

# Connecting Research and Management to Sustain Migratory Fishes

## A proposed framework for scientific studies to inform fisheries management decisions in Cambodia and the Lower Mekong Basin

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*IFReDI staff setting an experimental gill net for fish monitoring in the Phat Sanday Community Fishery.*

### Purpose

The goal of this brief is to describe a fisheries research and adaptive management framework that can be implemented in Cambodia and other Lower Mekong Basin countries to improve outcomes for migratory fish species. This brief is based on the 2021 publication “Priority knowledge needs for management of migratory fish species in Cambodia” by Loury et al.



*An IFReDI field crew records data on fish captured in a research survey in Siem Pang.*

### Context

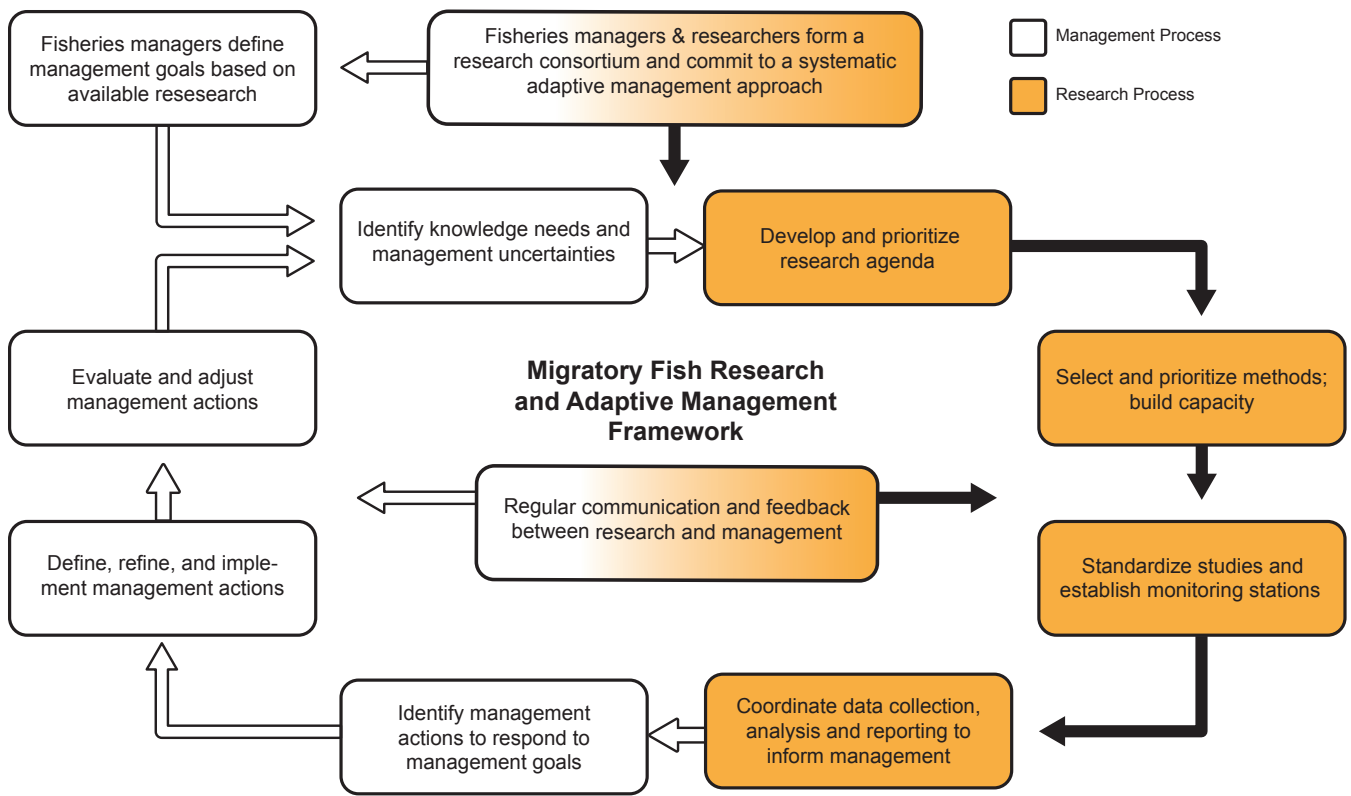
As development rapidly advances across Cambodia and the Lower Mekong Basin, managers and policy makers must regularly evaluate complex tradeoffs when making decisions about natural resources. Migratory fish species are particularly threatened by impacts to their migration routes and habitats, which can disrupt their life cycles. There is an urgent need for data on migratory fish biology, behavior, and physiology to guide more strategic dam placement, improve design of new infrastructure and mitigation measures such as fish passageways, and inform climate change adaptations. Better aligning migratory fish research studies to address management uncertainties can help provide the critical information managers need to make decisions that can sustain fish populations in the face of numerous threats.

A collaborative adaptive management process informed by research allows scientists and managers to work together to answer questions about migratory fishes and implement conservation measures. By committing to a systematic adaptive management approach, scientists and managers can ensure that research and monitoring activities directly address management needs, and that management responds rapidly and adjusts based on research and monitoring results. Integrating a migratory fish research framework across multiple countries in the Lower Mekong Basin would provide the most value for informing transboundary fisheries management.

### Migratory Fish Management Process

Each stage of the fisheries management process offers potential for interaction and feedback with researchers, as well as adaptation to new information. The management process can be continuously informed and guided by targeted research activities that assess management options, evaluate potential designs, determine effectiveness, monitor changes in circumstances, and recommend adjustments. This process can be connected to the steps of a migratory fish research framework shown in Figure 1.

1. A first step is for managers to **define management goals** for migratory fishes based on understanding of key threats and available research, such as goals to support migration or mitigate negative impacts.
2. Managers should next **identify management actions** and interventions that are most likely to succeed in meeting their goals.
3. Management actions can then be **designed, refined, and implemented** based on information from research and monitoring activities.
4. Once management interventions are implemented, it is important to **evaluate their effectiveness**, and **identify whether adjustments are needed** to improve management or to respond to changing conditions. This requires data on changes or trends in migratory fish populations over time.
5. As environmental conditions or management actions change, fisheries managers can **identify new knowledge needs** and management uncertainties that can help direct future research studies.



**Figure 1.** Components of a proposed Migratory Fish Research and Adaptive Management Framework showing the relationship between the processes of research (gold) and management (white).

### Migratory Fish Management Process

1. **Developing a research agenda** is a key first step to define priorities and develop studies to answer specific management questions. Activities can include both short- and long-term research studies, as well as long-term systematic monitoring.
2. Next, researchers should **select the most appropriate methods** to address research and monitoring objectives. Targeted training can be used to **build capacity** around selected tools and methodologies.
3. **Standardizing studies** and **establishing networks of monitoring stations** can ensure consistency and comparability among studies, which increases the power of individual data sets.
4. Establishing clear communication pathways between researchers and managers can help **coordinate data collection, analysis, and reporting** in ways that inform management. This can be facilitated by data sharing platforms, technical communique, and regular meetings and presentations.

### Development of a Migratory Fish Consortium

Migratory fish management in Cambodia is complex and multidimensional. Therefore, a multi-stakeholder group of government agencies, community fisheries groups, universities, NGOs and other entities would be best suited to implement and coordinate the proposed research framework. Establishing this consortium will be important to lay the foundation for the research framework in a collaborative manner.

A diverse, coordinated research program for migratory fishes is urgently needed to inform fisheries management and address the serious, but not insurmountable, challenges facing migratory fish species in the Lower Mekong Basin. The collaborative development and adoption of a proactive, long-term research agenda that includes a transparent adaptive management process will be a critical step to ensure that Cambodia’s migratory fish populations are sustained into the future.

### Want more information?

For additional details, please refer to the following publication:

Loury, E.K., V.L. Elliott, S.M. Ainsley, I.G. Baird, L.J. Baumgartner, S. Chhuoy, D.J. Lee, P.B. Ngor, B. Touch, A.V. Vu, and Z.S. Hogan. 2021. Priority knowledge needs for management of migratory fish species in Cambodia. *Fisheries Management and Ecology*. DOI: 10.1111/fme.12483