
FISHBIO
Fisheries Research, Monitoring, and Conservation
www.FISHBIO.com

Research, Monitoring, and Conservation | FISHBIO

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At FISHBIO, we offer a fresh approach to fisheries science.

FISHBIO is a fisheries and environmental consulting company dedicated to advancing the research, monitoring, and conservation of fishes around the world. Our mission is to provide innovative solutions to natural resource challenges through sound science, technical expertise, and effective communication. From employing the latest technologies to building custom monitoring equipment in-house, we are at the leading edge of fisheries science.

As a multidisciplinary group of research scientists, engineers, and technicians, we understand the importance of collaboration. Our team has successfully worked in resource-limited settings to provide scientific support in developing countries. We have coordinated with multiple international governments, nonprofits, and local communities to collaboratively fund and implement projects in some of the most diverse and complex ecosystems in the world.

FISHBIO personnel have extensive experience in conducting both rapid assessments and long-term studies, and our skill set includes standard fish sampling methods as well as state-of-the-art monitoring technology. We value giving back to our communities, as well as fostering a culture of creativity and resourcefulness. We pride ourselves in finding efficient and inventive solutions to meet our clients' needs.

OUR ADDRESSES

FISHBIO.com

Our team's website is updated daily with fresh news, stories, photos, and videos. Our blog features three stories a week written by our own scientists on recent research, relevant news, and our daily adventures.

MekongFishNetwork.org

Tools for communication, collaboration, and data management in the Mekong Basin to support the research of Mekong River fishes.

ThreeRiversProgram.com

Three Rivers is a cross-cultural environmental education program started from the grass-roots level and led by FISHBIO staff. The program is designed to connect students to rivers and fish, both locally and abroad.

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FISH POPULATION DYNAMICS

We study the key role fish populations play in supporting fisheries and ecosystem processes. Our work includes fish life history and limiting factor analyses, predator-prey interactions, aquatic food web studies, and monitoring fisheries harvest and management trends.

- Population Status Assessments
- Life History and Population Modeling
- Freshwater and Marine Stock Management
- Commercial and Sport Harvest Management
- Life History Evaluations
- Predator-Prey and Food Web Dynamics
- Hatchery Operations and Impacts
- Limiting Factor Analyses

FISH POPULATION MONITORING

We are highly proficient in the latest tagging and tracking technology to monitor how and where fish move. We coordinate large- and small-scale projects with PIT tag, acoustic, and radio telemetry. We can evaluate fish passage and entrainment as well as fish screen performance.

- Fish Passage Assessments
- Acoustic and Radio Telemetry
- PIT Tag Studies
- Entrainment Evaluations
- Underwater Video and SONAR Surveys
- Fish Screen Evaluations

SPECIALIZED EQUIPMENT

Fabrication for Research and Monitoring Needs

We pride ourselves in our unique ability to design and build customized equipment, tailored to suit individual project needs. Our skilled and creative technicians perform quality construction and craftsmanship, and manage our in-house machine shop and fleet of small research boats.

CUSTOM SOLUTIONS

Efficiency, Accuracy, and Long-Term Reliability

- Fish Traps and Fish Guidance Devices
- Resistance Board Weirs
- Largest-of-its-Kind PIT Tag Antenna
- In-stream PIT Tag Detection Systems
- Fish Ladders and Screens
- Hydroacoustic Monitoring Arrays
- DIDSON/ARIS Mounts
- Wireless Data Retrieval Hardware
- Underwater Video Monitoring Systems
- Remote Solar and Natural Gas Power Systems
- Laboratory and Field Testing Services

DEVELOPMENT SUPPORT

Fish rescue, salvage, and compliance

Our team has considerable experience supporting construction and development projects spanning a range of sizes and situations. From monitoring large dredge operations to craning our boats into hydro-facilities, we have successfully completed our tasks while ensuring compliance for our clients.

COMMUNICATION AND COLLABORATION

We are committed to clear and effective communication through a variety of approaches, including writing, photography, video, data visualization, and social media. Our engagement activities range from international collaborative initiatives to local community outreach and education programs.

- Advancing Transboundary Fisheries Science
- Collaborations with International NGOs, NPOs, Governments, and Universities
- Science Interpretation and Visualization
- Online and Social Media Resources
- Three Rivers Cross-Cultural Environmental Education Program
- School Visits and Community Events

INTERNATIONAL FISH CONSERVATION

We are driven to think globally in addressing the complex challenges of fish conservation. We share skills and expertise to help build technical capacity, advance fish science, and support conservation abroad, including through our Mekong River initiative in Southeast Asia.

- Fisheries Management in Developing Nations
- Fish Conservation Zone Establishment and Monitoring
- Participatory Research
- Tools and Trainings for Building Capacity
- Threatened and Endangered Species Conservation
- Biodiversity Monitoring

THREATENED AND ENDANGERED SPECIES

We are proficient in the permitting and requirements involved in monitoring rare, endangered, and special status species. We conduct population viability analyses, create habitat conservation plans, and assess threats from environmental sources, human activities, and climate change.

- Surveys of Rare, Threatened, Endangered, and Special Status Species
- Endangered Species Permits and Habitat Conservation Plans
- NEPA/CEQA/ESA Compliance Reporting
- Population Viability Analyses
- Climate and Range Shift Analysis

PERMITTING AND COMPLIANCE

Our detail-oriented and knowledgeable staff are experienced working within a regulatory environment. Our expertise includes federal and state permitting, relicensing, compliance monitoring, environmental impact reporting, habitat conservation plans, and ecological risk assessments.

- Experienced with FERC, EIR, EIS, HCP, ESA, NEPA, CEQA
- Ecological Risk Assessments
- Compliance Monitoring
- Streambed Alteration Permits

FISH HABITAT

Our aquatic ecologists understand good habitat is key to fish population success. We conduct fish habitat use and distribution studies, wetland and watershed analyses, benthic macroinvertebrate surveys, GIS mapping, and hydrologic and sediment transport modeling.

- Fish Habitat Assessments
- Aquatic Ecology
- Habitat Modeling
- Watershed Analyses
- Wetland Delineations
- Benthic Macroinvertebrate Surveys
- GIS Mapping and Spatial Information Technology
- Channel Hydrology and Hydraulic Modeling
- Sediment Transport Modeling
- Fish Habitat Use and Distribution

HABITAT RESTORATION

We are competent in every stage of fish habitat restoration, from planning and design to construction and monitoring. Our activities include enhancing riparian habitats for fish spawning and rearing, removing non-native species, and evaluating restoration success.

- Restoration Planning, Design, and Construction
- Riparian Habitat Enhancement for Fish Spawning and Rearing
- Watershed and Ecosystem Restoration
- Non-Native Species Control

THE RIGHT TOOLS FOR THE JOB

Sonar Camera

Boat Electrofishers

Weir and Vaki Counter

Backpack Electrofishers

Marine and River Boats

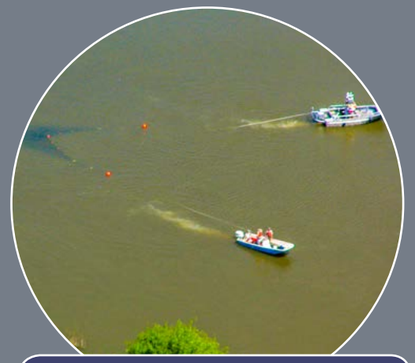
International Monitoring

Fish Flume

Electronics Design

Wet Lab

Screwtrap Sampling



Fish Trawls

Custom PIT Antennas

MEDIA AND COMMUNICATION

Our team recognizes the power of digital media for telling stories that improve scientific awareness and communicate project successes. Our staff includes full-time professionals in videography, graphics and web design, and science writing. All of our field crew are skilled in using underwater cameras, GoPro video cameras, digital SLR cameras, custom underwater housings, and other tools to document our work on the ground and in the water. We produce short films to communicate both our own work and the accomplishments of our clients to the public, agencies, and other interested parties. All of our photo imagery is freely accessible in one of the largest online environmental photo collections on Flickr. We regularly update our blog with engaging stories about fisheries and environmental science, and distribute original content across a wide array of social media platforms.

PROJECT AND ACTIVITY EXAMPLES

FISH CONSERVATION

FISHBIO worked with World Wide Fund for Nature, the Lao Department of Livestock and Fisheries, and local officials in Nam Kading to develop a mark-recapture fish tagging study. The goal of the study was to evaluate the spillover contribution from the fish conservation zones (FCZs) to fisher catches in nearby villages. 'Spillover' is the concept of fish increasing in abundance within a protected area then moving ('spilling') outside of the protected boundaries, where they can be caught by fishers. Our study found evidence to support the idea of spillover.

STATISTICAL MODELING

The FISHBIO team specializes in translating vast amounts of data into understandable outputs. Making the complex simple is a challenging undertaking, but our team takes decades of experience, a strong statistical foundation, and advanced statistical software to provide the best analytical outputs for supporting project needs. Our analyses are published and commonly used in regulatory or guiding documents for fisheries planning.

FYKE MONITORING

FISHBIO conducted a feasibility study to test whether fyke traps could be used to estimate the population of striped bass during the spring. FISHBIO fabrication experts constructed two 10-foot-diameter fyke traps. All healthy striped bass of legal size were tagged with PIT tags and external disc tags. The results of this pilot study demonstrated the successful use of fyke traps to capture and release healthy striped bass in the mainstem of the San Joaquin River.

HABITAT RESTORATION

FISHBIO worked with numerous private, public, and NGO parties to design and implement a floodplain restoration project. The main project goal was to convert an in-stream island's steeply sloped banks into a floodplain that typical spring flows can inundate, thereby producing 2.4 acres of salmon and steelhead rearing habitat. We also relocated gravel from the island to the river channel to replenish spawning beds, removed invasive vegetation along the river, and planted native riparian species.

BEHAVIOR ASSESSMENT

Dual-frequency Identification Sonar (DIDSON) cameras use sound waves to record images in turbid water with low visibility conditions. FISHBIO used a DIDSON camera to evaluate anadromous fish behavior in relation to hydropower operations in a Central Valley river. Using an in-house custom mount, Chinook and rainbow trout/ steelhead behavior was observed below a powerhouse releasing water from 300 to 1,600 cubic feet per second.

ENTRAINMENT MONITORING

FISHBIO constructed and operated two free-standing 12 x 14 ft Passive Integrated Transponder (PIT) antennas and monitored entrainment at two diversions in Northern California. The hand-molded fiberglass antennas detected juvenile and adult rainbow trout in flows exceeding 1,000 cfs. The arrays were over 90 percent efficient at detecting tags ranging from 12 to 23 mm in size.

PROJECT AND ACTIVITY EXAMPLES

INTERNATIONAL OUTREACH

FISHBIO staff are passionate about providing support to developing countries. Many countries in Asia, South America, and other locations are considering new hydropower development and can benefit from lessons learned in the United States from decades of hydropower operation. Our team provides research, training, technical advising, field research, and other aspects of support to international clients and government agencies.

FISH TRACKING

In order to better understand the dynamics of predator and prey, FISHBIO conducted a fine-scale telemetry assessment. The investigation was part of a FERC relicensing study to identify predation dynamics on salmonids. Our team captured and attached external acoustic transmitters to predatory fishes, including Sacramento pikeminnow and striped, smallmouth, and largemouth bass. We subsequently tracked their movements in riffle and pool habitats to evaluate the predation risk of juvenile salmonids in those areas.

RIVER WEIR MONITORING

FISHBIO worked with a client to establish the most comprehensive and longest running salmon and steelhead monitoring program in California's Central Valley. Initiated by FISHBIO personnel in 1993, the program draws on a suite of methodologies to monitor adult and juvenile fishes. The long-term monitoring data supports management decisions and provides an excellent tool to manage the stream and its inhabitants.

FISH DIETS

FISHBIO recently completed the field and laboratory portions of a study to examine the diets of salmonid predators, including striped bass, largemouth and smallmouth bass, and Sacramento pikeminnow. We caught hundreds of predatory fishes using electrofishing techniques at night and we used mechanized pressure to flush out fish stomach contents. Objectives of the project included documenting the rate of predation on sensitive species such as juvenile Chinook salmon and steelhead, recording the wide variety of prey items consumed, and observing how diet changes with the size of a fish.

STREAM HEALTH STUDIES

FISHBIO uses a variety of sampling methods to assess the conditions in a number of California streams. We take water quality measurements on site and also collect water samples for laboratory analysis. In addition, we sample streams for macroinvertebrates, conduct electrofishing surveys to estimate fish populations, and survey for vertebrates like snakes and salamanders. Our assessment also includes calculating the amount of sediment deposited in pools, profiling stream cross sections, estimating canopy cover, and counting large woody debris.

FISH RESCUES

Construction and development activities generally require a high level of attention and flexibility to ensure the activities comply with environmental regulations. FISHBIO has worked for numerous projects with unique regulatory requirements, including several major diversion replacements on the Sacramento River. Our field teams come equipped with solutions and creativity to perform activities efficiently and effectively.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