

Aerial Surveys for Leatherback Sea Turtles Off of NE North Island, NZ

CSP Project #: POP2023-01
Technical Working Group
June 25, 2024

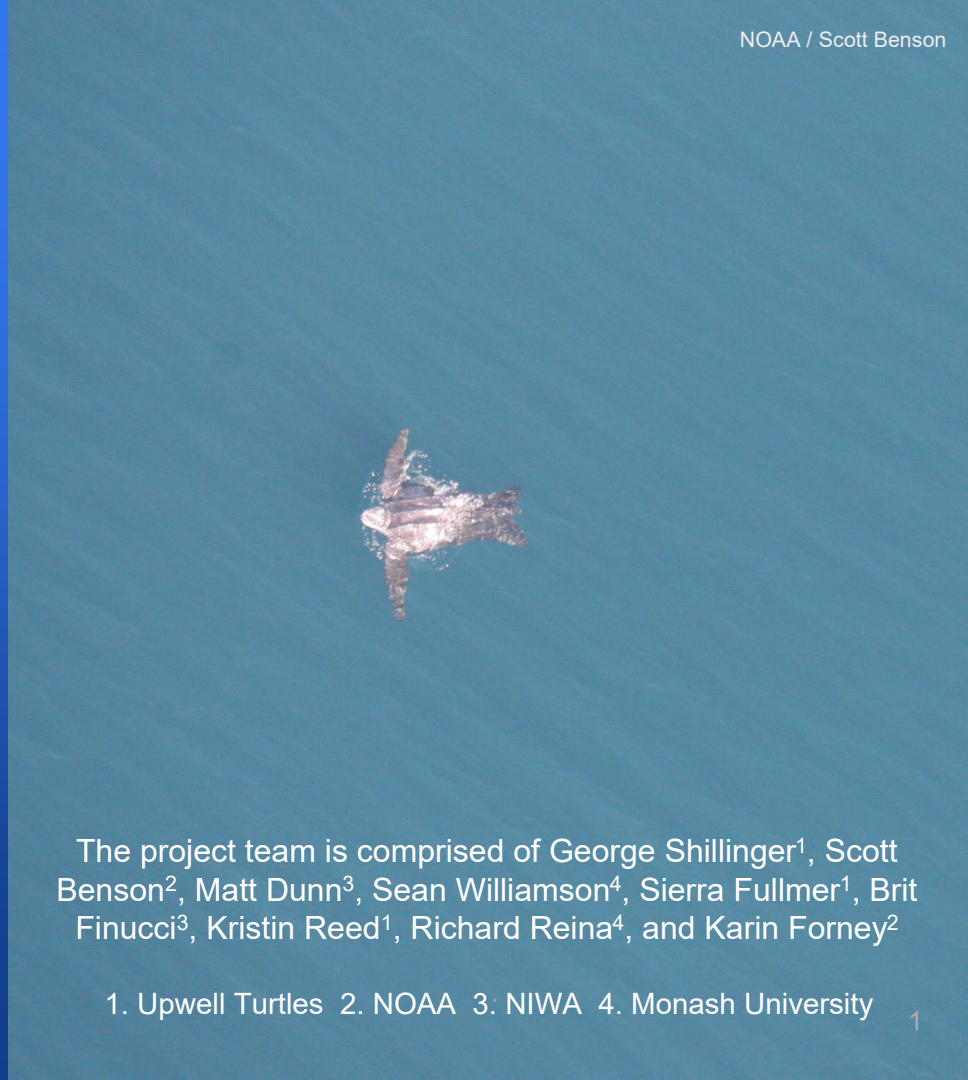


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University



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1. Upwell Turtles 2. NOAA 3: NIWA 4. Monash University

Agenda

- Leatherback Biology
- Project Background: Leatherback Bycatch Off of NE North Island, NZ
- Project Background: Upwell and NOAA Surveys on the US West Coast
- Project Objectives and Outcomes
- Project Timeline
- Scoping Trip
- Proposed Survey Design
- Next Steps



Leatherback Sea Turtle Biology



- Obligate “jellivores”
- Remigrate every 2-7 yrs
- Weigh up to 900 kg
- Adults can be 1.20 - 2.40 m long
- Unique physiology for thermoregulation
- Widest ranging sea turtle
- Deepest divers (~1250 m)
- West Pacific leatherbacks are Critically Endangered
- West Pacific population has declined by 80% in last 30 years, continues at a rate of 6% per year
- Threats at sea include: fisheries bycatch, vessel strike, plastic pollution, climate change, and shark mesh nets



West Pacific Leatherbacks

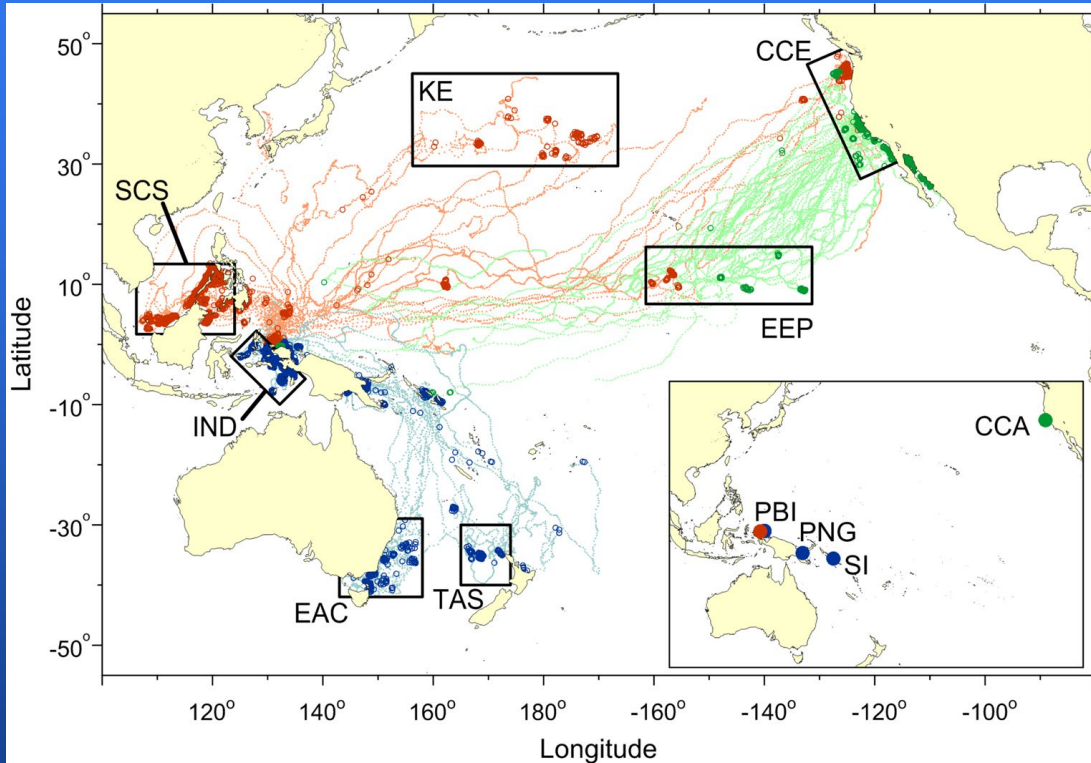


Figure 1. All 126 deployments presented as probability of transit. Large, darker circles indicate Area Restricted Search (ARS) behavior; small, lighter dots indicate transiting behavior. (Benson et al. 2011)

Color indicates deployment season:

- Red** = Boreal summer nesters (July peak)
- Blue** = Boreal winter nesters (January peak)
- Green** = Deployments at central California foraging grounds

Inset shows deployment locations:

- PBI = Papua Barat, Indonesia
- PNG = Papua New Guinea
- SI = Solomon Islands
- CCA = central California

Black boxes represent ecoregions

- for which habitat associations were quantitatively examined:
- SCS = South China, Sulu and Sulawesi Seas
 - IND = Indonesian Seas
 - EAC = East Australia Current Extension
 - TAS = Tasman Front
 - KE = Kuroshio Extension
 - EEP = equatorial eastern Pacific
 - CCE = California Current Ecosystem

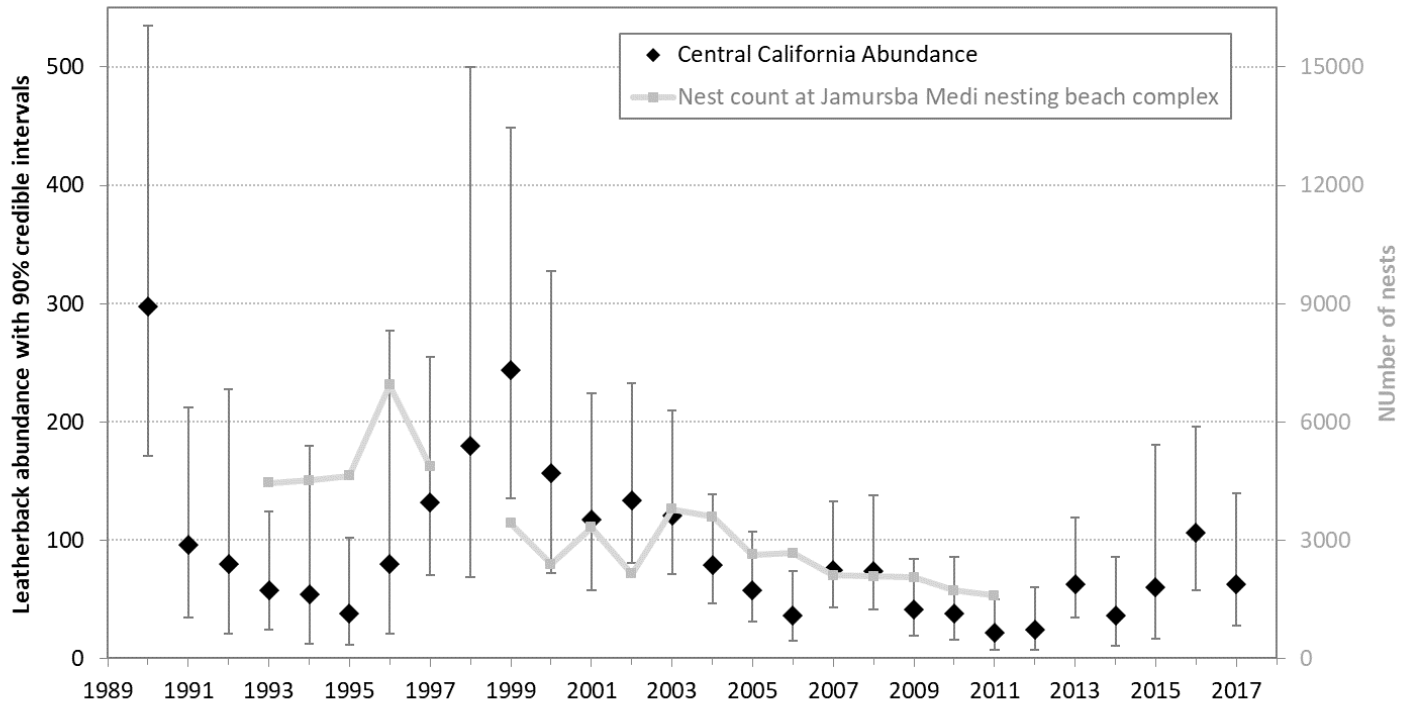


Figure 2. Estimated leatherback abundance off central California, 1990-2017 (black diamonds, with 90% credible intervals; see Supplemental Table S2), and summer nest counts at the largest remaining Western Pacific nesting beach complex (Jamursba Medi, Birds Head Peninsula, Indonesia; from Tapilatu et al. 2013) for comparison. (Benson et al. 2020)

Project Background

Leatherback Bycatch Off of NE North Island, NZ

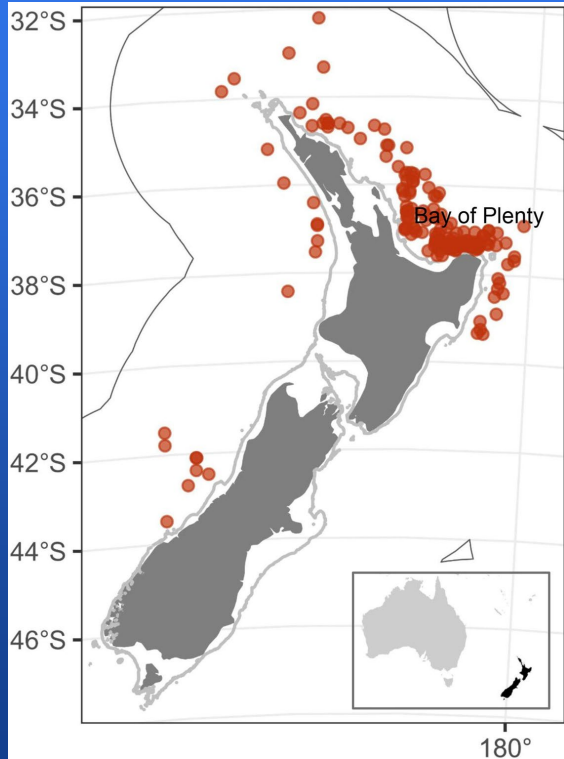


Figure 3 Distribution of fisher-reported and observer-reported leatherback turtle captures from 2007–08 to 2020–21 (red dots, $n=217$). Grey line indicates the 100 m isobath, and the black line is the New Zealand Exclusive Economic Zone (EEZ). (Dunn et al. 2023)



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Project Background:

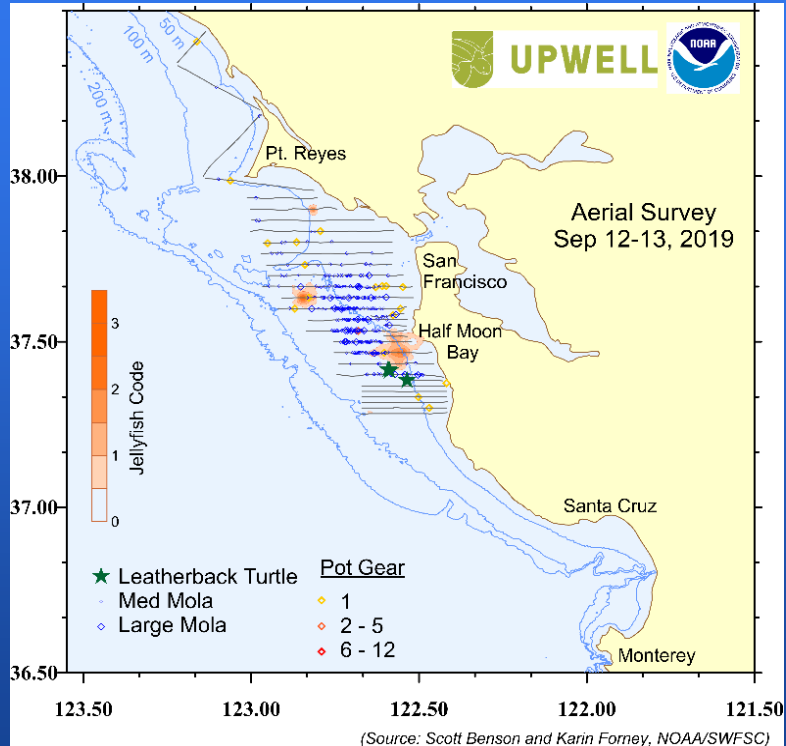
NOAA and Upwell

Aerial Surveys and Vessel-Based Tagging

Goal: To provide best-available scientific data on West Pacific leatherback abundance, distribution, movements and behaviors in US West Coast waters to inform fisheries management.



Near Real-Time Data

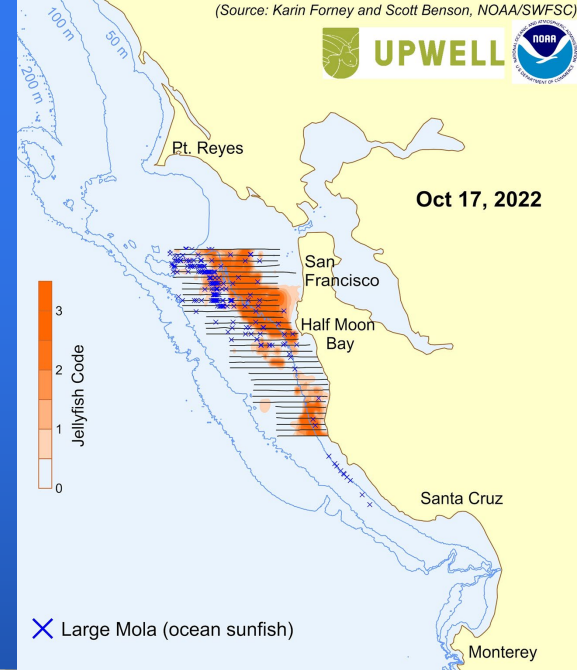


Project Objectives and Outcomes

Project (POP2023-01) will provide the first fishery independent data on the distribution and abundance of leatherback sea turtles off the Northeast North Island:

- Design and trial an aerial survey for leatherback sea turtles and associated marine megafauna in an eastern Bay of Plenty hotspot during a temporal window of elevated leatherback observed presence and fisheries overlap
- Provide fishery independent information on the abundance of leatherbacks inside and outside the bycatch hotspot as well as other marine megafauna and ecological indicator species observed during flights
- Provide information on the distribution of leatherbacks in relation to environmental variables known to influence their distribution

EXAMPLE SURVEY



Project Timeline

2024

- Scoping trip (completed in May)
- Submit technical report detailing finalised aerial survey methodology incorporating feedback from the Conservation Services Programme Technical Working Group
- Begin recruiting and training a team of aerial observers
- Initiate collaboration with local Maori Communities

2025

- Completion of aerial observer training
- Aerial surveys will be conducted during peak leatherback entanglement times
- Analysis of survey data

2026

- Presentation of results at the project's conclusion project (June)



Scoping Trip



Proposed Survey Design

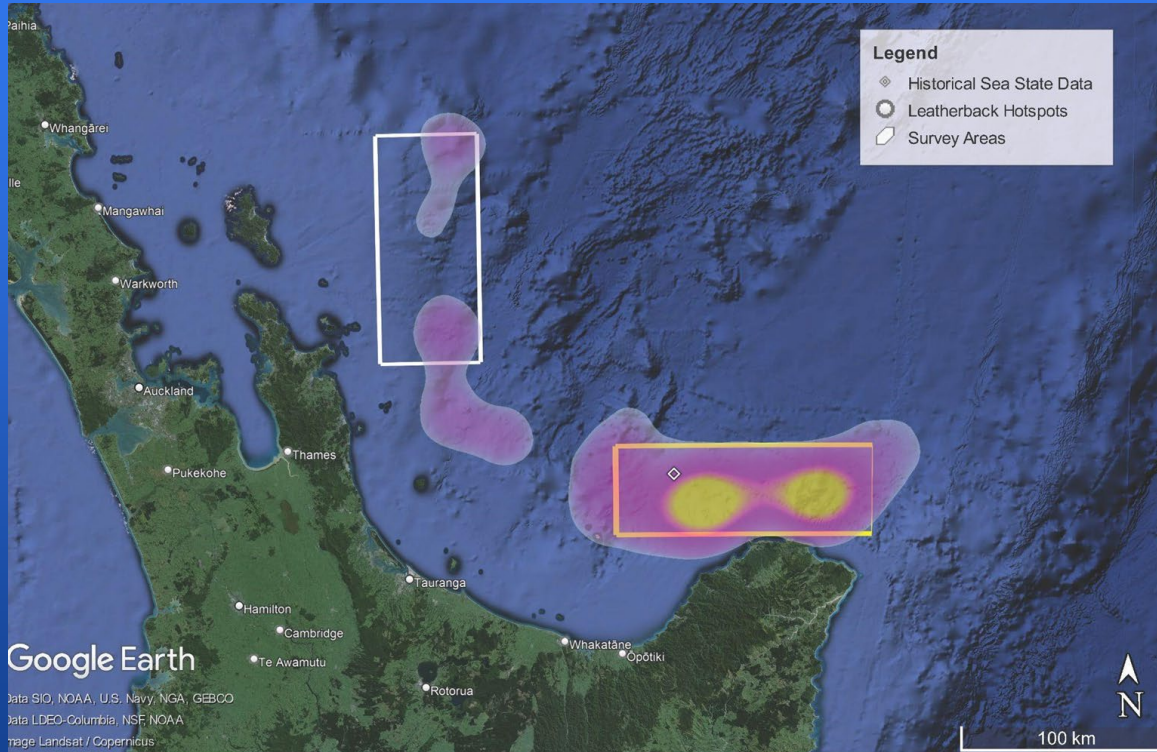
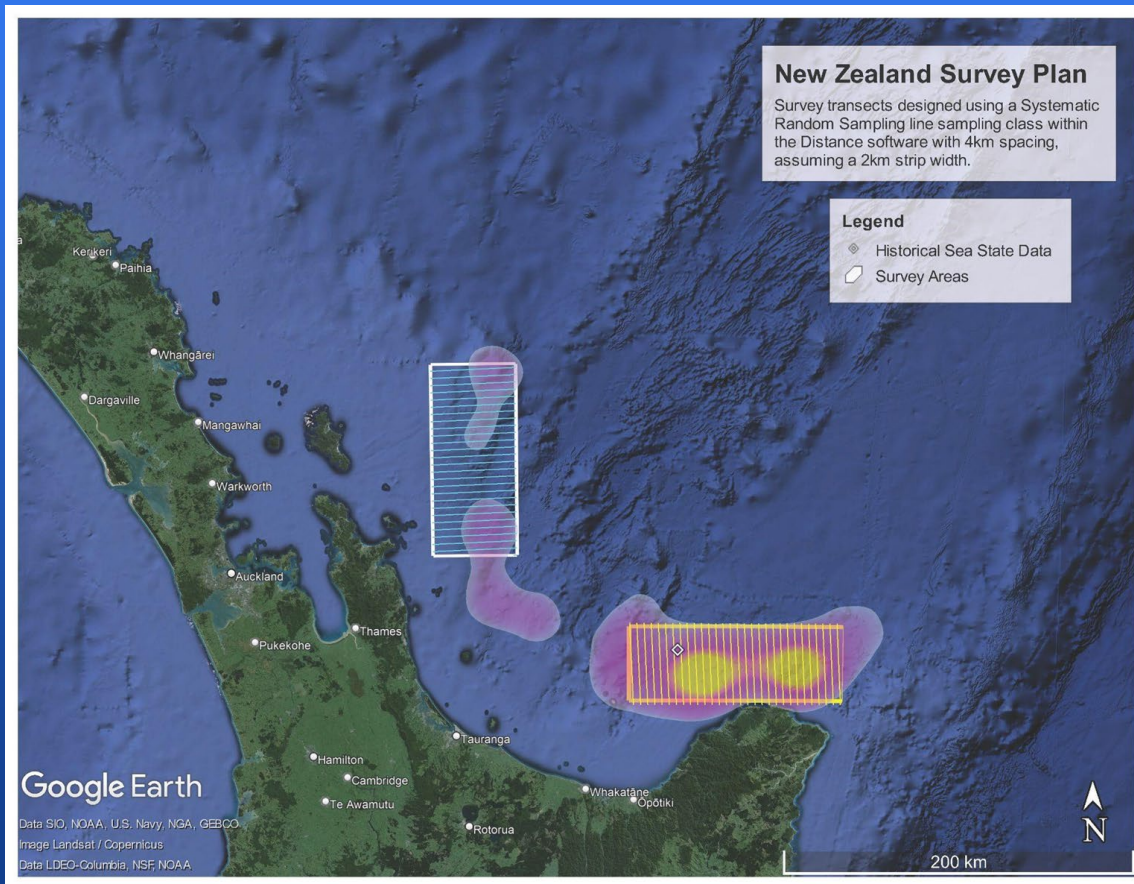


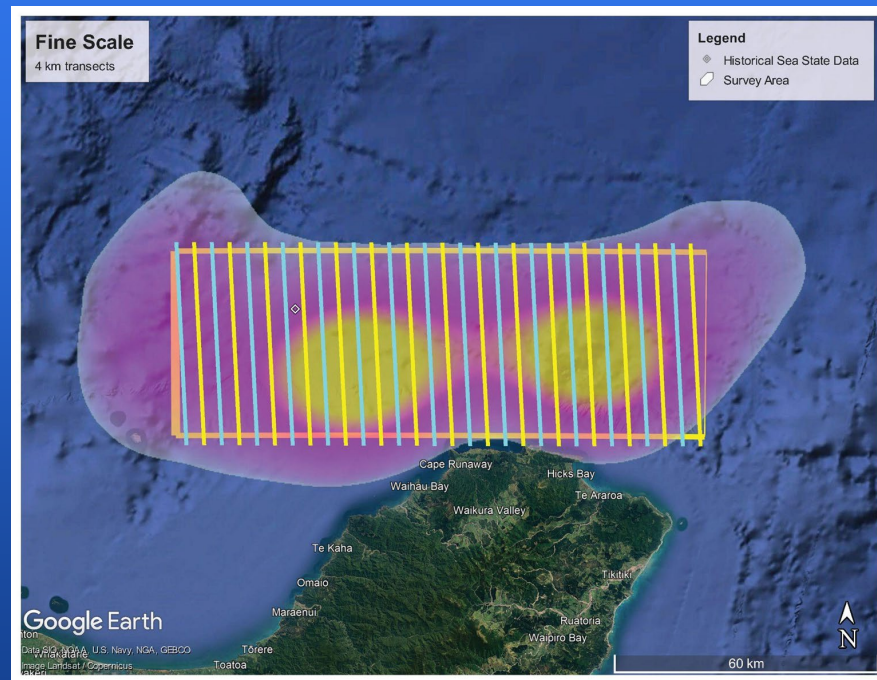
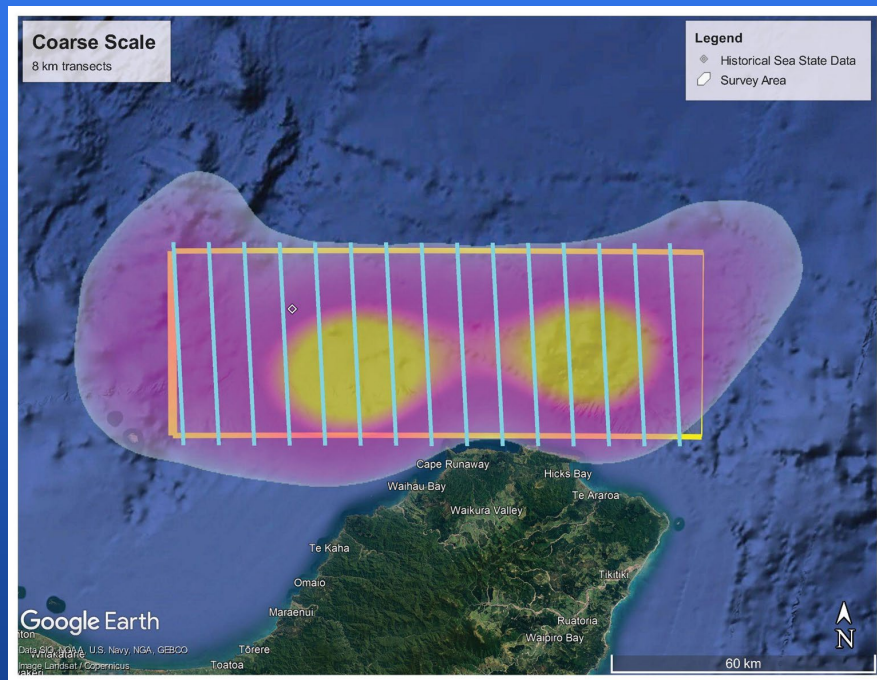
Figure 4. Proposed survey areas within Bay of Plenty. Heatmap shows areas of high historical leatherback sightings, yellow box is proposed “Hotspot” Area and white is the proposed control area. White diamond shows location of historic sea state data incorporated into survey design.



Proposed Survey Design



Proposed Survey Design



Next Steps

Deliverable/Milestone	Performance Standards	Due date
2024		
Survey design presentation	Presentation detailing proposed survey design to Conservation Services Programme Technical Working Group.	To DOC: Jun 7, 2024
Final survey design technical report	Technical report detailing finalised aerial survey and survey methodology.	Jun 30, 2024
Pre-survey progress report	Progress report indicating readiness for and timing of aerial survey.	Oct 30, 2024
2025		
Aerial Surveys	Completion of observer training and aerial surveys during peak season	Jan - Mar 2025
Post-survey progress report	Progress report upon completion of aerial survey. Results of aerial survey presented to the CSP Technical Working Group.	May 25, 2025
Progress report	Progress report on data analysis.	Nov 25, 2025
2026		

Next Steps

Deliverable/Milestone	Performance Standards	Due date
2026		
Completion of reporting requirements	<p>Draft report describing the design and results of the aerial survey, an assessment of the power of the survey to detect changes in abundance of leatherback sea turtles, and recommendations for the design of an ongoing aerial survey programme</p> <p>Presentation of findings to the CSP Technical Working Group.</p> <p>Revised final report taking into due consideration any feedback from the Conservation Services Programme Technical Working Group.</p>	Jun 25, 2026

Thank you!

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