

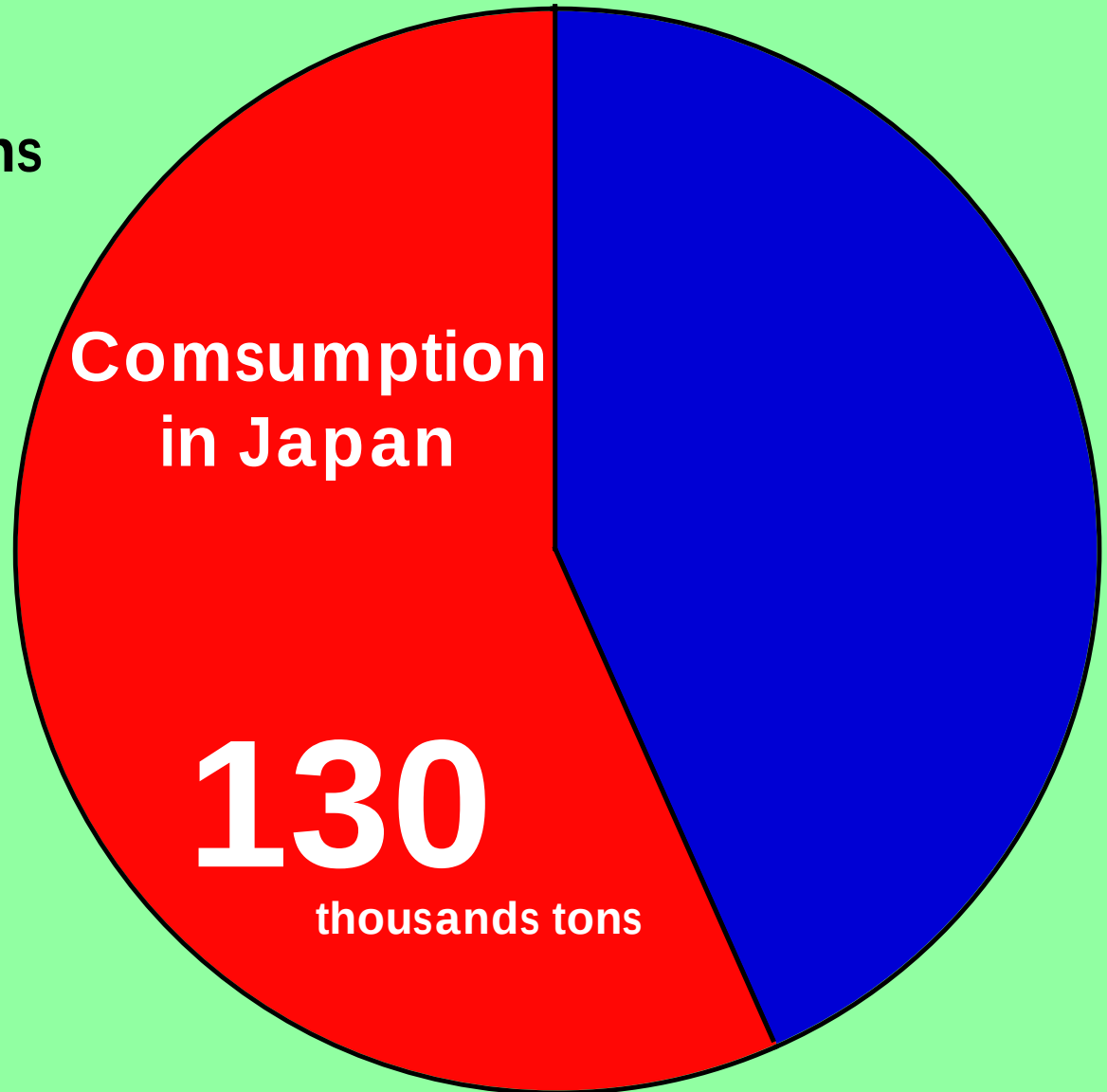
An initial investigation of the biological characteristics of the Japanese eel stock in Japan

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Eel Production in the world in 1996

229 thousands tons



(Annual report of Fisheries and Aquaculture 1999)

Scientific Papers (Web of Science 1994-2003)

Keywords	Japanese eel	European eel
Genetics	11	23
Otolith	58	18
Migration	45	74
	114	115
Fisheries	14	69
Management	0	26
	14	95

Ecological, Biological Interest > Resource Management

Fisheries Regulation
Habitat Restriction
Restocking

Season?? Size?? Habitat??

**Absence of valid biological
information for stock managements**

Japanese Fisheries Agency

Studies for Inland Fishery Resource Management
5 years from 1999

University of Tokyo

9 Prefectural Fisheries Center

Japan Fisheries Resource Conservation Association

IBARAKI

CHIBA

AICHI

TOKUSHIMA

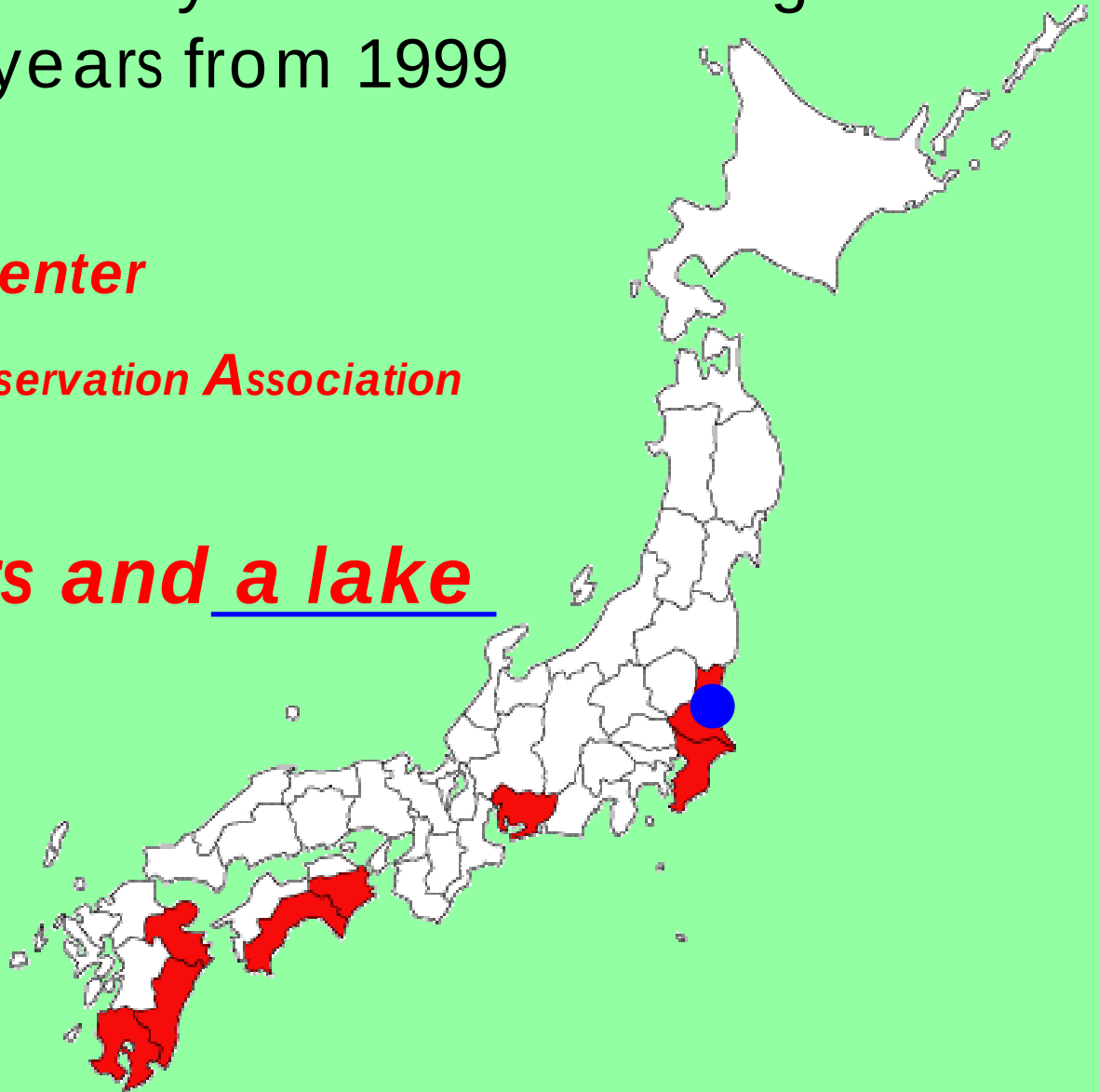
KOUCHI

OHITA

MIYAZAKI

KAGOSHIMA

13 rivers and a lake



Methods

Eel pods

Long-line

Set net

Traditional traps

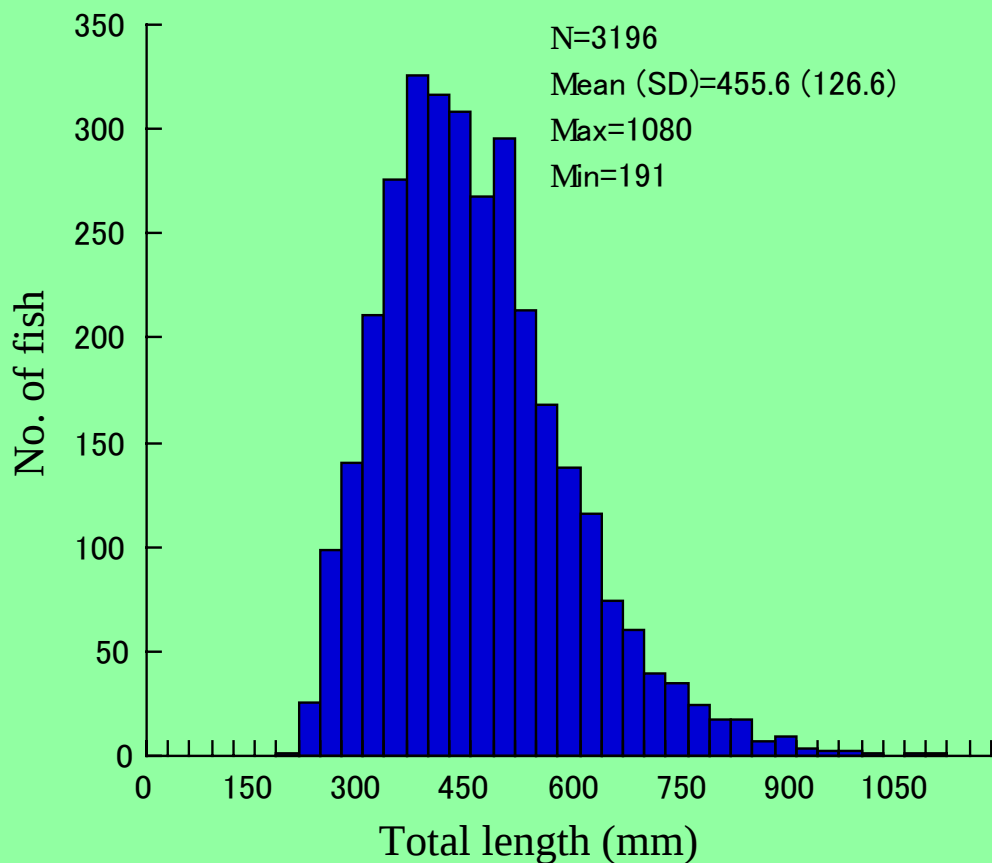


Size, GSI, HSI, Age, Sex, Oocyte development etc.
Environmental factors

Results during 1999-2001

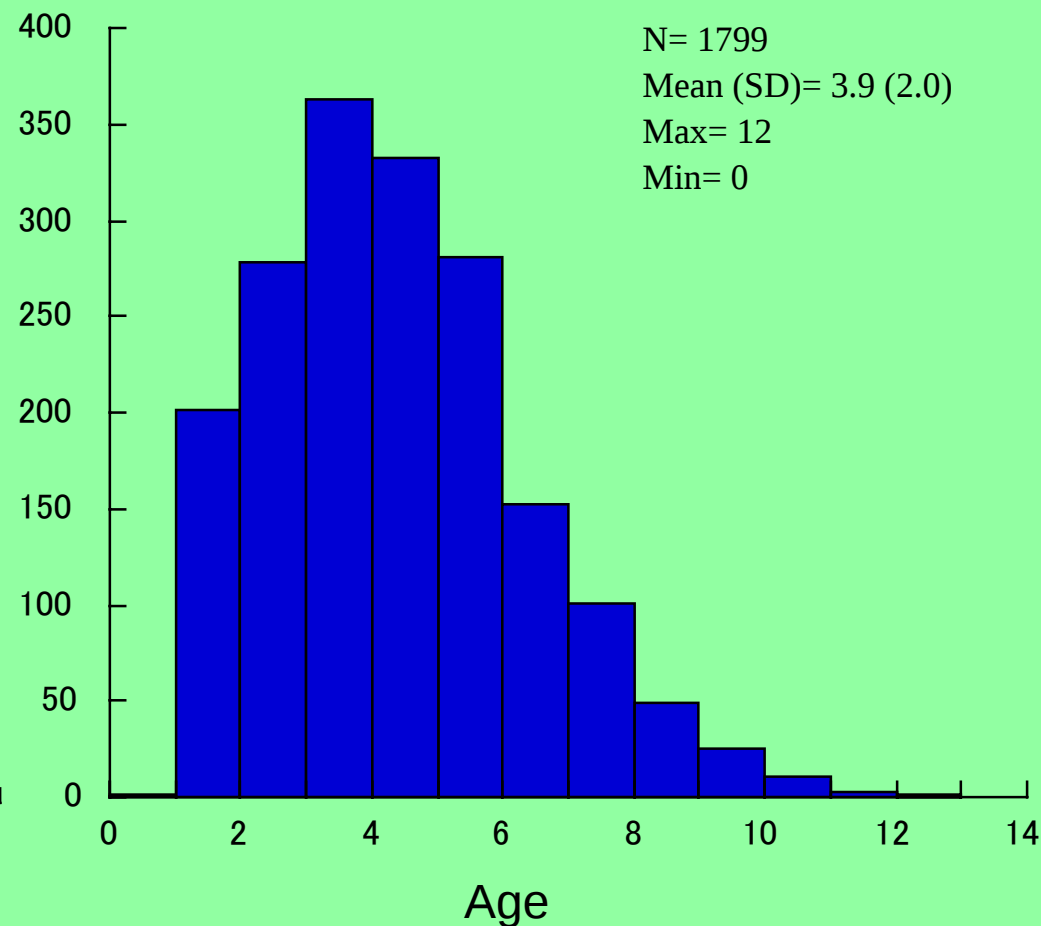
Total 3196 eels

Total length



46 cm

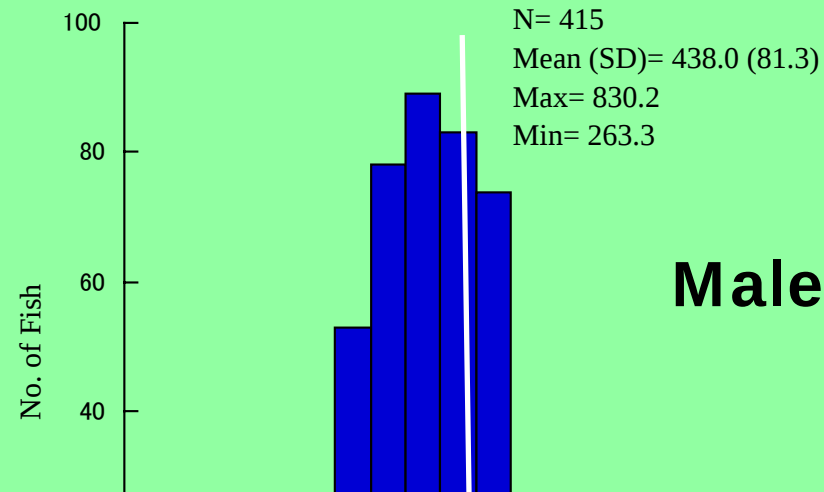
Age



3.9 years

Sex

N=3196

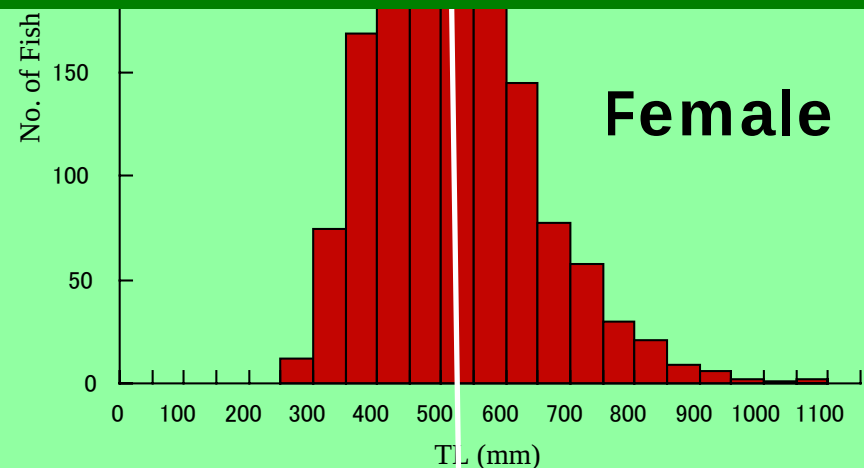


Males are relatively dominant and large.

Unknown
38.1 %

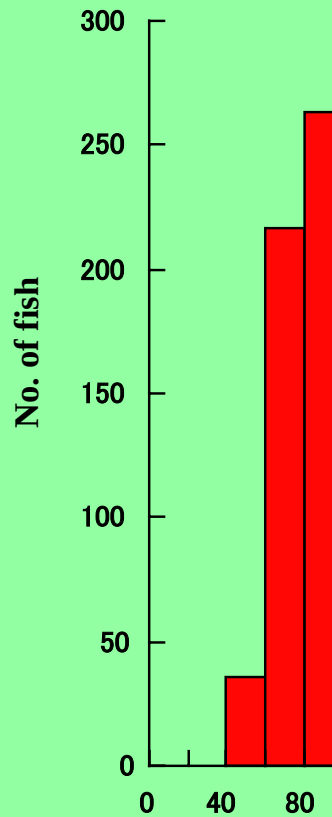
Male
13.0 %

(>90% female; Tzeng et al. 1995)



Growth

Female



European Eel

30-60 mm/year (See Moriaty 2003)

American eel

30-94 mm/year (See Oliveira 1999) 9 (82.3)

New Zealand eels

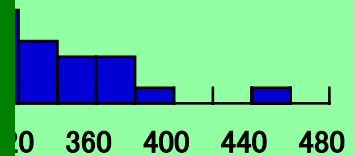
10-60 mm/ years (Jellyman 1997)

Female > Male

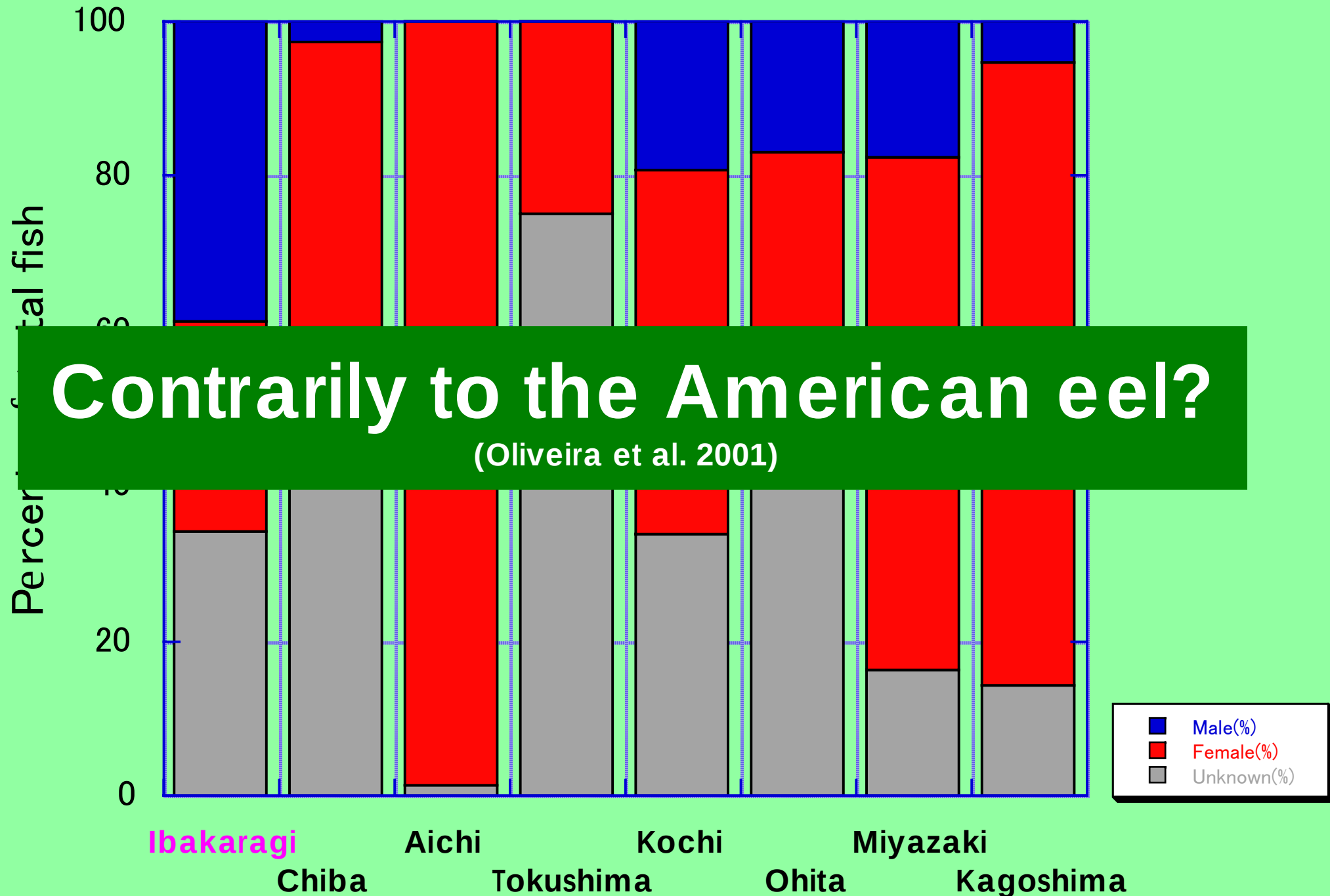
Higher growth rate??

Males grow faster ??

10



Local difference in sex ratio

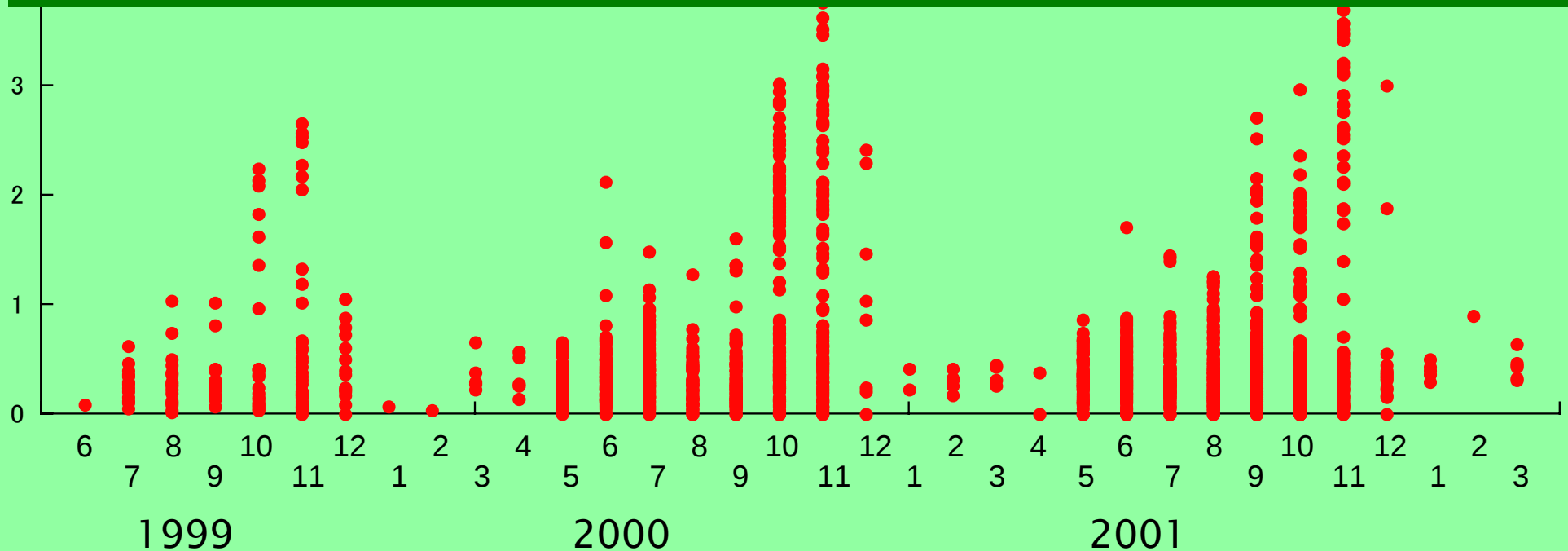


Seasonal changes in GSI

GSI

6

Downstream Migration: Oct. - Nov.



Significances of the present study

Reference stock condition for future study

Can we simply follow the EIFAC policy?

NOT!!

Japanese eel specific characters

Glass eel catch

Europe: Critical decline (less than 1%)

Japan: Decrease but a certain level (20%)

Habitat Restoration

Europe: Considerable (EIFAC 2002)

Japan: Very few

Increase the spawner stock

Urgent Needs!

Long term monitoring at International level using standardized method.

Periodical standardized monitoring at some sites in all east Asian countries

Detailed information about growth phase that is comparable to oceanic larval phase.

Participants in the present study

Research Members

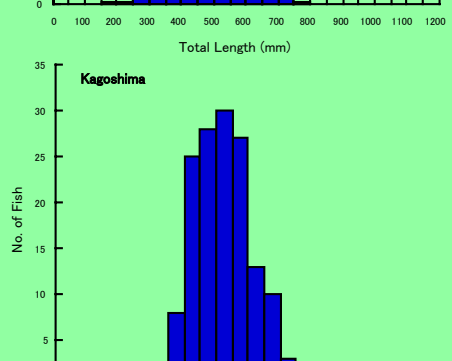
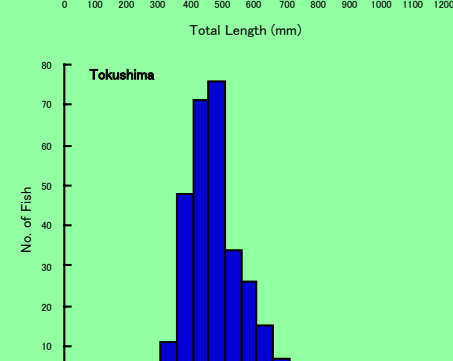
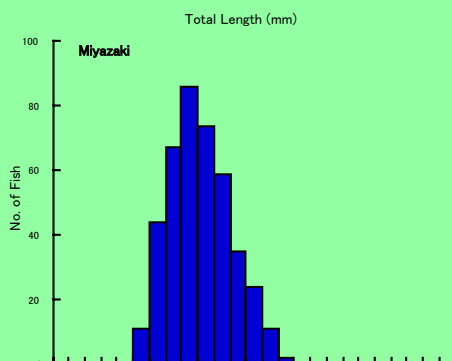
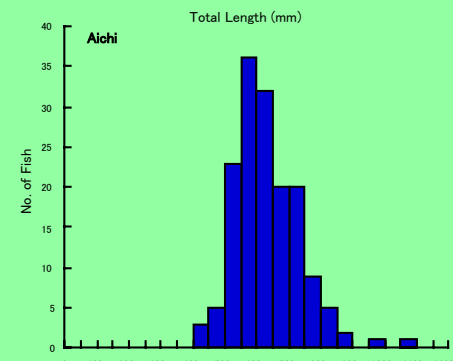
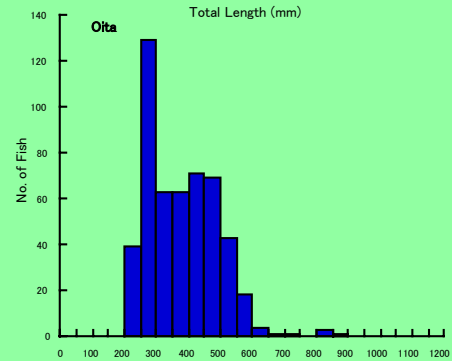
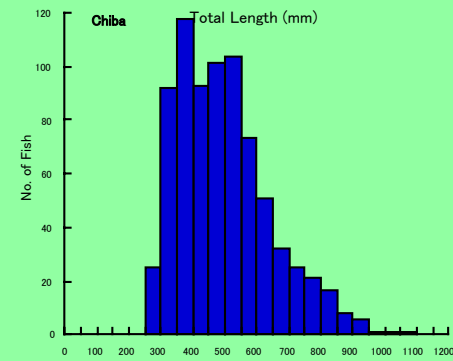
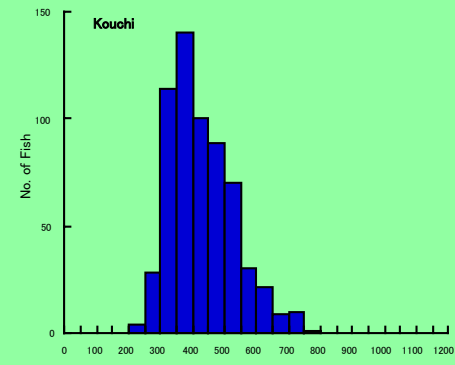
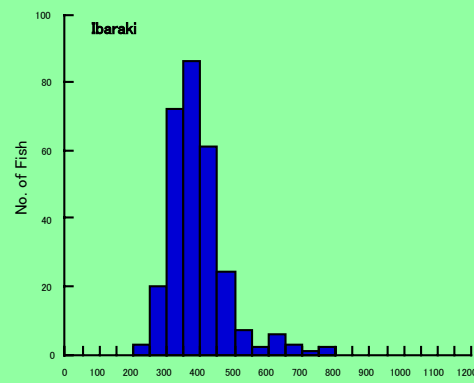
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S. Yamamoto (Kagoshima)

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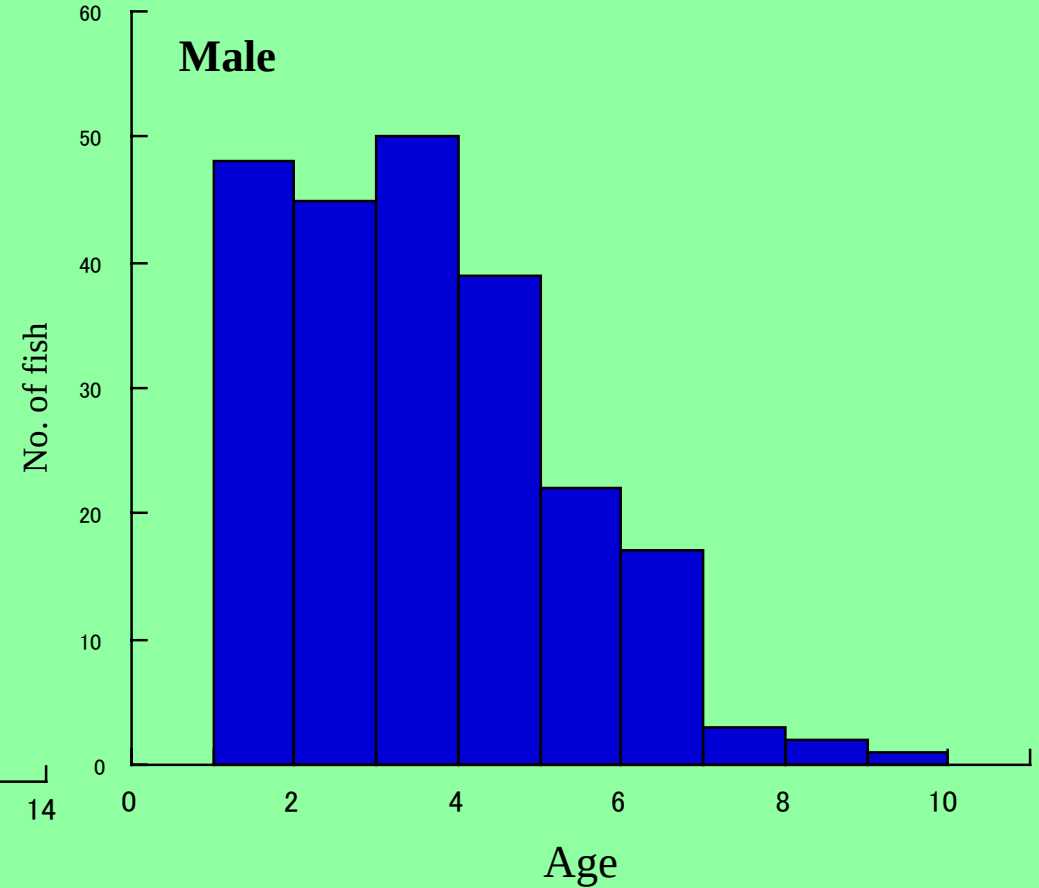
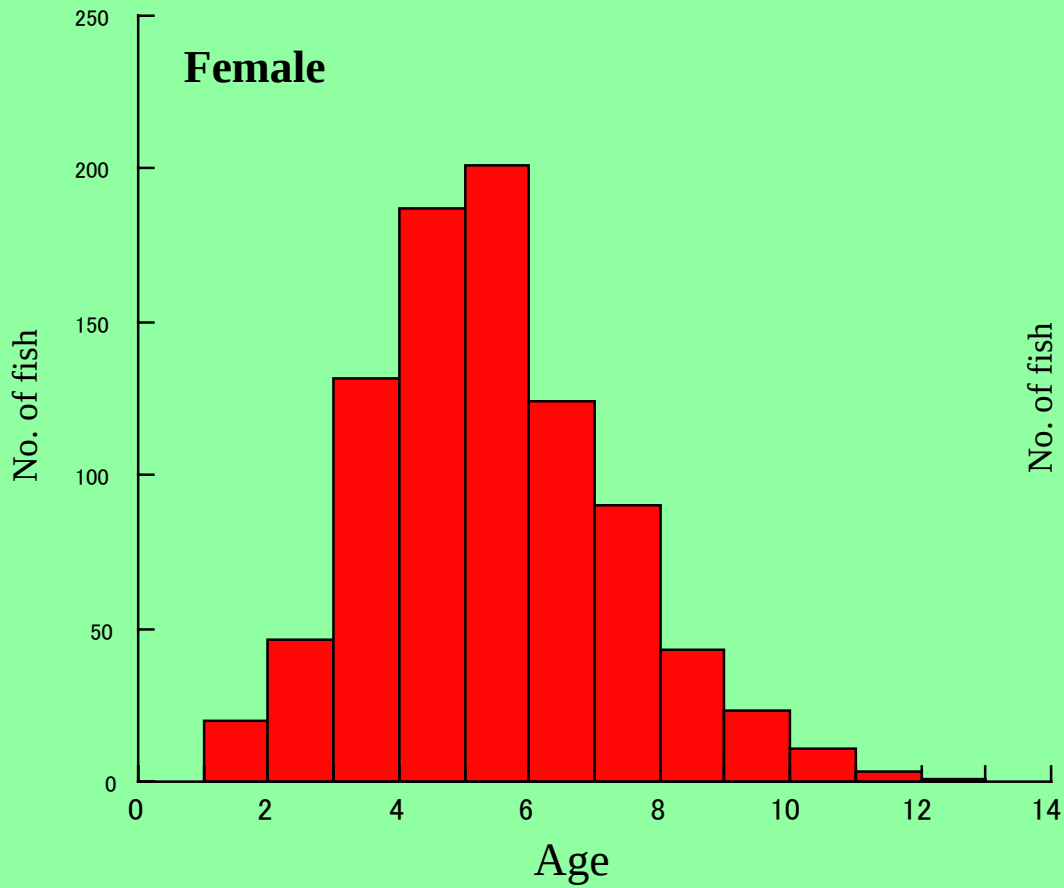
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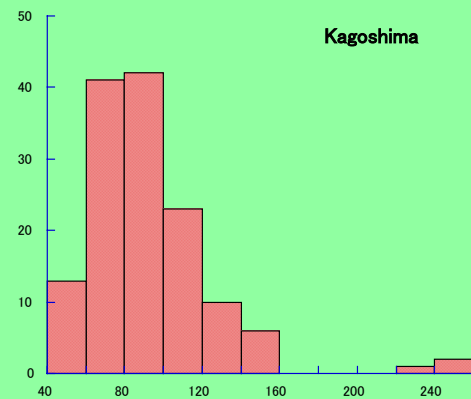
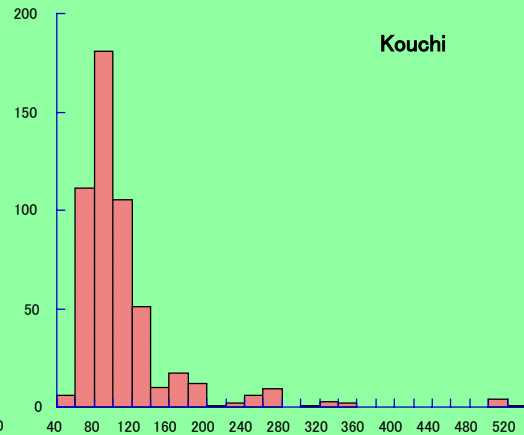
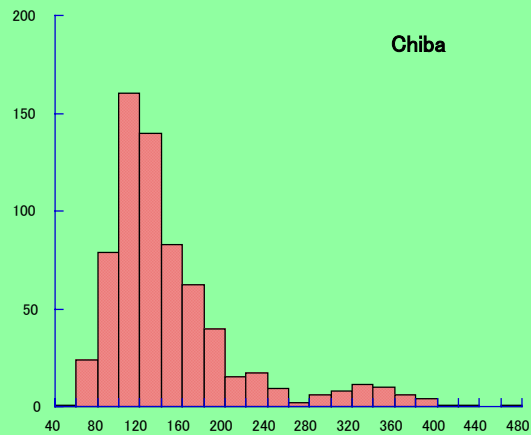
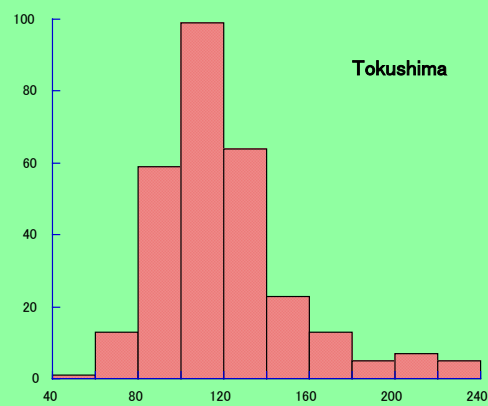
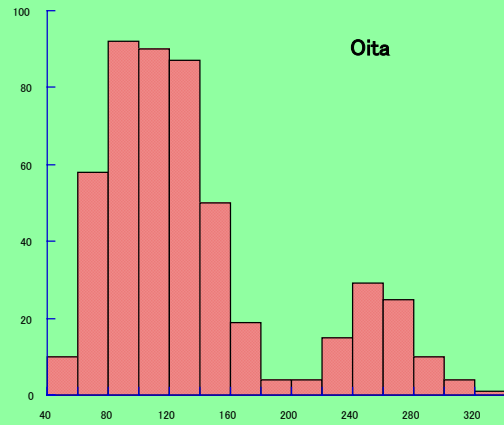
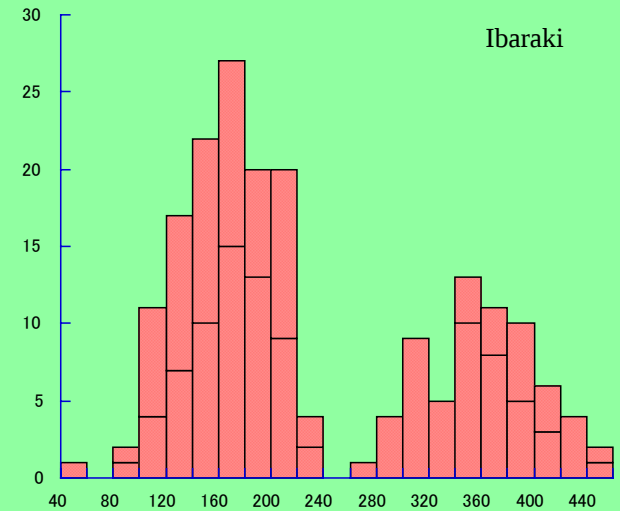
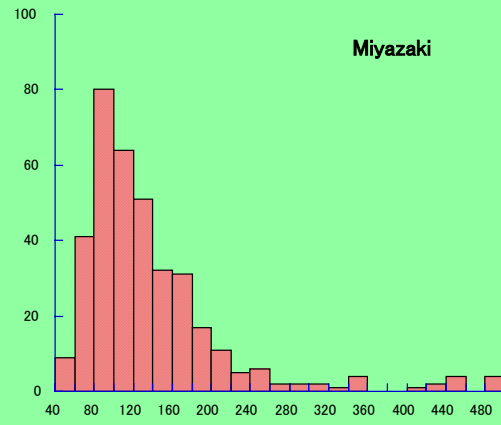
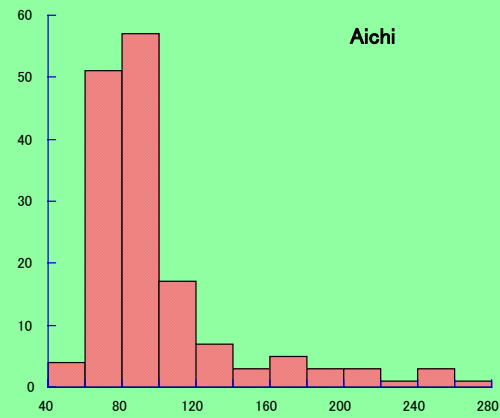
Total length difference in localities



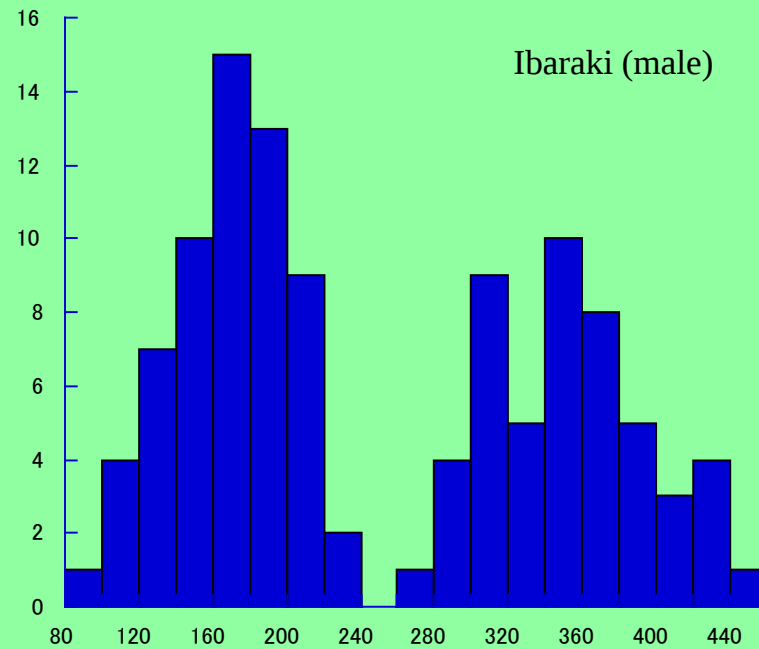
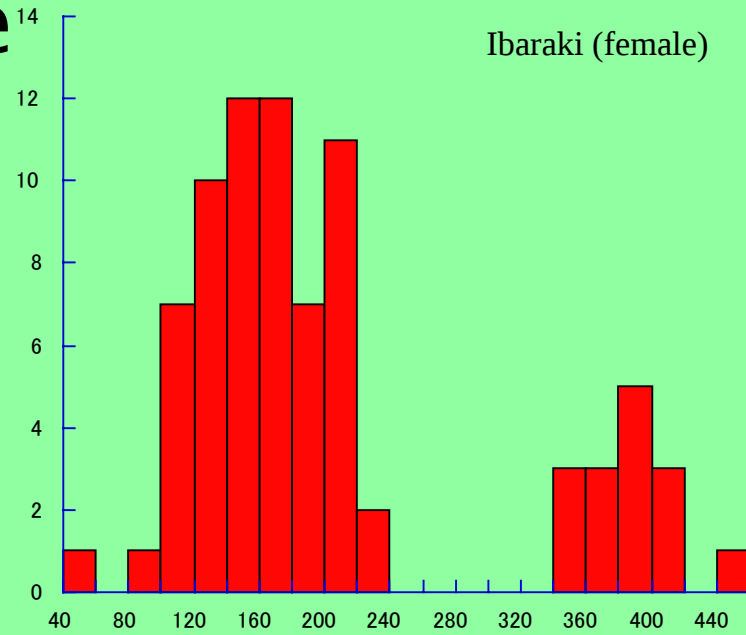
Age distribution



Growth Rate



Growth Rate

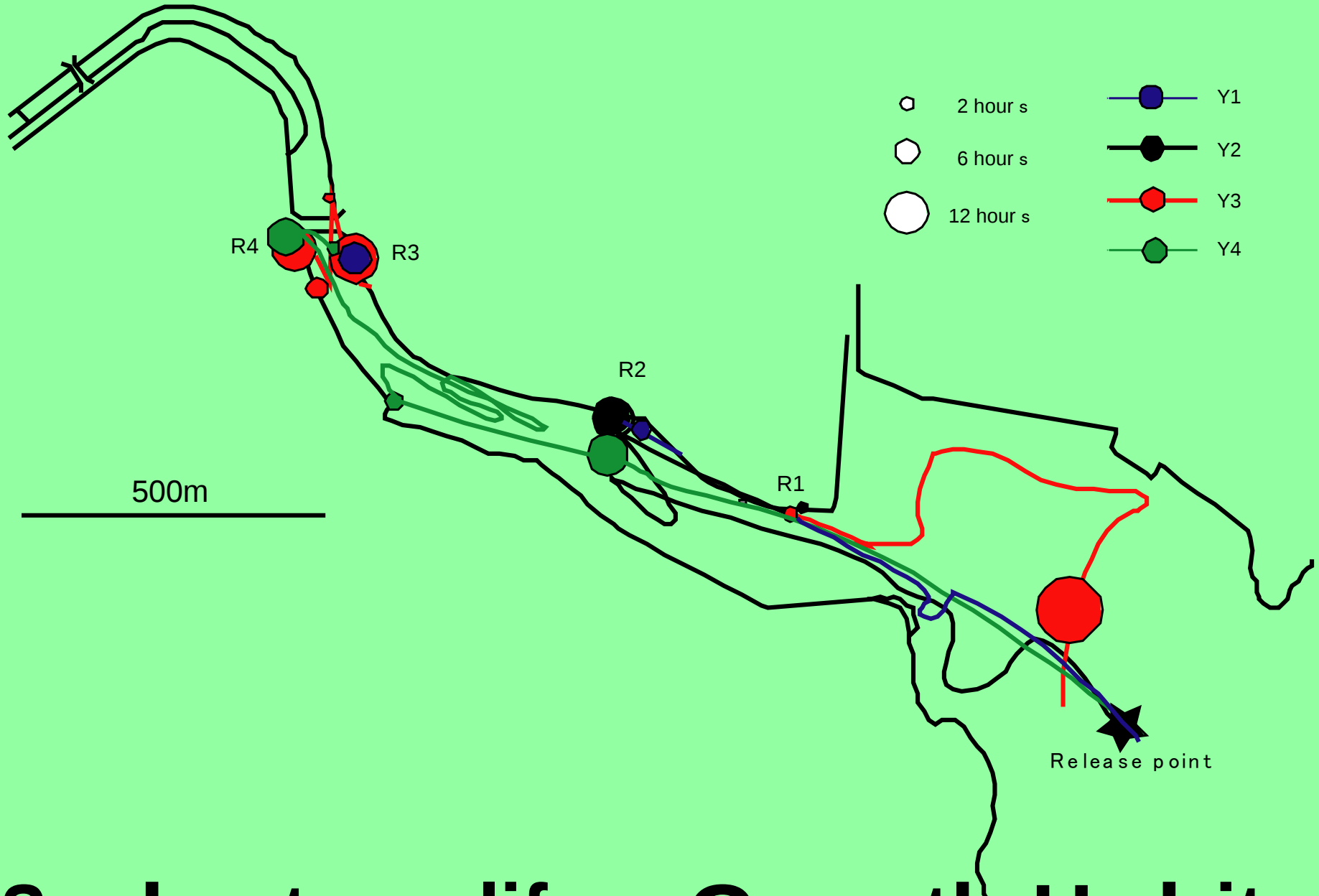


1. Actually growth rate is so high??

2. Males grow faster??

- **How many restocked eels are in the sample?**
- **Otolith rings are formed annually?**
- **Restocked eel (male dominant stock)**
↓
Miss-aging particularly in males
- **Habitat specific traits (Lacustrine)**
Male dominant, faster growth

Tracking Study in Fukui River, Tokushima



Sedentary life: Growth Habitat