

Preface

Among the roughly 30,000 species of fish, migratory species account for only 165 species, but they show very interesting biological phenomena and life histories. Most migratory fishes are very important fisheries resources. Migratory fishes move either alone or in schools from their birth place to their growth habitats, and then usually return to their place of birth for reproduction. These migrations allow fishes not only to exploit different food availabilities and to adapt to environmental changes, but also to regulate population density and widen their distribution.

In general, fish migrations are classified into three categories; "Recruitment" migrations from juvenile nursery area to adult habitat, "Contranatant" and "Denatant" migrations between adult habitat and adult spawning areas, and "Drift" or "Denatant" migrations from adult spawning area to juvenile nursery area (Harden-Jones 1968) (Fig. 1). These migrations form a migration loop (Tsukamoto et al. 2002). There must be very important initiation (triggering) and adaptation mechanisms that make it possible for fish to migrate from juvenile nursery area to adult habitat and from adult habitat to adult spawning area, but many of these mechanisms remain a mystery.

The recent rapid development in biotelemetry techniques, such as ultrasonic and radio telemetry, data logging and pop-up satellite telemetry, make it possible to investigate wild fish behavior both in freshwater and seawater. Following on from the Conference on Fish Telemetry organized in Europe that had been held in Belgium in 1995, France in 1997, United Kingdom in 1999, Norway in 2001, Italy in 2003, Portugal in 2005, Denmark in 2007, and Sweden in 2009, the memorable 1st International Conference on Fish Telemetry (ICFT) was held in Japan in 2011. Many authors of this book, *Physiology and Ecology of Fish Migration*, presented their most updated, innovative researches in the 1st ICTF. This book is a part of the conference proceedings.

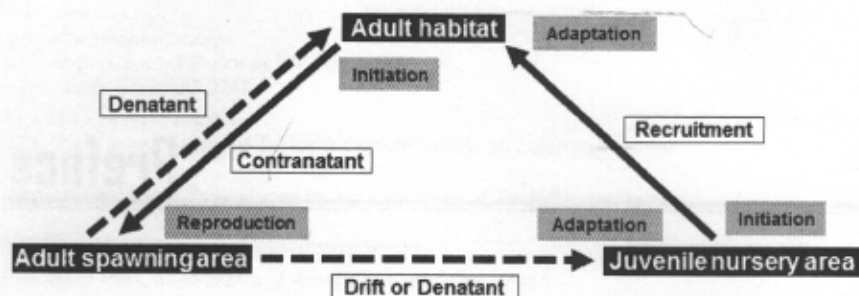


Fig. 1. Migration loop of fish. Revised form Harden-Jones 1968.

Each chapter deals with the following topics:

Chapter 1: Physiology of imprinting and homing migration in Pacific salmon

Chapter 2: The behavior and physiology of migrating Atlantic salmon

Chapter 3: The onset mechanism of the spawning migrations of anguillid eels

Chapter 4: Marine migratory behavior of the European silver eel

Chapter 5: Sea lamprey migration: a millennial journey

Chapter 6: Migratory behavior of adult Pacific lamprey and evidence for effects of individual temperament on migration rate

Chapter 7: Behavioral ecology and thermal physiology of immature Pacific bluefin tuna.

We sincerely hope that this book will contribute to promote a better understanding of the physiology and ecology of fish migration.

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References

- Harden-Jones, F.R. 1968. *Fish Migration*. Arnold Press, London. UK.
 Tsukamoto, K., J. Aoyama, and M.J. Miller. 2002. Migration, speciation, and the evolution of diadromy in anguillid eels. *Can. J. Fish. Aquat. Sci.* 59: 1989-1998.