Birds and Migratory Pathways: An Overview of the Gulf of Mexico

Randy Wilson
U.S. Fish and Wildlife Service
Why is the Gulf of Mexico so important for birds?

“Most roads lead to the Gulf of Mexico”
395+ Bird Species
- 18 Orders
- 53 Families
This estimate only applies to nocturnal migrants with a northward trajectory, thus is a conservative estimate (i.e., does not account for any diurnal migration, nor resident birds).
When is migration? (using citizen science - eBird data)
The answer is both. A few examples include:

**Diurnal Migrants:** Pelicans, Hawks, Falcons, Swifts and Swallows

- Larger birds can take advantage of daytime thermals
- Swifts and Swallows can feed on the wing

**Nocturnal Migrants:** Flycatchers, Warblers, Vireos, Thrushes, Sparrows

- Protection from predators (Hawks and Falcons)
- Less turbulent air
- Cooler air temperatures
- Stars and the moon provide navigational aid
In general terms, birds make either:

- Trans-Gulf Flight – straight across
- Circum-Gulf Flight – hug the coastline
Migratory Pathways

Means of Assessing Bird Movements

- Individual Observations
- Tagging Studies
- Radar Ornithology

During their migration many birds fly more than 1,000 km over open water.
Individual Observations
(GoMMAPPS Data)

Royal Tern (resident)

Band-rumped Storm Petrel (transient)
Individual Tracking (Swallow-tailed Kites)

Fall Migration

Spring Migration

http://www.swallow-tailedkites.org/2020/05/
Individual Tracking (Whimbrel)

The Center for Conservation Biology and Canadian Wildlife Service
Mackenzie River Delta Whimbrel Migrations Fall 2012 and Spring 2013

Whimbrel Migration Routes
- Akipik Route
- Mackenzie Route
- Taglu Route
- Pingo Route

https://ccbbirds.org/2013/07/15/mackenzie-whimbrels-complete-loop-migration/
Individual Tracking

Prothonotary Warbler

Tonra et al. 2019

Purple Martin

Lavallée et al. 2021
Community-level Observations (Radar Ornithology)
Spring Migration (2007-2015)

- Spatial Relevance
- Temporal Relevance

Community-level Observations (Radar Ornithology)

Horton et al. 2019

![Graph showing bird migration patterns over time.](image-url)
Spring Migration (2007-2015)

Spatial Relevance:
• Importance of Texas coastline

Community-level Observations (Radar Ornithology)

Cohen et. al. 2018

Spring Stopover Habitat
March - May
Conclusions:

- >395 Species & > 2 Billion individuals

- Variable migration pathways
  - Trans-Gulf & Circum-Gulf
  - Varies by Season & Species & Individuals

- Temporal Relevance
  - Spring Migration: March – May [Nocturnal and Diurnal]
  - Fall Migration: August – October [Nocturnal and Diurnal]
  - Resident Birds: Year Round
  - Transient Birds: May - August? (species nesting on Caribbean Islands, Islands of the coast of Africa, etc.)

- Spatial Relevance
  - Texas Coast & Mississippi River Delta
  - Barrier Islands
  - OCS shelf-break (~200m isobaths)
NRDA Aerial Surveys (early assessments)
Various Projects funded by DWH Trustee Implementation Groups
Gulf of Mexico Marine Assessment Program for Protected Species
Radar Ornithology [Birdcast.info]
eBird
Data from Various Publications on Individual Bird Movements
A New Tool with Lots of Potential Applications

www.birdcast.info
Birdcast.info - Migration Forecasts

18 April 2020 23:10 ET

Migration traffic rate [thousands/km/h]

- Active radar
- Inactive radar
- Sunset / Sunrise

www.birdcast.info
Adriaan M. Dokter, 2020
Available Data & Relevant Publications

- NRDA Aerial Surveys (early assessments)
- Various Projects funded by DWH Trustee Implementation Groups
- Gulf of Mexico Marine Assessment Program for Protected Species
- Radar Ornithology [Birdcast.info]
- eBird
- Data from Various Publications on Individual Bird Movements

Other Relevant Publications

- Lamb et al. 2020: *Ecological Drivers of Brown Pelican Movement Patterns, Health, and Reproductive Success in the Gulf of Mexico*
- R. W. Russell 2005: *Interactions Between Migrating Birds and Offshore Oil and Gas Platforms in the Northern Gulf of Mexico*
- Davis et al. 2000: *Cetaceans, Sea Turtles and Seabirds in the Northern Gulf of Mexico: Distribution, Abundance, and Habitat Associations*
- Ribic et al. 1997: *Distribution of Seabirds in the Northern Gulf of Mexico in relation to mesoscale features: Initial Observations*
## Estimates of Annual Avian Mortality in the United States

<table>
<thead>
<tr>
<th>Source of mortality</th>
<th>Estimated mortality</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vehicles</td>
<td>89 – 340 million (↑)</td>
<td>Erickson et al. (2001), Loss et al. (2014b)</td>
</tr>
<tr>
<td>Buildings and/or windows</td>
<td>365 – 988 million (↑)</td>
<td>Erickson et al. (2001), Klem (2009), Loss et al. (2014a)</td>
</tr>
<tr>
<td>Powerlines</td>
<td>Low Millions – 174 million (↑)</td>
<td>Manville (2005a, 2009), Rioux et al. (2013), Loss et al. (2014)(^a)</td>
</tr>
<tr>
<td>Communication towers</td>
<td>≥6.5 million (↑)</td>
<td>Manville (2005a, 2009), Longcore et al. (2012, 2013)</td>
</tr>
<tr>
<td>Mortality by cats</td>
<td>1.4 – 3.7 billion*</td>
<td>Dauphine and Cooper (2009, 2011), Loss et al. (2013a)</td>
</tr>
<tr>
<td>Mortality assoc. w/ open-pit oil ponds</td>
<td>500,000 – 1 million (↑)</td>
<td>Trail (2006)</td>
</tr>
<tr>
<td>Mortality assoc. w/ wind-farms (onshore)</td>
<td>140,000 – 679,000 (↑)</td>
<td>Smallwood (2013), Loss et al. (2013b)</td>
</tr>
<tr>
<td>Mortality assoc. w/ offshore oil platforms</td>
<td>200,000 – 321,000**</td>
<td>Russell (2005)</td>
</tr>
<tr>
<td>Mortality assoc. w/ commercial fishing</td>
<td>High thousands – low millions</td>
<td>Manville (2005b), Brothers et al. (2010)</td>
</tr>
<tr>
<td>Mortality assoc. w/ lead (Pb) ingestion</td>
<td>Millions (↓)***</td>
<td>Scheuhammer and Norris (1995), Kendall et al. (1996)</td>
</tr>
<tr>
<td>Mortality assoc. w/ insecticides/pesticides</td>
<td>Low Millions (↑)****</td>
<td>Mineau (2004), Mineau and Whiteside (2006, 2013)</td>
</tr>
</tbody>
</table>
Consultation & Technical Assistance

Initiate Leasing Process (RFI/Call)

Area Identification
Wind Energy Areas

0 ~ 1/2

Neighborhood Meetings/Plan

0 < 1/2

Publish Leasing Notices

0

Submit SAP

0

Site Assessment & Surveys
(maximum timeframe)

0 < 5

NEPA/Environmental Reviews

0

Auction

Submit COP
(with Project Design Envelope – optional)

BOEM Deems COP Complete & Sufficient

BOEM Approves COP

1

BOEM Reviews & Approves SAP

Installation Plans

Installation

2

Submit Design & Installation Plans
Thanks for your attention!

Questions??

Contact Information: randy_wilson@fws.gov