

## DESIGN OF FISHWAYS AND OTHER FISH FACILITIES

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*Annual Report of the Fishery Board for Scotland for the Year Ended ..* CRC Press

Many fish species, like salmon and sturgeon, undertake extended migrations as part of their basic behavior, and other fish and invertebrates also undertake short-term or small-scale migrations at certain phases of their life cycles. Activities such as dam construction for water supply and power generation, channelization for navigation and flood control, land drainage and wetland reclamation for agricultural and urban use all have profound impact on the aquatic ecosystem and thus on natural fish populations. Fish passes are often the only way to make it possible for aquatic fauna to pass obstacles that block their up-river journey. Based on knowledge and experience from mainly Europe and North America, this book describes the various types of fish passes, with special emphasis to "close-to-nature" solutions.

*Hydropower Relicensing, Box Canyon Hydroelectric Project, Washington and Idaho* Food & Agriculture Org.

The 2014 International Conference on Water Resource and Environmental Protection [WREP2014] aims to bring researchers, engineers, and students to the areas of Water Resource and Environmental Protection. WREP2014 features unique mixed topics of Water Resource and Environmental Protection in the context of building healthier ecology and environment. The conference will provide a forum for sharing experiences and original research contributions on those topics. Researchers and practitioners are invited to submit their contributions to WREP2014. This proceeding tends to collect the up-to-date, comprehensive and worldwide state-of-art knowledge on water resource and environmental protection. All of accepted papers were subjected to strict peer-reviewing by 2–4 expert referees. The papers have been selected for this proceedings based on originality, significance, and clarity for the purpose of the conference. The selected papers and additional late-breaking contributions to be presented will make an exciting technical program on WREP2014 conference. The conference program is extremely rich, featuring high-impact presentation. We hope this conference will not only provide the participants a broad overview of the latest research results on water resource and environmental protection, but also provide the participants a significant platform to build academic connections.

**Federal Energy Regulatory Commission Reports** Food & Agriculture Org.

This new edition of the best-selling book describes the main types of fishways and fish facilities used around the world to assist the passage of fish over dams and other obstructions to their migration. It also focuses on the protection of fish (mainly young fish) from the hazards encountered in their downstream migrations. The book brings together the type of knowledge and research needed to decide on the facility used as well as its design and operation. It emphasizes the need for both biologists and engineers to collaborate in the design and indicates in what fields such collaboration would benefit fisheries conservation in the future. This is the Second Edition of the only book to bring together all of these topics worldwide under one cover.

Fish passage technologies : protection at hydropower facilities. CRC Press

This study on the effect of fishway slope on rate of passage of salmonids was made by comparing passage time of fish in two fishways with different slopes. It is based mainly on steelhead (*Salmo gairdneri*) but includes some chinook (*Oncorhynchus tshawytscha*) and silver (*Oncorhynchus kisutch*) salmon. Both fishways were pool-and-overfall type in which 6 feet of elevation was gained. Passage of steelhead in the 1:8-slope fishway was in general, as fast as or faster than in the 1:16-slope fishway. In the 1:8-slope fishway, the passage time appeared to increase with an increase in rise between pools. In the 1:16-slope fishway, the passage time of steelhead increased as the season progressed.

Social-Ecological Restoration in Paddy-Dominated Landscapes DIANE Publishing

The success of fish migration through culverts is dependent on the swimming ability of the fish and the hydraulic conditions of the culvert. Properly designed and constructed culverts can minimize the impact on fish passage. Because culverts are typically more economical than bridges, it is appropriate to evaluate when to use culverts and to predict the effects of such culvert installations. During the consideration of alternatives for structures for fish passage, culverts should not be automatically eliminated. This publication has tried to examine the aspects of culvert design and operation relative to the existing information that has been published in previous studies. Ideally, a culvert installation should not change the conditions that existed prior to that installation. This means that the cross-sectional area should not be restricted by the culvert, the slope should not change, and the roughness coefficients should remain the same. Any change in these conditions will result in a velocity change which could alter the sediment transportation capacity of the stream. A truly successful culvert design would include matching the velocities of the fish's swimming zone in the culvert to the swimming capacity of the design fish. Unfortunately, not enough research has been completed to make this an acceptable criterion of culvert design. This approach is preferred because it is easier to reduce the velocities in the swimming zone by increasing the boundary roughness than it is to reduce the mean velocity of the entire culvert. This publication contains some relatively simple guidelines which can reduce the installation problems of culverts in streams containing migrating fish when combined with the expertise of an experience fish biologist, engineer, and hydrologist.

Design of Fishways and Other Fish Facilities Food & Agriculture Organization of the UN (FAO)

This report showcases examples of actions taken by small-scale fishers and aquaculture farmers in Asia to restore the productivity of aquatic ecosystems. Small-scale fishers and fish farmers include some of the world's most marginalized and impoverished people groups, yet their harvests account for over half of the world's aquatic food production. The marine, coastal and freshwater ecosystems their livelihoods depend upon are degraded from human impacts and further at risk from climate change. Ecosystem restoration actions by fisherfolk communities can revitalize the socio-ecological services and sustain progress over time. Both passive and active restoration approaches are being employed across Asia's marine, coastal and inland waterways. Fishers, fish farmers, and fishworkers' restorative actions are focused on increasing the sustainability of their operations. Common approaches include eliminating destructive fishing, reducing overfishing through gear changes and effort control, restoring connectivity of floodplains and fish migration pathways, integrated aquaculture and rice-farming practices, re-stocking of native fisheries, and actively rehabilitating and / or re-establishing habitats. Progress is measurable through a diverse array of environmental, socio-economic and governance related metrics. Changes in fisheries catches, ecological connectivity, water quality, habitat diversity and structure, and fish consumption provide important measures of biodiversity gains (or losses). Common enablers of success include economic incentives, co-management and legal recognition of fishing rights, highly engaged fisherfolk cooperatives or community groups, women's leadership and development, and community partnerships with stakeholders that focus on enabling fisherfolk's own goals for sustainable livelihoods. Ecosystem restoration activities have not lasted when these enablers are insufficiently attended to and when environmental aspects of project feasibility, such as the choice of rehabilitation locations and / or species, are poorly planned. Successes in ecosystem restoration by fisherfolk can and are being scaled out to neighbouring communities and countries. Key to this is the sharing of stories, lessons learned and tools through south-south partnerships, learning exchanges, and women's groups. Simple, low-cost tools and actions have enabled long-term engagement by small-scale fishers in sustainable operations. More complex actions, such as the uptake of integrated aquaculture systems, are also enabling stepwise changes in ecosystem restoration. By sharing stories from different ecosystems, fisheries, and geographies, this report seeks to help fisherfolk and their partners glean from one another and achieve faster progress in ecosystem restoration.

New Trends in Water and Environmental Engineering for Safety and Life Department of Fisheries

The focus of this report is technologies for fish passage around hydropower generation facilities and protection against entrainment and turbine mortality. Emphasis is given to Federal Energy Regulatory Commission (FERC)-licensed hydropower projects where fish protection is a subject of controversy and congressional interest due to the Federal Power Act (FPA) and the Electric Consumers Protection Act (ECPA). Thus institutional issues related to FERC-relicensing are also discussed. (Major points of controversy are high-lighted in box 1.1).

Annual Report of the Fishery Board for Scotland DEStech Publications, Inc

Most of the diadromous fish of the world have decreased in distribution and abundance since the beginning of the twentieth century. They are now threatened, and important conservation issues arise. The causes of these trends vary among species and basins but regional human impact (damming, pollution, fisheries) and global change (climate) are suspected to be responsible for these difficulties. This book contains selected papers from an international symposium organised by the Diadfish network held in Bordeaux (France) in 2005. Readers will find up-to-date information on the ecology, ecotoxicology and physiology of several diadromous species (Atlantic salmon, shads, lampreys, eels) and this whole group in Europe. Main impacts are also documented and analysed in case studies, and solutions or remediation actions are presented.

Microhematocrit as a Tool in Fishery Research and Management Design of Fishways and Other Fish Facilities

This volume looks at recent scientific knowledge and innovative techniques concerning environmental matters. The proceedings focus on topics such as hydraulic protection of territory and defence, utilization of water resources, architecture and planning of fluvial/coastal landscape and much more.

The Iowa Engineer Springer Science & Business Media

Fisheries in inland waters have long provided an important source of food for mankind. One way to make the use of these resources sustainable and to improve food security and livelihoods is through the development of sustainable fisheries management practices. This book is a compilation of modern knowledge on all aspects concerning the planning and construction of fishpasses as well as their monitoring for effectiveness. Emphasizing the need to take into consideration biological and behavioral characteristics of the species, it describes in detail the engineering options that are available today to make obstacles passable.--Publisher's description.

Klamath Hydroelectric Project, FERC Project No. 2080-027, Oregon and California LAP Lambert Academic Publishing

With a focus on environmentally friendly rice farming, this unique book integrates both ecosystem and human dimensions of ecological restoration to provide strategies to promote sustainable agriculture and rural development. Paddy fields have multiple functions beyond their role of producing rice: They serve as refuge habitats for a range of wildlife that once inhabited floodplain wetlands and contain a number of unique and threatened aquatic species. They also provide various ecosystem services for regional communities such as water retention, erosion control, flood control, fish culture, and educational opportunities. However, rice paddies are threatened worldwide due to the modernization of agriculture and abandonment of farmland caused by depopulation and the aging of rural communities. Therefore, multiple ecological and sociological aspects must be considered in the ecological restoration of paddy fields. This book aims to do so by incorporating various disciplines of natural and social sciences. Strategies for sustainable agriculture are reviewed, including financial incentives for farmers and the use of flagship wildlife species such as the crested ibis (toki) to promote ecological restoration. With the increasing popularity of environmentally friendly rice farming in parts of Asia and the western United States, this book offers model cases for sustainable management of paddy-dominated landscapes.

National Energy Security Act of 1991 Springer

This new edition of the best-selling book describes the main types of fishways and fish facilities used around the world to assist the passage of fish over dams and other obstructions to their migration. It also focuses on the protection of fish (mainly young fish) from the hazards encountered in their downstream migrations. The book brings together the type of knowledge and research needed to decide on the facility used as well as its design and operation. It emphasizes the need for both biologists and engineers to collaborate in the design and indicates in what fields such collaboration would benefit fisheries conservation in the future. This is the Second Edition of the only book to bring together all of these topics worldwide under one cover.

Special Scientific Report Office of Technology Assessment

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Construction of dam and barrier in stream cut off the migration passage of varieties of fishes and aquatic lives. Different types of fishways were accommodated to those dam and barrier, however less were successfully adopted by fish and aquatic species. It is presumed that flow conditions and entrance environment of those fishway are not suitable and adequate. The author carried out hydraulic experiments with various shapes and sizes of appurtenance in fishway and observed different flow phenomena. Hydraulic experiments are also conducted in sloping channel to compare them with fishway. This book will help to understand the flow scenarios to improve design of pool-and-weir fishway.

Final Environmental Impact Statement for Hydropower License Food & Agriculture Org

The importance of free longitudinal passage of river fauna is stressed.

Report of the Bureau of Commercial Fisheries

Design of Fishways and Other Fish FacilitiesCRC Press

Current Affairs Bulletin

Includes section, "Meetings and conferences."

Design of Fishways and Other Fish Facilities : Including Fish Locks, Fish Elevators, Fences and Barrier Dams, Fish Screens, Artificial Spawning Channels

Dams, Fish and Fisheries

Fishways