Challenges in following euthanasia guidelines in marine fisheries sampling

Jeffrey A. Buckel

Department of Applied Ecology, Center for Marine Sciences and Technology, North Carolina State University, Morehead City, NC

Outline

- Why do we sample wild fish?
- Review of euthanasia guidelines for fish
- Overview of gear types used in marine fishery sampling and challenges to meet guidelines
- Language in AVMA guidelines related to “commercial fishing gear”

Why do we sample wild fish?

- Estimate trends in *abundance*

- Obtain individual specimens across a range of sizes to track *life history attributes*:

  -reproduction

  -size and age distributions

  -condition

- *Life history attributes* and *abundance indices* used to determine stock status and future sustainable fishing levels
  - Tradeoff - killing some fish during sampling to improve or maintain fish stocks

Aim of AVMA euthanasia guidelines

"…to accomplish death for these animals rapidly with the minimum amount of pain and distress practicable."[1]

[1]AVMA Guidelines for the Euthanasia of Animals: 2020 Edition , p,. 82

Acceptable methods for fish

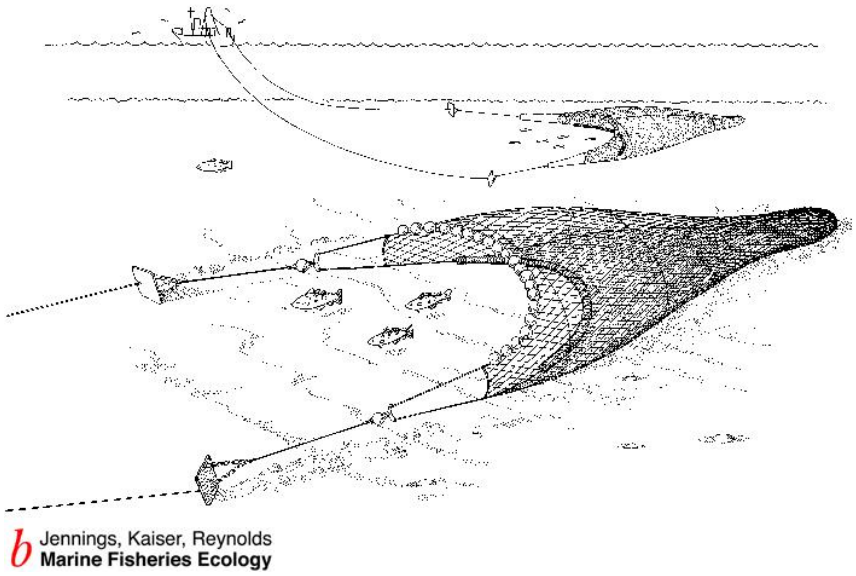
- Non-inhaled methods
  - immersion and injection
- Physical
  - decapitation and pithing

Unacceptable methods

- “… death by anoxia and desiccation after removal from the water or by anoxia in water….”

Gear types used in marine fisheries sampling

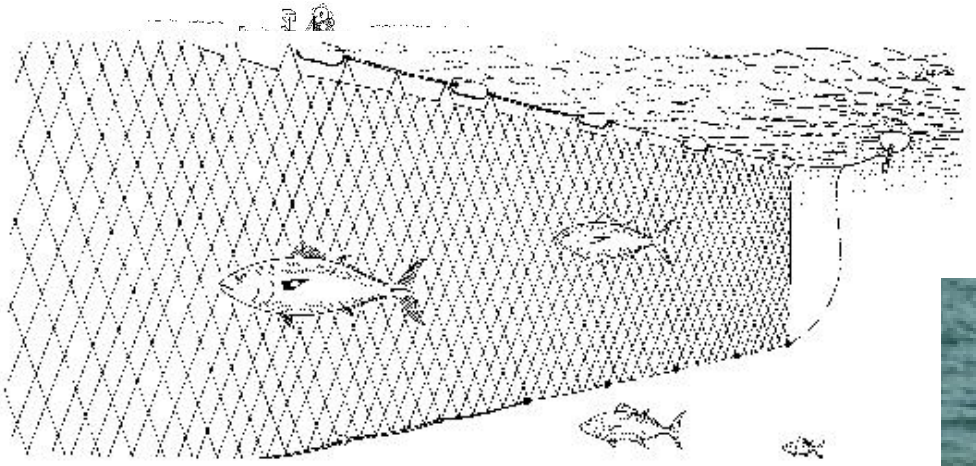
Bottom trawl



b Jennings, Kaiser, Reynolds
Marine Fisheries Ecology

Beach seine

Gill net



Jennings, Kaiser, Reynolds
Marine Fisheries Ecology

Unacceptable methods

- “… death by anoxia and desiccation after removal from the water or by anoxia in water….”

Context matters

S6.2.6.4 Fish kept outdoors and in fisheries[1]

"Field research on fish takes place in a complex environment that must be understood by both researchers and their respective IACUC.

Field research is frequently conducted on a scale comparable to commercial fishing, often with the same equipment, boats, and personnel.

The large number of fish, limited boat space, adverse environmental conditions, and personnel safety concerns may justify use of harvest techniques *that may not meet the criteria for euthanasia*, but in all situations, pain and distress should be minimized to the greatest extent possible."

[1]AVMA Guidelines for the Euthanasia of Animals: 2020 Edition, p. 88

Conclusions

- Marine fisheries sampling often results in large catches
  - not possible to use euthanasia protocols that are applicable to small samples or in a laboratory setting
- AVMA recognizes this and provides language that IACUC committees should be aware of when evaluating protocols
- The language acknowledges the “pragmatic realities”* that researchers might encounter
- Fisheries scientists should clearly justify use of these “high catch” gear types and continue to explore utility of less invasive gear

* Terminology from David S. Miller's abstract