Biology of Leatherback Turtles off California: Movements, Foraging Ecology, Abundance, and Status

Presentation to the California Dungeness Crab Fishing Gear Working Group, 23 April 2019
• Largest turtle in the world (up to 7ft and 2000 lbs.)
• Flexible, skin-covered carapace
• Most extensive range of any living reptile
• Cold water tolerant (mesotherm)
• Deepest diving reptile (to ~3000 ft)
• Consume gelatinous prey (jellies, salps, tunicates)
• Nesting confined to tropical beaches
• Forage in temperate and tropical regions
Leatherback turtle life cycle
From tropical nesting beaches to temperate or tropical foraging areas throughout the Pacific (including U.S. West Coast)
Western Pacific leatherback movements & foraging areas

(Benson et al. 2011)
“US West Coast” leatherbacks
Leatherback foraging habitats, behavior, and prey off central California

- Aerial surveys and animal-borne video
- Shelf habitat with abundant sea nettles (*Chrysaora fuscescens*)
- May - November foraging

NOAA – NMFS Permit #1596
Variability of leatherback distribution off central California

Long-term (1990-2016) aerial surveys along central and northern CA coast (see Benson et al. 2007)

Fine-scale surveys off central CA in leatherback foraging 'hotspots' (vary by year)
Leatherback Nesting Trends, 1984-2011
Bird's Head Peninsula, Papua Barat, Indonesia

5.9% annual decline (78% over 27 years) <1500 females remain
Threats to **endangered** leatherback turtles

- Fishery by-catch
- Egg predation
- Egg harvesting
- Beach erosion
Priority Action item #1: Reduce Fishery Interactions

Pelagic longline and gillnet fisheries: swordfish and tunas

Coastal gillnet and fixed gear fisheries
Leatherback entanglements and CA fixed gear fisheries

• Leatherbacks present off CA ~May-November
• Fixed gear entanglements in central CA:
  ➢ Sep 2015: (top photo) dead leatherback in unidentified fixed gear
  ➢ April 2016: (bottom photo) leatherback released alive from CA Dungeness crab gear by fisherman.
  ➢ Nov 2016 (unconfirmed): one leatherback tagged as part of our studies may have died in Dungeness crab gear off Half Moon
• Turtles are notorious for getting tangled in rope in all oceans, but chance of detecting entanglements is low.
• Given leatherback’s highly endangered status, <1 death per year along U.S. West coast would prevent population recovery (Curtis et al. 2015)
How can we mitigate leatherback entanglement risk in fixed gear fisheries during fall and spring?

- **GOOD NEWS:** We have the research and monitoring capacity
- Our past research has demonstrated that tagging studies and aerial surveys can provide the data we need to understand and mitigate leatherback entanglement risk in nearshore waters (for RAMP?)

**September 2016:** Aerial survey sightings of leatherback turtles

**Sep - Nov 2016:** telemetry locations (5 leatherbacks)

**June 2017:** telemetry locations for 1 returning leatherback
## Seasonal timing...RAMP style

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### Map

- **Start:** 28 Sept. 2018
- **End:** 18 April 2019
- **Location:** Central CA Coast

### Events
- **Hawaii**
- **DCRAB Fishing Season**
- **Commercial Salmon Season?**
- **Humpback Whale Migratory Presence**
- **Gray Whale Migratory Presence**
- **Blue Whale Migratory Presence**
- **Leatherback turtle**
Questions?

Please report turtle sightings to Scott.Benson@noaa.gov or swfsc.turtle-sightings@noaa.gov

THANK YOU!