renowned faculty.
- Create a strong, sustainable, financial base that builds capital, attracts and retains exceptional faculty, and provides additional resources for increased research and programming.
- Increase MSU's capacity to educate students and train future natural resource managers, including water use and how it influences coldwater fisheries.
- The Chair will work with local stakeholders, outside agencies, and across departments to provide important outreach and communication including workshops for fisheries professionals.
- Direct advanced research that will focus in the following areas:
 - Species Ecology and Management
 - Conserving native trout, invasive species and disease threats, ecology of macroinvertebrates
 - Habitat
 - Climate change, warming water temperatures, altered streamflows, response to habitat restoration
 - Human environment interaction
 - Trout response to angling, involvement of anglers in citizen science and conservation

Your support will lead the effort to *conserve trout in a changing world*. Together we will establish the first endowed Chair for MSU's Fisheries and Science Management program, educate our future natural resource managers and make a significant impact in preserving and protecting our fisheries.

Thank you for your support of Montana State University.