OVERVIEW
This document provides instructions and information for collecting data on seabird and marine mammal disturbance events at breeding colonies and roosting/haul-out sites within the North Coast Study Region (NCSR) of California’s Marine Life Protection Act.

OBJECTIVES
To document and investigate the extent and effects of disturbance to seabirds and marine mammals breeding and roosting along the California coast.

METHODS
Surveys of breeding and roosting seabirds and marine mammals along the California coast are conducted concurrently with other surveys from April through August. During all surveys, all potential and actual disturbance events will be documented, including both internal (i.e. human presence or interspecies events) and external (i.e. aircraft overflights within 1000’ altitude & within 1500’ horizontally, and marine traffic within 1500’, of island/colony/roosting location/haul-out) disturbances, even if no effect on animals is observed.

Disturbance data are collected during all surveys conducted: population transect, nearshore foraging, and breeding. It is important to record the number of birds and mammals present during the survey in order to determine proportion of animals affected, if any. For population transect surveys, the population counts are recorded in the population transect data book during the course of the survey. For nearshore foraging and breeding surveys, the population counts are recorded in the disturbance data book prior to the start of the survey. Figure 1 provides an example of how data are entered in the data book.

Data collection
The following data will be collected:
1. Date
2. Start/Stop time
3. Number and species of birds and marine mammals present (roosting/hauling out & breeding)
   *This may be recorded in the population transect data book during population transect surveys. If so, there is no need to record it in the disturbance data book. If the population transect survey has not taken place, record this information in the disturbance data book.
4. Time
5. Location
6. Duration
7. Number and species of birds/marine mammals disturbed, status, and reaction type (agitated, displaced, flushed).
8. Number of eggs/chicks affected (exposed, displaced, depredated)
9. Altitude and distance from nesting/roosting area affected.
10. Description of the source of disturbance
11. Photographic or video evidence

Description of data Collected:
1. **Date** the disturbance observation survey took place.

2. Record the **start and stop time** that observations began and stopped each day for standardization purposes

3. **Number and species** of birds and marine mammals present (roosting/hauling out & breeding)

   Record the number of roosting and breeding birds and hauling out mammals at the colony in order to monitor colony attendance. Roosting and breeding counts will be recorded for Brandt’s cormorants, pelagic cormorants, double-crested cormorants, western gulls, common murres, pigeon guillemots, and black oystercatchers; roosting only for brown pelicans; and hauling out counts for California sea lions, Steller sea lions, and harbor seals. A roosting bird is any bird visible that is roosting. For nesting birds, count the number of occupied nests (not birds) that are fair built or better. An occupied nest is a nest with an adult sitting (incubating posture), standing over eggs, and/or with chicks present.

4. Time the disturbance started. This may be unknown if the disturbance started before the observer arrived on site but continues after arrival. It is also unknown if the disturbance is a potential, not actual, disturbance.

5. Location of disturbance or if no disturbance was observed, the location where observations were made. These can be counting blocks or individually named features (e.g. Patrick’s Point, Trinidad Head)

6. Duration of time the source of disturbance or potential source of disturbance was present. Enter 0 if no disturbance.

7. Number, species, status, and reaction of birds or marine mammals disturbed.
   Only record data for birds that are roosting or breeding. If birds on the water/foraging are disturbed, you can make a note, but this information is secondary to birds that are roosting/breeding.

   Status includes:
- Breeding
- Roosting/Hauled out

Record the number of animals, their reaction type, and status. Reaction types include:
- **Agitated** (includes head bobbing (HB) for murres and wing-flapping (WF) or heads up alertness (HU) for cormorants and marine mammals).
- **Displaced** (moving from their nest or resting site)
- **Flushed** (birds flying off the rock/cliffs, marine mammals enter the water)

During disturbance events that cause animals to flush, displace, and/or become alerted,
- the **highest priority** is to quantify the number of animals that **flush**, followed by
  - the numbers **displaced**, followed by
  - whether or not animals were **agitated/alert** (with head bobbing and wing flapping having priority over general heads-up alertness).

It is assumed that when animals are flushing an additional number of animals are also displaced and alert. If individuals exhibit multiple disturbed behaviors, record the most extreme behavior:
(flushing > displacement > head bobbing/wing flapping > heads-up alert > not disturbed).

Also note whether animals returned to the area or returned to their normal behavior following a disturbance event, and the duration of time they exhibited disturbed behavior. If they did not return the area or did not return to normal behavior, give a brief explanation in the notes section.

When dealing with a large number of animals being disturbed, estimate the number disturbed to the best of your ability. In such cases, it is okay to estimate a percentage of the colony disturbed at the time, but you must know the total number of birds on the colony beforehand (Step 3) and use this to calculate the number of birds disturbed for entry on the datasheet and database.

8. During and following a disturbance, **scan and record the nesting area for eggs or chicks that were**:
   - exposed
   - displaced or
   - depredated

9. Altitude and distance from nesting/roosting area affected.

   Use whole numbers (not ranges) when recording altitude and distance, using units of **FEET**.
• Aircraft (disturbance/non-disturbance): record the approximate altitude and horizontal distance from the colony. Estimate altitude using the known elevation of your location and other landmarks of known elevation in the vicinity.

• Vessels that cause disturbance: record approximate distance from the colony when first disturbance is observed (e.g. when birds first begin headbobbing, displacing, or flushing) and also the closest distance. If flushing occurs after initial agitation, record distance of vessel when animals flushed in the notes.

• Vessels that do not cause disturbance: record the distance of closest approach to the colony.

• Other anthropogenic disturbance/non-disturbance: record as for vessels.

• Non-anthropogenic disturbance: record as for aircraft. If animal is in the colony, altitude is 0, distance is 0.

10. Description of the source of disturbance. Include the following:
   - Source
   - Activity of disturbance source
   - Identification of Information
   - Direction of travel
### Examples of Sources (not a complete list)

<table>
<thead>
<tr>
<th>Aircraft</th>
<th>Boat</th>
<th>Other Anthropogenic</th>
<th>Disturbance Only Non-Anthropogenic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plane</td>
<td>Commercial Fishing</td>
<td>Humans on Foot</td>
<td>List specific names of:</td>
</tr>
<tr>
<td>Helicopter</td>
<td>Private/Recreational Fishing</td>
<td>Fireworks</td>
<td>Birds of prey (falcons, hawks)</td>
</tr>
<tr>
<td>Ultralight</td>
<td>Charter/Party Research Vessel</td>
<td>Loud Noises</td>
<td>Other predatory birds (gulls, pelicans, corvids, etc.)</td>
</tr>
<tr>
<td>Model Plane</td>
<td>Sailboat</td>
<td>Motor Vehicle</td>
<td>Non-predatory birds (turkey vultures, etc.)</td>
</tr>
<tr>
<td>Hang glider/Paraglider</td>
<td>Yacht/Cruiser</td>
<td>Noise</td>
<td>Mammalian predators</td>
</tr>
<tr>
<td>Other (notes)</td>
<td>Speed Boat</td>
<td>Surfer</td>
<td>Other (notes)</td>
</tr>
<tr>
<td></td>
<td>Jet-Ski</td>
<td>Kite/Wind Surfer</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Kayak/Canoe/Self-Powered</td>
<td>Dog(s) on leash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Law Enforcement</td>
<td>Dog(s) off leash</td>
<td></td>
</tr>
<tr>
<td></td>
<td>US Coast Guard</td>
<td>Other (notes)</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Other (notes)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Activity of disturbance source

Aircraft, vessel, other anthropogenic and animal activity should be categorized as follows:

- Transiting (aircraft/vessel/other anthropogenic/non-anthropogenic)
- Circling (aircraft/vessel/non-anthropogenic)
- Research (aircraft/vessel/other anthropogenic)
- Emergency Search and Rescue (aircraft/vessel/other anthropogenic)
- Fishing (vessel)
- Sightseeing (e.g. kayaks, whale watching) (vessel)
- Diving (vessel)
- Other (notes)
- Unknown
Identification Information

Aircraft
At a minimum, record the type of aircraft. If possible, record additional information about the aircraft in the notes column. This includes tail or N-number, wing configuration (high/low), engine type (jet/propeller), number and position of engines (nose, wing, tail), color markings, and make of aircraft (e.g. Cessna, Bell Jet Ranger).

Boat
At a minimum, record the type of boat. If possible, record additional information about the boat in the notes column. This includes its CF identification number, vessel name, home port, length (include units), nationality, colors or markings.

Other Anthropogenic
At a minimum, record the source of disturbance. If possible, record license plate numbers, car make/model, number of individuals, and any other identifying information.

Non-anthropogenic
At a minimum, record the species, number of individuals, and behavior. If a predation event occurs, document the species and type of prey taken (e.g. adult murre, cormorant egg). In addition, any attempted or successful klepto-parasitism event should be recorded. It is not necessary to record conspecific disturbance (e.g. two cormorants interacting over a nest location), interactions between murres and cormorants, or alert-only responses to predators (e.g. a gull flying over the colony for an hour could elicit headbobbing from murres for the full hour).

Direction of travel
Record direction of travel of the aircraft/vessel/animal when it left the area (e.g. west, northeast, etc.).

11. Photographic Evidence
If possible, collect photographic and/or video evidence of anthropogenic disturbance. Try to obtain images that allow for individual identification of the aircraft/vessel. Zoom in to the identification numbers if possible. In addition, photos will optimally show the relation of the disturbance source to the nesting area affected, and the birds being disturbed. If you do not have a zoom lens, digiscoping is also effective. Record information about the camera used and the photo numbers in the notes field.
Figure 1. Example of how data are collected in the field data book.

<table>
<thead>
<tr>
<th>DATE</th>
<th>TIME</th>
<th>LOC</th>
<th>DUR</th>
<th>#/SP</th>
<th>STATUS</th>
<th>REACT</th>
<th>E/AFFECT</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/10</td>
<td>0630</td>
<td>CB1</td>
<td>6 min</td>
<td>0</td>
<td>BRAC</td>
<td>BEED</td>
<td>disp</td>
</tr>
<tr>
<td></td>
<td>0750</td>
<td>CB4</td>
<td>1 min</td>
<td>2</td>
<td>BRAC</td>
<td>BEED</td>
<td>disp</td>
</tr>
<tr>
<td></td>
<td>0910</td>
<td>CB9</td>
<td>1 min</td>
<td>2</td>
<td>NEGU</td>
<td>ROOST</td>
<td>flush</td>
</tr>
</tbody>
</table>

(skip a line between studies, when you are more comfortable w/ the data layout, you do not have to repeat the "header" information.

**Foraging Example**

<table>
<thead>
<tr>
<th>1200</th>
<th>1500</th>
<th>BRAC 25</th>
<th>5E</th>
<th>PECO 56</th>
<th>1020/1400</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>BRAC</td>
<td></td>
<td>NEGU 2/0</td>
<td></td>
</tr>
</tbody>
</table>

See pop xsect book for counts.

ALT/DIST | SOURCE | DESC/NOTES
---|--------|--------
0'/50' | Person tidepooling |
200'/1000 | Hucy #1 172 flies N along coast |
100'/1000 | Breeding BRAC settle in, flit, roost |
0'/200' | I walked around the corner and birds flushed. They returned after I moved on. |

**Breeding Example**

For foraging, focused breed surveys, record pop here.

BRAC 25 | 5E | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.

PECO 56 | 1020 | PECO 56 | 1020/1400 |

Breeding BRAC 25 flies E along coast from W-E, 5E alarm calls.