Seabird Bycatch Mitigation Experiments and Regulatory Updates in the Hawaii Longline Fishery

IATTC Working Group on Ecosystems and Bycatch
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Asuka Ishizaki, Western Pacific Regional Fishery Management Council
Hawaii Longline Fishery

Bigeye tuna-targeting deep-set (DSLL)
Swordfish-targeting shallow-set (SSLL)
Higher Albatross Interactions
Higher albatross interactions in the DSLL fishery observed.

2015
Council First Workshop
Workshop to improve understanding of factors underlying increased interactions.

2017
2018
2019
2020
2021
2022-2023

Council Second Workshop
Review seabird measures. Tori line identified as high priority research for DSLL. Blue-dyed bait candidate for removal.

Trial 1 Results
& Council Direction on Regulatory Amendment
Council recommends initiation of regulatory amendment development.

Tori line roll-out & Rulemaking

Trial 2
& Council Action
Second trial to test tori line efficacy compared to blue-dyed bait under region’s first EFP. Council takes final action in Dec.
Seabird Regulatory Requirements for US Hawaii DSLL Fishery (through 2023)

**DSLL:** select from side-setting or stern-setting set of measures when fishing north of 23° N

<table>
<thead>
<tr>
<th>When side-setting, also use:</th>
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<tbody>
<tr>
<td>Bird curtain</td>
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<td>+ Line shooter</td>
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- First implemented in 2001; modified in 2006
- Fishermen also required to handle live seabirds to maximizes survival & owners/operators required to attend annual workshop
- Reduced seabird bycatch by 70-90%
- ~82% of DSLL vessels used stern-setting & blue-dyed bait option
Interactions gradually increased through 2014, and higher BFAL interactions in DSLL starting in 2015

2017: Council workshop to improve understanding of factors underlying increased interactions

2018: Council workshop to review existing Hawaii longline seabird measures and prioritize other measures warranting testing
→ High priority = TORI LINES
→ Candidate for removal = Blue-dyed bait
→ Night setting not suitable for DSLL
→ Side-setting still effective for DSLL
Hawaii Deep-set Longline Tori Line Project
2019-2021

Collaboration between industry, Council, NMFS and researchers:
Eric Gilman, Milani Chaloupka, Holly Naholowaa, Asuka Ishizaki, Eric Kingma, Colby Brady, Matthew Carnes, Sarah Ellgen, John Wang, Yonat Swimmer
Hawaii Deep-set Longline Tori Line Project

- Tori lines previously tested in Hawaii longline fishery (McNamara et al. 1999, Boggs 2001) but not adopted due to entanglement and safety concerns
- Design and test tori line suitable for use in Hawaii deep-set longline fishery
- Input from Hawaii longline fishermen throughout project
- Trials conducted on commercial longline vessels
Designing a tori line for the Hawaii deep-set longline fishery

- Relatively small vessels (<101ft/30.8m)
- No deep-diving birds
  - Primarily Laysan and black-footed albatrosses
  - Dive depth < 2m
  - ~40m aerial coverage needed
- Focus on minimizing tangles
- Light weight & streamlined
- Materials available from local vendors
- Input from Hawaii longline fishermen
- Input from NZ and Japanese tori line experts working with small vessels
Building & testing components

Detailed process described in Gilman et al. 2021 (WCPFC-SC18-EB-IP-14)
Three Design Options: Streamerless, Short Streamers, Hybrid Streamers
Tori Line Design

• Short streamer design selected for trials
• 50m aerial section (dyneema with short streamers spaced 1 m apart)
• 55m drag section (6mm braided rope only)
• Attached at 5m height
• Participating fishermen found design easy to use, safe, and durable
• Consistent with IATTC-C-11-02 & WCPFC-CMM 2018-03 short streamer specifications
Field Trials in the Hawaii DSLL Fishery

Trial 1 (Feb-July 2020)
- Used tori lines in conjunction with existing required seabird measures (blue-dyed bait, weights, line shooter, and strategic offal discharge when N of 23N)
- Alternating sets with/without tori line
- Data collected through stern-mounted EM camera
- 4 vessels, 16 trips, 189 sets
- Details in: WCPFC-SC18-EB-IP-21

Trial 2 (Feb-June 2021)
- Test efficacy of tori lines compared to blue-dyed bait
- Alternating sets using tori lines or blue-dyed bait
- All sets using weights and line shooter
- No strategic offal discharge (eliminate confounding factor)
- Data collected through stern-mounted EM camera
- 3 vessels, 7 trips, 87 sets
- Details in: WCPFC-SC18-EB-IP-15
Trial Results

- Albatrosses 4x less likely to make contact with baited hooks, 14x less likely to get caught when tori lines used instead of blue-dyed bait (small sample size for captures)
- >99% of interactions <50m astern
- Trials did not test efficacy of blue-dyed bait compared to regular bait

Trial 1 results: see WCPFC-SC18-EB-IP-21
Trial 2 results: see WCPFC-SC18-EB-IP-15
New Regulatory Requirements for Hawaii DSLL (April 1, 2024)

- Tori line specifications included in regulations
- Tori line & pole free distribution with bilingual outreach in advance of rule change
- No change to side-setting option
- Best practices for offal management included in annual protected species workshop in lieu of regulatory requirement

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<th><em>NEW</em> Requirements</th>
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For detailed analysis on the regulatory change, see Regulatory Amendment and Environmental Assessment for the Modification of Seabird Interaction Mitigation Measures in the Hawaii Deep-set Longline Fishery
Specifications for the Tori Line Requirement in the Hawaii Deep-set Longline Fishery

- Tori lines are required for Hawaii deep-set longline vessels that set fishing gear from the stern above 23° N. Tori lines must be used in conjunction with weighted branchlines (>45 g weight within 1 m of each hook) and line shooters.
- One tori line must be deployed every set before the first hook is set.
- Two tori lines must be on board the vessel at the start of every trip.
- Mono-nitrate nylon is prohibited for use in the aerial and drag sections of the tori line. See the regulatory language for material specifications.
- If the tori line attachment point is greater than 2 m from the stern, the height would need to be increased by 1/2 m for every 5 m from the stern.

**Tori line attachment point**
(must be 5 m above water if within 2 m from the stern*)

**Tori pole**
(used for support)

**Aerial section**
(must be at least 50 m long, made of ultra-high molecular weight polyethylene, or other NMFS-approved material)

**Drag section**
(6 mm or larger braided material that floats in water)

**Streamers**
(must be at least 30 cm long and must be spaced at least every 1 m along the aerial section)

Streamers are not required for the last 20 m of the aerial section.

Aerial and drag section combined must be at least 100 m long.
Seabird Mitigation Measures for the US Hawaii SSLL Fishery

Operational differences in DSLL vs SSLL that affect seabird mitigation measure effectiveness and practicality

- **Effort distribution**: SSLL fishery operates further north than DSLL → rougher conditions; different seabird overlap (but same two species)
- **Night vs day**: SSLL is a primarily a night-setting fishery, DSLL is a day-setting fishery
- **Haul speed**: SSLL hauls gear at faster speed than DSLL → greater safety concerns with branchline weighting
- **Gear sink rate**: SSLL gear sinks at slower speed → greater aerial coverage needed for tori lines

### SSLL Regulatory Requirements
 ap(plies everywhere; most effort north of 23°N)

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Hawaii Shallow-set Longline Tori Line Project (ongoing)

- Pilot Study
  - Improve seabird mitigation measures in the SSLL fishery while improving practicality and promote operational efficiency
  - Preliminary testing of tori lines in the SSLL fishery as an alternative to blue-dyed bait
  - Explore alternative combinations of seabird mitigation techniques to allow flexibility in start of set time (historically adjusted set time according to lunar phase to optimize catch)

- Study Design
  - 1 vessel, minimum target 40 sets (20 paired sets)
  - Alternate control and experimental sets
    - Control: blue-dyed bait & night set
    - Experimental: double tori lines & start set 1 hr before local sunset
  - No strategic offal discard during setting
  - EM stern camera & observer data collection

- Field trials recently completed & analysis underway
References


MAHALO!

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