Marine Turtle Research Program

- Background of NOAA Fisheries Marine Turtle Research Program
- Discuss current research focusing on Pacific Leatherback turtles
<table>
<thead>
<tr>
<th>Species</th>
<th>IUCN Status</th>
<th>ESA Status</th>
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</thead>
<tbody>
<tr>
<td>Leatherback</td>
<td>critically endangered</td>
<td>endangered</td>
</tr>
<tr>
<td>Green turtle</td>
<td>endangered</td>
<td>threatened*</td>
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<tr>
<td>Loggerhead</td>
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<td>threatened</td>
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<tr>
<td>Olive ridley</td>
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<td>threatened</td>
</tr>
<tr>
<td>Hawksbill</td>
<td>critically endangered</td>
<td>endangered</td>
</tr>
</tbody>
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* ESA lists East Pacific Green Turtle as Endangered
Priority Actions

Pacific Marine Turtle Recovery Plan

- Census and protect nesting populations
- Eliminate incidental take in fisheries
- Determine movement patterns, habitat needs, and primary forage areas
- Determine abundance in US waters
- Identify stock ranges
Primary Activities to Address
Recovery Plan Goals

- Study marine turtle life-history parameters
- Establish population genetic structure
- Determine population abundance trends
- Collaborate with international partners to collect nesting beach data and reduce marine turtle bycatch
Know a lot about turtles on nesting beaches
...But very little about turtles in the open ocean
Importance of Leatherbacks to the U.S.

- Listed as Endangered under the ESA
- U.S. waters serve as important foraging habitat for leatherbacks
- U.S. fisheries interact with leatherbacks
- Leatherbacks strand on U.S. beaches
- Decreasing trends at key nesting beaches
Research Tools

- Molecular markers to determine baseline nesting beach stock structure and stock origin of by-catch and stranded animals
- Satellite telemetry to determine migratory routes, habitat use, and diving behavior
- Aerial surveys to determine nesting beach abundance and presence/absence of animals
- Isotope analysis to determine habitat use and foraging ecology
Pacific Leatherback Population Structure

**Western Pacific**: Indonesia, Papua New Guinea, and Solomon Islands

**Eastern Pacific**: Mexico, Costa Rica and Nicaragua

**Sources of information**
- Genetics
- Satellite telemetry
Marine Turtle Program

Nesting Population Assessments

Decline of Pacific Leatherback Turtles

Source: Spotila et al. 2000

Malaysia 1988–94

Mexiquillo, Mexico 1984–95

Source: Sarti et al. 1996

Las Baulas, Costa Rica 1988–98

Source: Spotila et al. 1996

Decline of Pacific Leatherback Turtles

Source: Hittapew et al. 2002

Leatherbacks Nesting Females
Jamursba-Medi Beach Papua

Source: Spotila et al. 1996

Number of leatherbacks nesting

Source: Spotila et al. 2000
Use of Satellite Telemetry to determine migratory routes and diving behavior
Satellite-tracked movements of Leatherbacks in 2000-2004

Dutton et al., unpublished data
Central & Northern California Nearshore Aerial Surveys

- Systematic surveys for harbor porpoise (Forney et al. 1991).
- Coast to 90-m isobath.
- Summer / Fall 1990-2002
- Line-transect analysis performed to estimate leatherback abundance
  ✓ Effort corrected
Leatherback Sightings 1980-2002

Distribution patterns of leatherbacks: Pacific coast - USA

- Central California
- Cape Mendocino
- Adjacent to Columbia River
Significance of Research Findings

- Tens to hundreds of turtles forage off coastal California each summer / fall
- Upwelling shadows and relaxation events appear linked to leatherback turtle occurrence
- Leatherbacks appear to be associated with *Chrysaora fuscescens*, their preferred food source
- U.S. Fisheries interact with leatherbacks from the western Pacific population

Best interest to have healthy populations, but recovery won’t occur just by decreasing mortality in fisheries so...
Focusing on conservation of international nesting beaches and foraging areas
Future Research

- Leatherback distribution and abundance through continued nesting beach surveys and in-water work
- Expand aerial survey efforts to include California, Oregon, and Washington
- Expand aerial surveys of nesting beaches in western Pacific
- More emphasis on seasonality of leatherback occurrence
- Integrate oceanographic features
Modeling may be used to help predict the probability of marine turtle - fisheries interactions by incorporating data on oceanography, gear types, seasonality, and satellite tracks.

Long-term Goal
Thank You...
Estimated females

Data

- 1981 Salm et al.
- 1984-1985 WWF-Bhaskar
- 1993-1996 WWF Bakarbessy
- 1997 WWF-Lamuasa
- 1999 WWF-Teguh
- 2000 KSDA-YAL
- 2001 WWF-Wamafma
- 2002-2003 WWF-Thebu