My background

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- Supervisor: Dr. Ding Wang
- Institute: Institute of Hydrobiology, CAS
- Subject: Ecology, Conservation biology of the Yangtze freshwater cetaceans

Quickly population decline of the Yangtze finless porpoise, *Neophocaena phocaenoides asiaeorientalis*

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Outline

- Introduction to the Yangtze Cetaceans
- Questions & Ideas
- Implications for the conservation
- Acknowledgement

Introduction to the Yangtze Cetaceans

- China was the one of eight richest biodiversity areas of world (McNeely, 1990).
- But it was also one of the most biodiversity damaged areas (Liao, 1998).

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Introduction to the Yangtze Cetaceans

Several thousands in hundreds of years ago

early 1990s

Functional extinction in 2007

Last hope for river dolphins

The world's most critically endangered cetacean, the Chinese 'baiji' river dolphin, may finally have a chance of being saved from extinction. But it could be too late; researchers who carried out a nine-day pilot search for the dolphins last month didn't find a single one.

The freshwater baiji (*Lipotes vexillifer*) once thrived in their only habitat, the Yangtze River, which runs though central China. But fewer than 100 dolphins are thought to be left in the river, which has become a busy, polluted highway. "If the giant panda is China's symbol of the destruction of forests, the baiji stands for polluted waters," says Wang Ding, from the Wuhan Institute of Hydrobiology.

An international team of scientists, led by Ding, is hoping to catch the animals and release them in a safer place, possibly the Shishou reserve, which is a 20-kilometre arm off the Yangtze.

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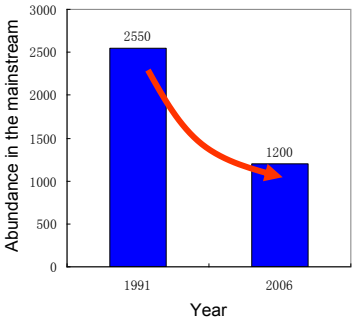
Introduction to the Yangtze Cetaceans

- Yangtze finless porpoise is the only freshwater subspecies of *Neophocaena*.
- Struggle with all of the threats as Baiji.
- Only 1800 in 2006.
- Critically endangered.



Population decline of the finless porpoise in the Yangtze River

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What should I do for these lovely animals?

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Questions & Ideas

Questions by the publics

- 1800, How less?
- What's the future? (Trends)
- What should we do?

Questions by the scientists

- Status on the IUCN Red list?
- Main threats?
- Why so quickly?

Q1: Trends?

- **PROXIMAL: explaining/describing** proximal observations based on **structured data** (ex. N estimates)
- **ULTIMATE: predicting ultimate** results, **trends** in evolution and ecology (TREE), usually based on very **limited data** (ex. Projecting trends)
- Generally: **PROXIMAL → ULTIMATE**

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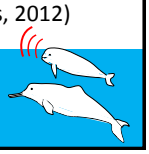
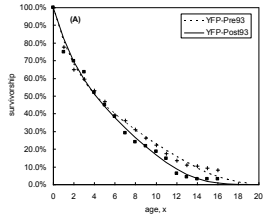
Q1: Trends?

- Data collection
  - ✓ IHB collected the death porpoises ever since 1978
  - ✓ Body length, age, sex, date, location, etc.
  - ✓ 279 samples
- Modeling
  - ✓ 1993
  - ✓ Life tables (Krebs, 1989)
  - ✓ Individual-based Leslie matrix model

(Mei et al. Biol Cons, 2012)



Q1: Trends?



- **Comparative study on life tables**
- **Before 1993**

  r = -0.0149 (SD=0.0144)
- **After 1993**
- **r = -0.0637 (SD=0.0525)**

Accelerated decline

(Mei et al. Biol Cons, 2012)

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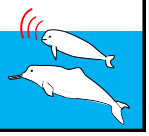
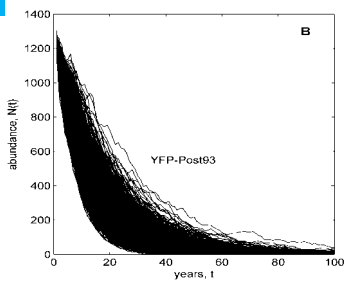
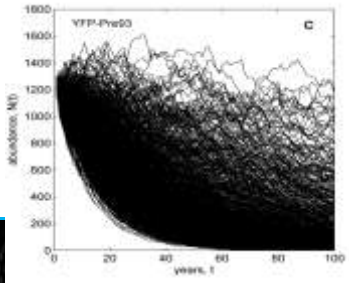


Q1: Trends?





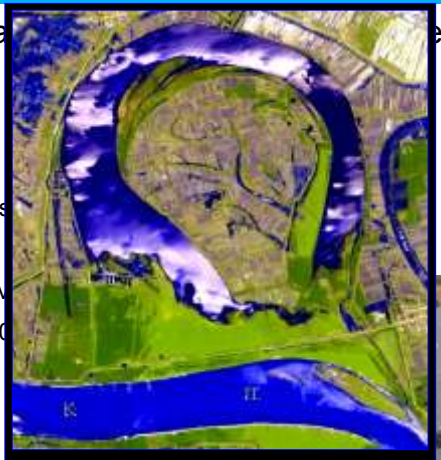
- PE_{100} =86.06%, TE = 61.8 (SD = 22.4 years)
- DN_{3T0} > 80%
- Next 15 years
- NT→VU→**EN**→**CR**→EX

(Mei et al. Biol Cons, 2012)

Q2: What affect?

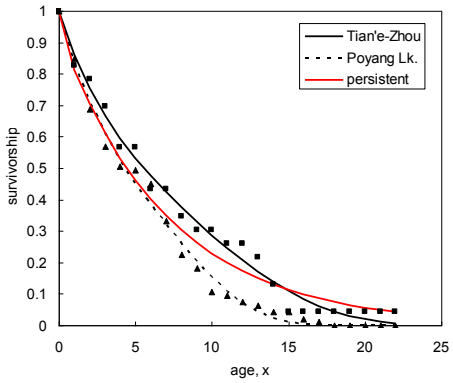
Comparative resea eserve populations

- ✓ Study area
  - Poyang Lake
  - Tian-E-Zhou s
- ✓ Method
  - Captured surv
  - Rescue in 20
  - Life tables



Satellite image of the Tian-E-Zhou oxbow

Q2: What affect?



- **Adult survival rates: Poyang Lake < Tian'e Zhou**
- **r estimates:**

Tian'e Zhou (0.0355, SD 0.0138)

Poyang Lake (-0.0485, SD = 0.0201)

Q3: Why so quickly?

Shortage of food resources

Degradation and Loss of Habitat

Direct impacts

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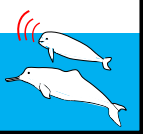
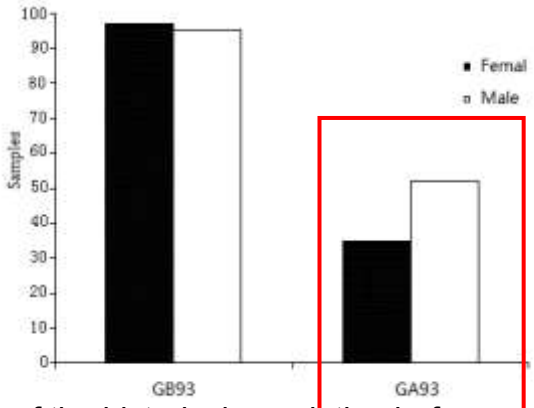
Q3: Why so quickly?

Compared life history parameters before and after 1993

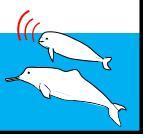
	T_0	r
Pre93	8.96 (SD 0.430)	-0.0159 (SD 0.0135)
Post93	7.93 (SD 0.413)	-0.0625 (SD 0.0169)



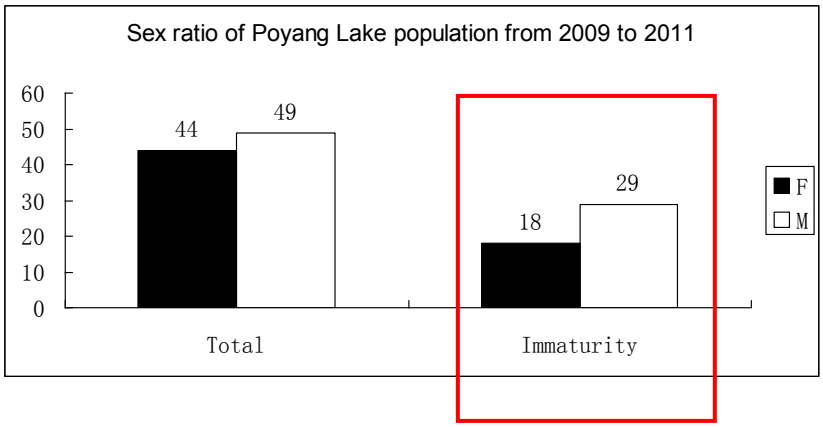
Q3: Why so quickly?



Sex ratio of the historical population before and after 1993



Q3: Why so quickly?



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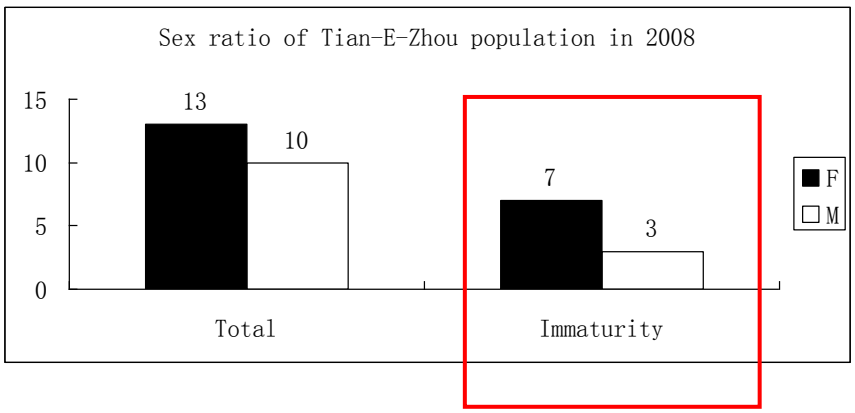
Q3: Why so quickly?



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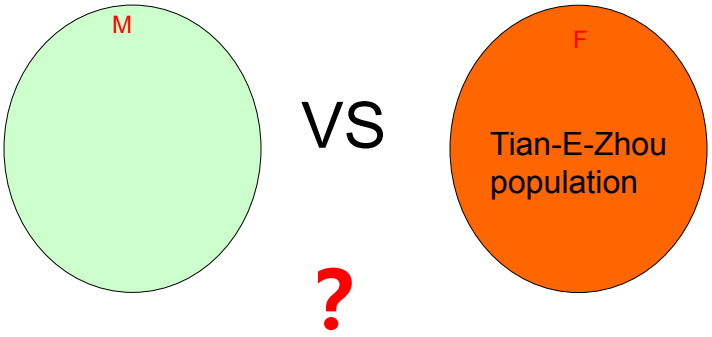
Q3: Why so quickly?



- **Body conditions (H) are significantly different.**
  - ✓H = Weight (kg)/Body length (m)
- Fish resource.

Q3: Why so quickly?

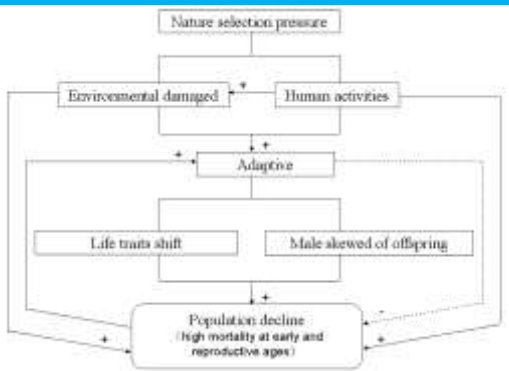


Figure. The hypothesis of the mechanism on the quick decline of YFP population. Where + means positive effect, - means negative effect; the hard line means the solid effect or we can call this long term effect, and the dashed line means the potential effect or short time effect.

Implications for the conservation

- Critically endangered on the IUCN red list.
- Accelerated population decline.
- Human activities affect the porpoise, and the *ex-situ* reserve is an effective management.
- The porpoise join the reproduction earlier and tend to give birth to more male babies which will cause further population decline.
- Shortage of fish resource has a strong responsibility to the male sex skew in babies.

Acknowledgement

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世界首例人工繁养长江江豚成功整整十周年
及第二头江豚满月纪念
Thanks for your listening !
2007年7月5日