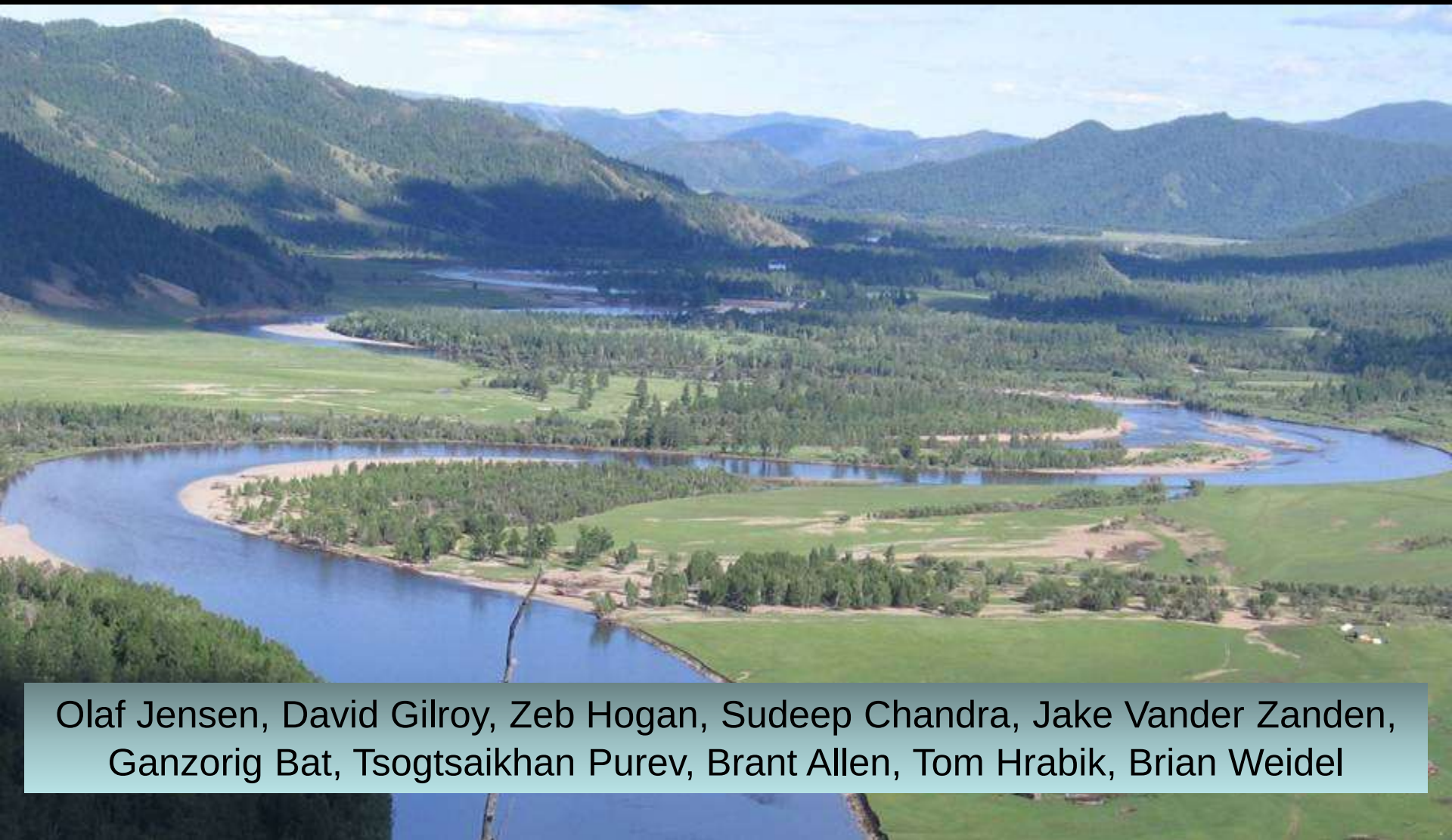
Ecology & Conservation of Taimen, *Hucho taimen*, in Northern Mongolia



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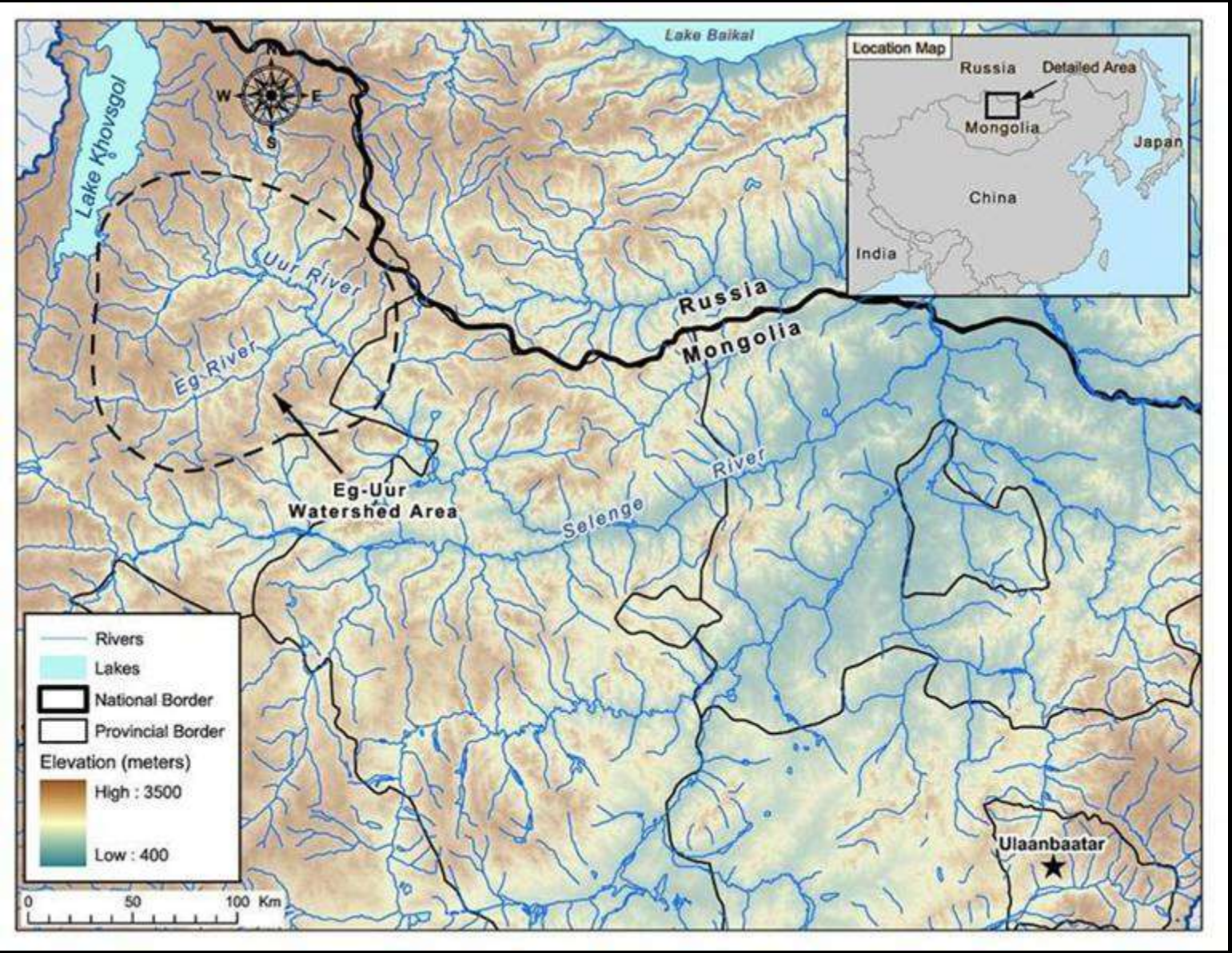
Hucho taimen: The River Wolf

Outline

- Background
- Population Dynamics
- Movement / telemetry

Project location: Eg-Uur watershed, Mongolia



Taimen Conservation Fund

Aquatic ecology and fisheries research

Recreational fishing as ecotourism

Buddhism and conservation

Conservation law enforcement

Objectives

1. Determine whether existing recreational (catch-release) fishing is compatible with conservation of taimen.

2. Evaluate taimen movements with respect to the design of “concession areas”

Data

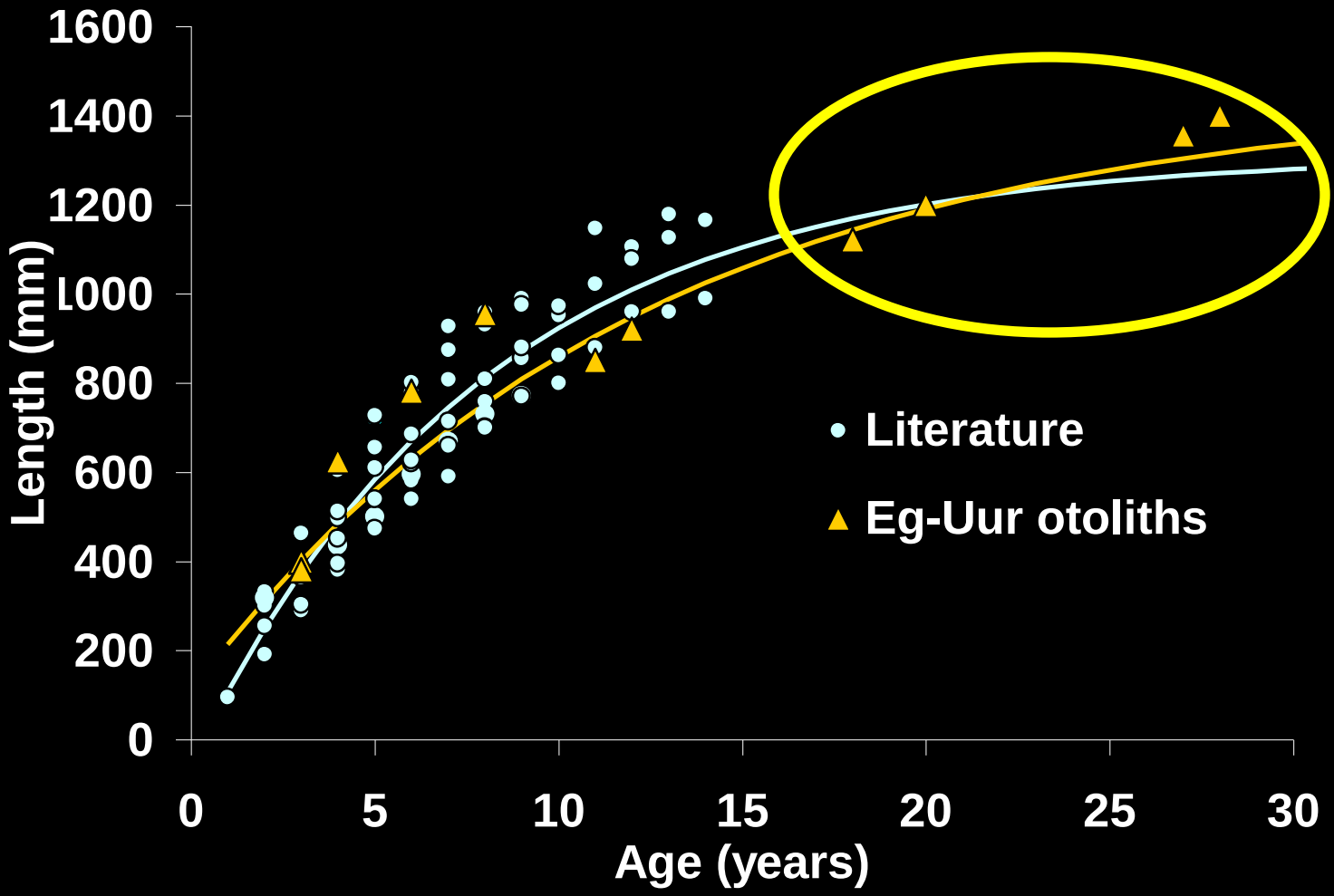
- Age-length info from 11 taimen otoliths
- Growth from published literature
- 4 year mark-recapture study
- Life history invariants and meta-analysis
- Movement and release mortality from telemetry

Data

- Age-length info from 11 taimen otoliths

Data

- Growth from published literature (mostly Russian)

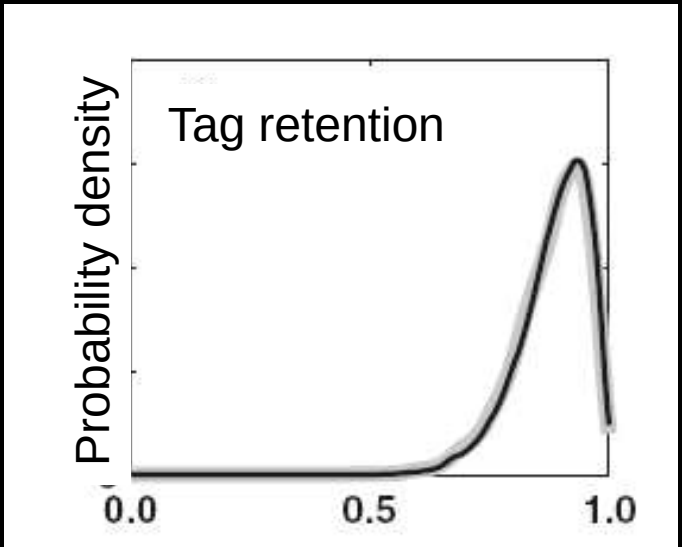


Bayesian mark-recapture model

$$Recaptures_{i,j} = Marks_j \cdot Survival^{(i-j)} \cdot Retention \cdot (Catch/N)$$

Prior on tag retention and survival

- Double marking experiment – Retention (beta(16,2))
- Pauly method (life history invariants) – Survival



Post-release mortality

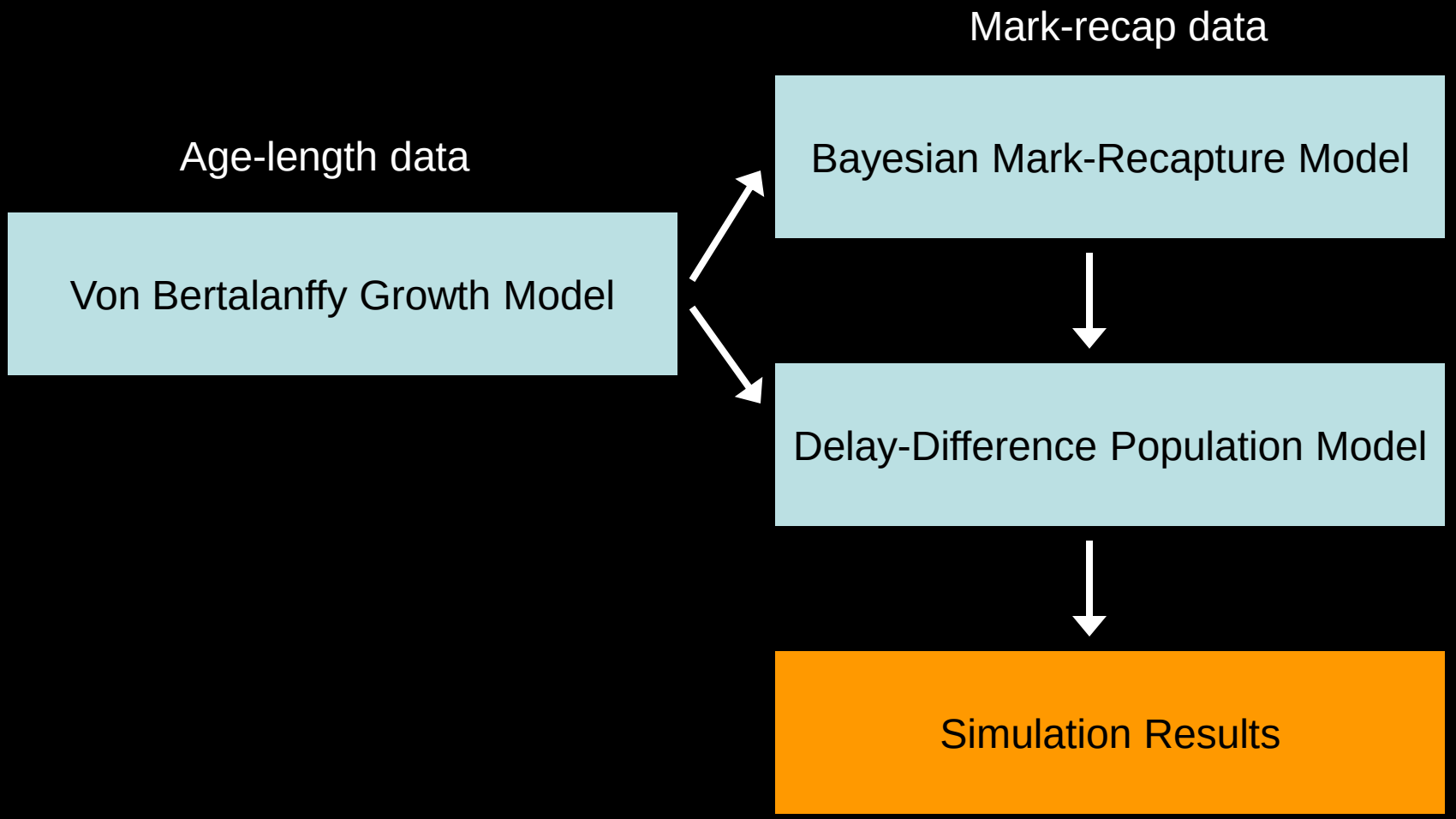
- Upper bound estimated from telemetry tags (mortality = lost contact within first month)

9%

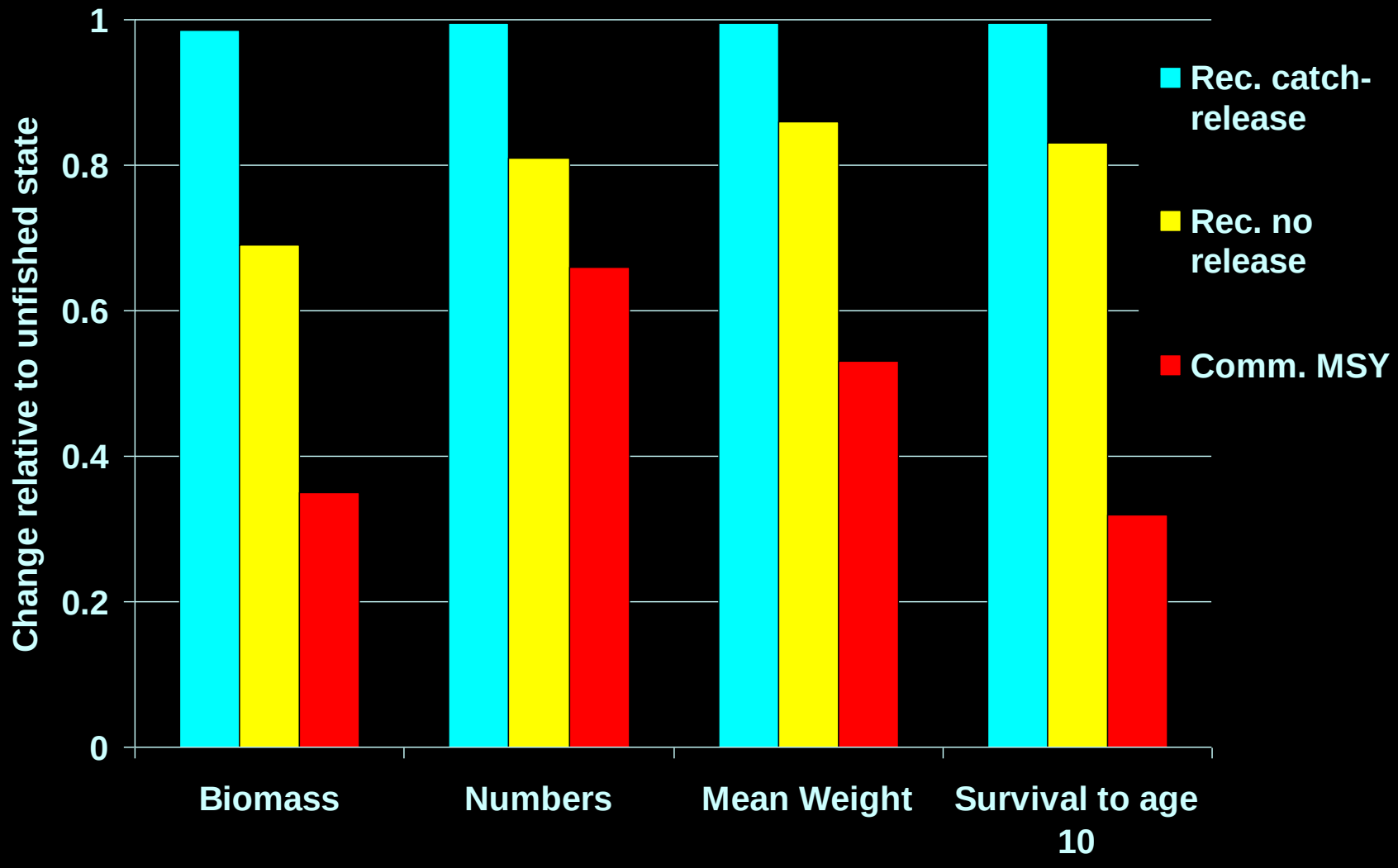
- Lower bound estimated from the fraction of fish with fatal injuries (mortality = bleeding from gills)

4%

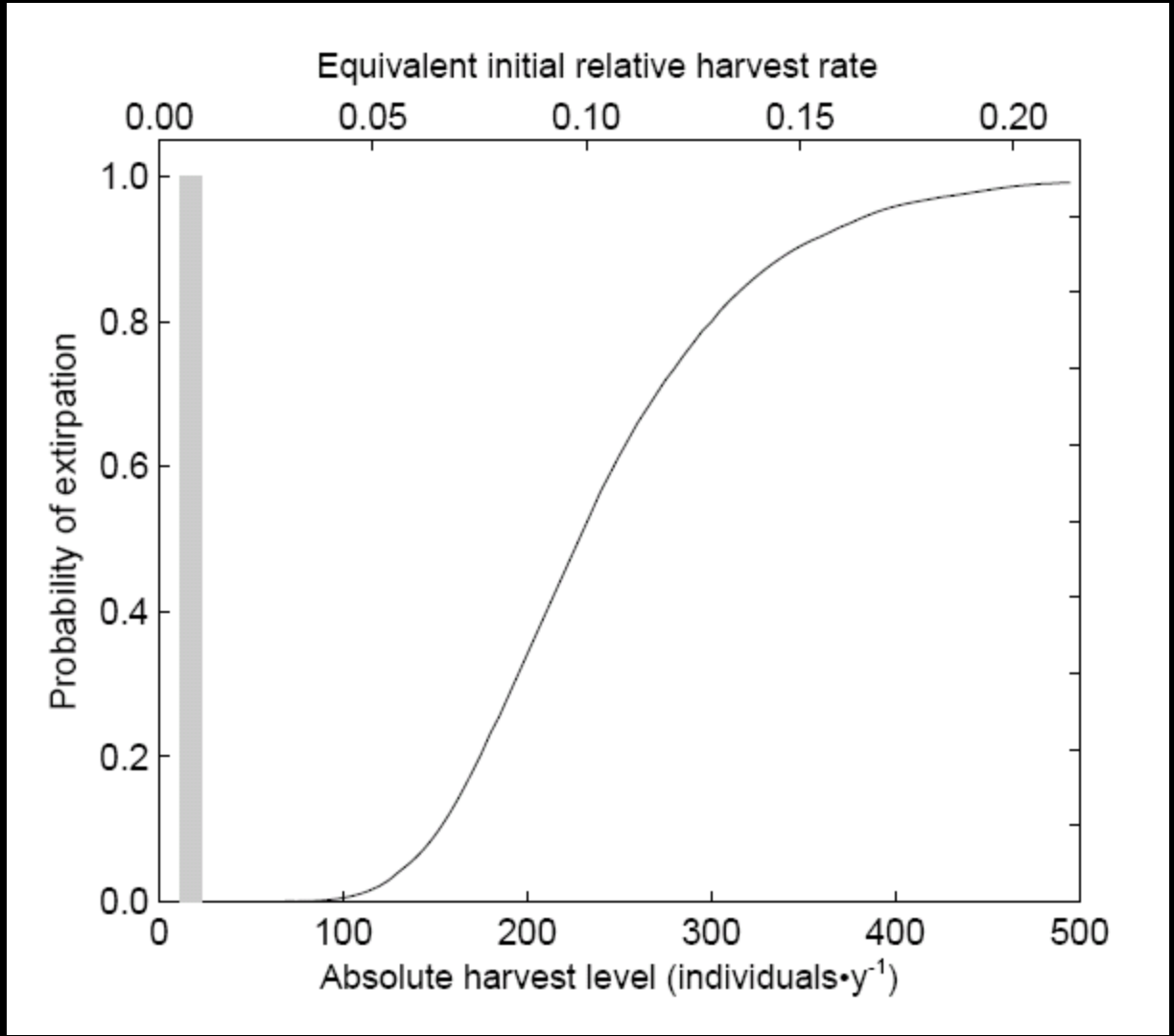
Integrated modeling approach



Results

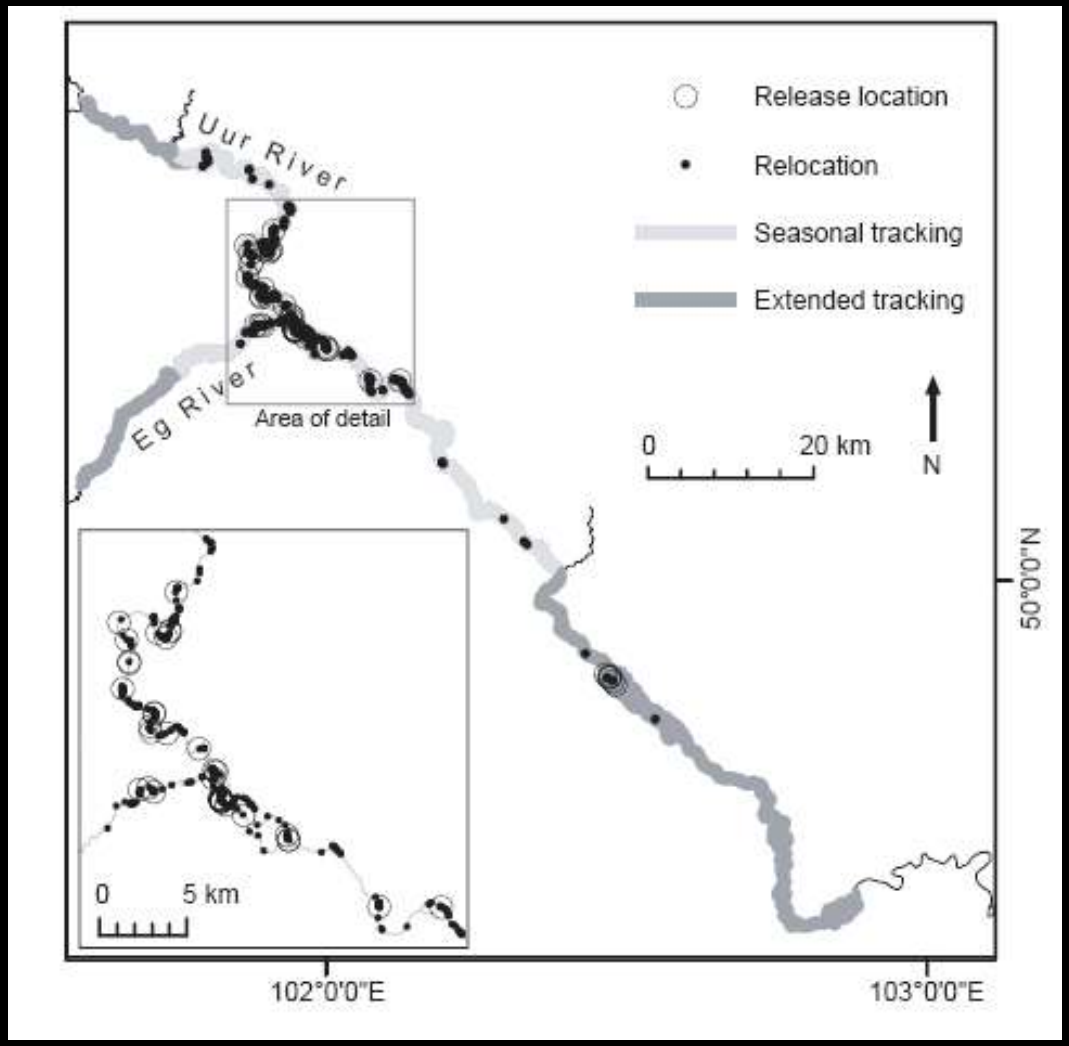

Change relative to unfished state
1
0.8
0.6
0.4
0.2
0
Biomass
Numbers
Mean Weight
Survival to age 10
Rec. catch-release
Rec. no release
Comm. MSY

Results – Probability of extirpation



Jensen et al. 2009

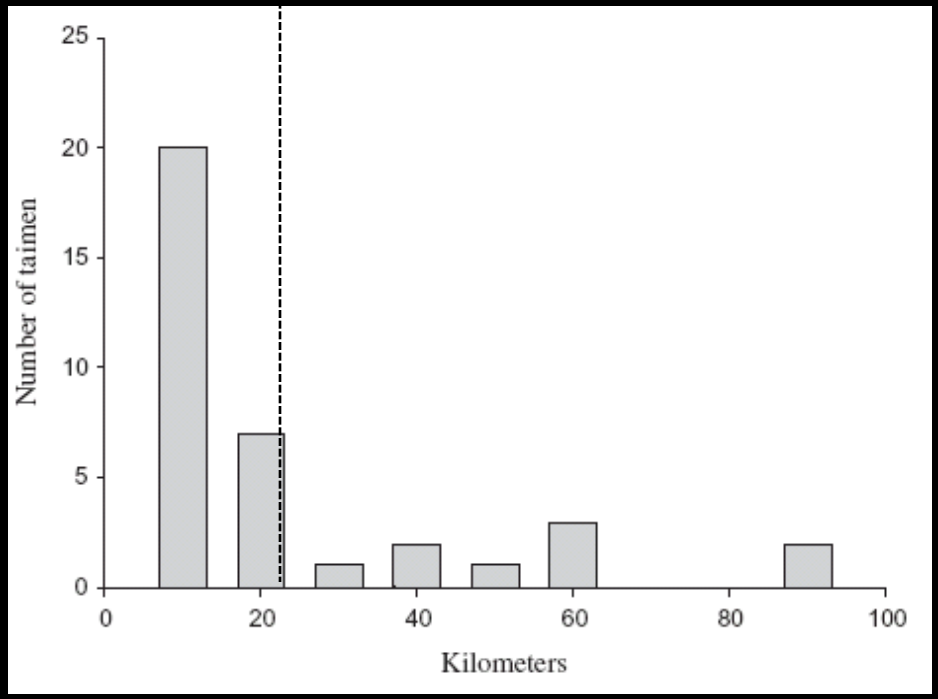
Movements: methods



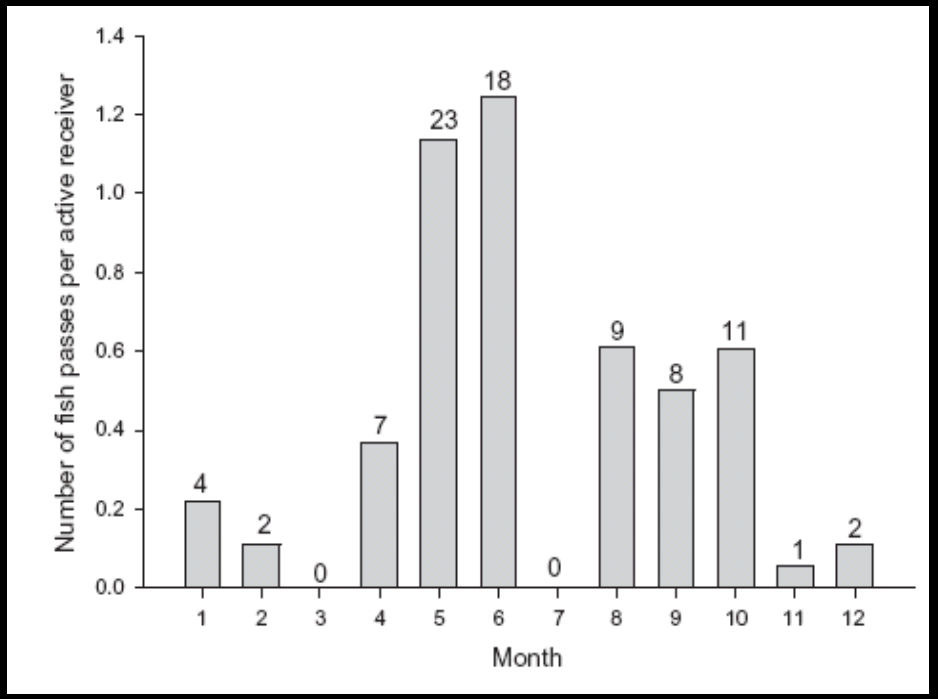
46 tagged taimen
> 4 years tracking

Movements: results

Home range size

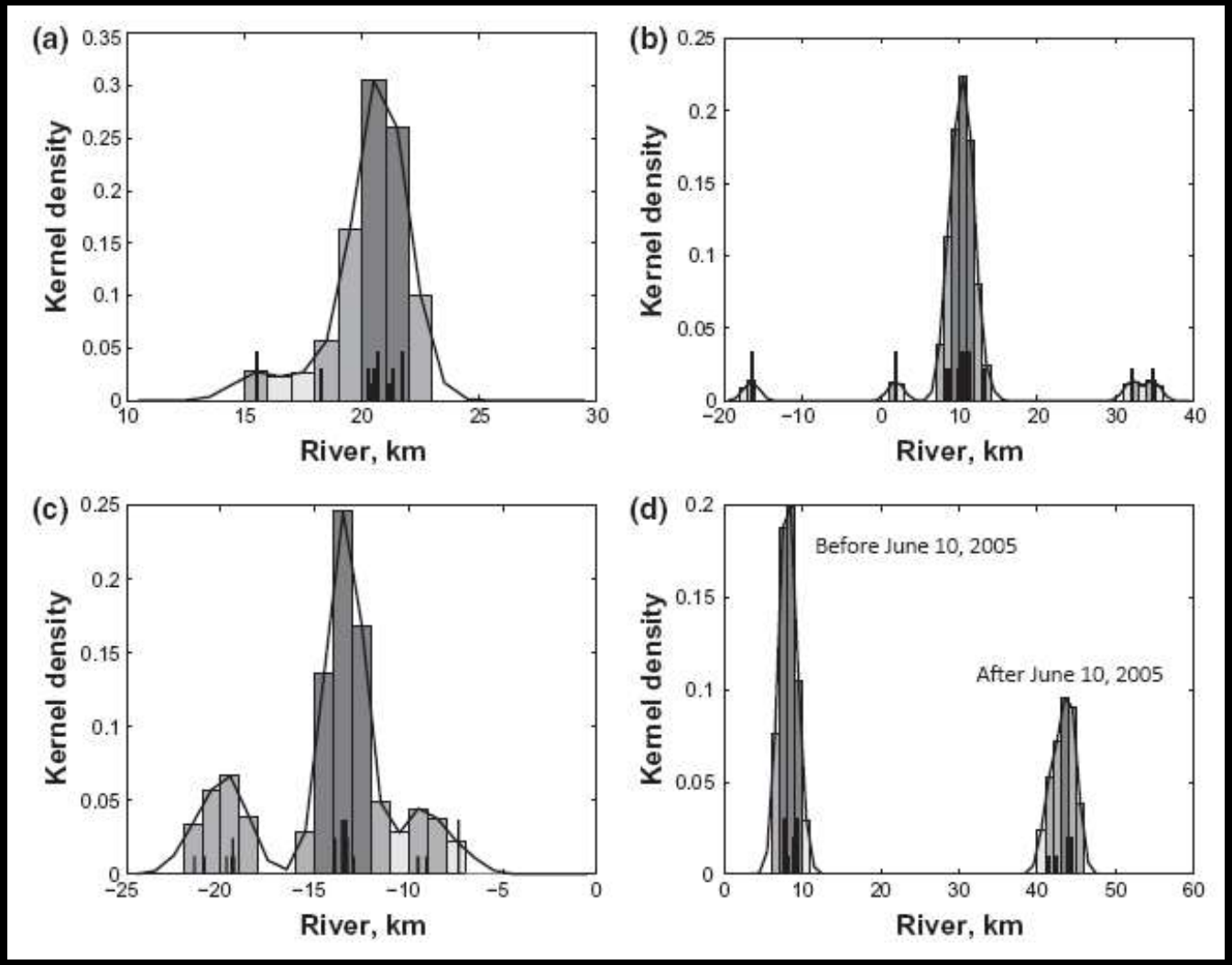


Seasonal movements



Gilroy et al. 2010

Movements: individual variation



Gilroy et al. 2010

Conclusions

- The 100% catch-release recreational fishery has little impact on the taimen population, but recreational harvest could impact survival, abundance, and size structure.
- A commercial fishery operated at MSY would not be compatible with a high-end recreational fishery in the same area and would generate considerably less revenue ($10 – 20 K vs. $300 – 500 K per year).
- Movement rates suggest that spatial management should occur at larger scales (> 20 – 40 km segments)

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