

Region-Wide Harbor Porpoise and Marine Wildlife Observation Protocol and Guide

Preparing to Observe

Choosing a location:

An ideal marine wildlife observation location has at least a 90° view of the water and an elevated vantage point. Try to choose a lookout close enough to the water to see animals near/on the shore. A study site guide and map of vetted sites can be found at www.pacificbio.org/initiatives/salish-sea/harbor-porpoise.html.

Keep in mind:

- Do not endanger yourself (or others) to reach an observation lookout.
- Respect private property and delicate shoreline ecosystems.
- If hiking is required to reach the observation location, wear appropriate footwear.
- Let someone else know where you are going and when you expect to be back.
- Observe with a partner for added safety in remote or rugged locations.

What to bring:

Observation equipment:

- Clipboard, datasheet, and writing utensil
- Compass or smartphone with compass app
- Binoculars or spotting scope
- Polarized sunglasses
- Rangefinder, optional

Wear:

- Sturdy shoes with good tread
- Wind/waterproof layers, top and bottom
- Insulating layers, top and bottom
- Hat with brim
- Sunscreen

Also recommended:

- Something comfortable to sit on
- Snacks
- water

Defining the Study Area

In order to standardize the unit of effort for each location, observers record only animals sighted within a certain distance from the observation site. The distance is based on the elevation of the site and the availability (if any) of landmarks. The distance/radius paired with field of view (see page 4) creates a pie-shaped **study area sector**.

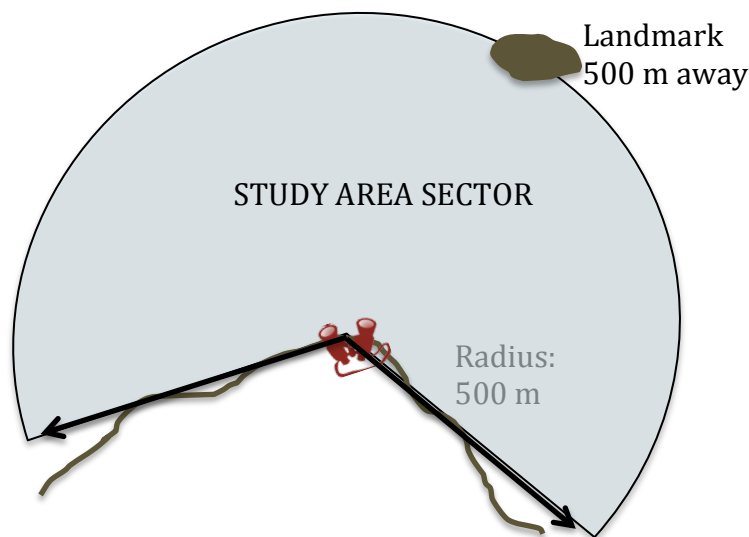


Fig. 1: example study area sector with radius 500 m

The radius of the study area sector should follow these guidelines:

- The ratio of radius to elevation should not *exceed* 20:1 (multiply elevation at eye level by 20 to find maximum recommended study area sector radius).
 - This ratio may be less than 20:1, however, if there is a landmark a shorter distance away.
- The minimum radius is 100 m.
- The maximum radius is 1000 m, regardless of elevation.

Elevations of official observation sites can be found in the study site guide. Otherwise, to find the elevation of your location, visit:

www.geoplaner.com

Select "Satellite" in the upper left-hand corner of the map image; click and drag to move the map; and select "+" / "-" in the lower right-hand corner of the map to zoom in/out. Each time you click a location on the map, a pin will be placed there and the location's information (including elevation) will appear at the top of the list on the right side of the screen. Be as exact as possible when placing pins.

If you have a laser rangefinder, you can use it to estimate the distance of objects (a landmark or animal) from your location. Take into account the fact that the rangefinder will actually measure the hypotenuse, C, of the triangle whose legs are A – your elevation and B – the distance of the object from your location. Use the Pythagorean theorem to calculate B.

$$B = \sqrt{C^2 - A^2}$$

(Note that some laser rangefinders calculate B for you; be sure of which kind you have.)

If you do not have a laser rangefinder, you can use Google Maps on a computer to find the distance of landmarks from your location. Right-click on either the landmark or the observation location and select "Measure distance," then click on the other location.



Fig. 2: Finding the sector radius using a landmark and Google Maps (EXAMPLE)

To estimate the boundary of the study area sector, hold your arm out straight in front of you, with your hand in the "thumbs up" position. Close one eye and line the tip of your thumb up with the landmark, then swing your arm in a level arc through your field of view. Your thumb will approximately trace the outer edge of the study area sector. With some exceptions (see below), do not record animals seen outside this boundary.

EXCEPTIONS:

1. If cetaceans (whales, porpoises, dolphins) are seen outside the study area sector and you can positively identify them, record them in the notes column, along with an estimate of their distance from the observation location.
2. For birds, the rule of thumb is: if it's close enough to identify, record it.

If your location does not have an appropriate landmark, you must use a tool like a rangefinder to determine if an animal is within range. Use the 20:1 radius-to-elevation ratio to determine the correct study area sector radius, not to exceed 1000 m.

Filling Out the Data Sheet

Header Data:

Fill out the top row of data about the time, environmental conditions, and location. See the datasheet for a key to filling out these data.

WEATHER: Some weather data you may choose to look up online after the observation. Weather Underground (www.wunderground.com) is an excellent resource; look up a weather station near your observation location and view its weather history. Use a single representative value for each datum.

TIDAL CURRENT: Tidal current is difficult to directly measure, so use your best judgment to estimate. Record "1" if the current is exceptionally strong (subjective: roiling, river-like current; objective: 4+ knots); "2" if it is moderate (perceptible motion; 1-3 knots); and "3" if the tide is slack (no perceptible motion; ~0 knots). For reference, the famous current at Deception Pass can reach up to 8 knots.

BEAUFORT #: This is a measure of wind speed, but we are only concerned with the sea state, i.e. how choppy is the water. Do not observe if whitecaps are present, as marine mammals cannot be reliably spotted and identified under those conditions.

LOCATION CODE OR NAME: Each official observation location has a four-character alphanumeric code; see study site guide. Home-based observers: enter "HOME." If observing from a different location, contact porpoise@pacificbio.org and we will assign the location a code.

FIELD OF VIEW: Take a compass or a smartphone with a compass app to the observation lookout. Due north is 0° , due east is 90° , due south is 180° , due west is 270° . Use the compass to estimate your field of view and record the range of bearings in the header data “Bearing: Max Left” and “Bearing: Max Right” cells. Record to the nearest 5° .

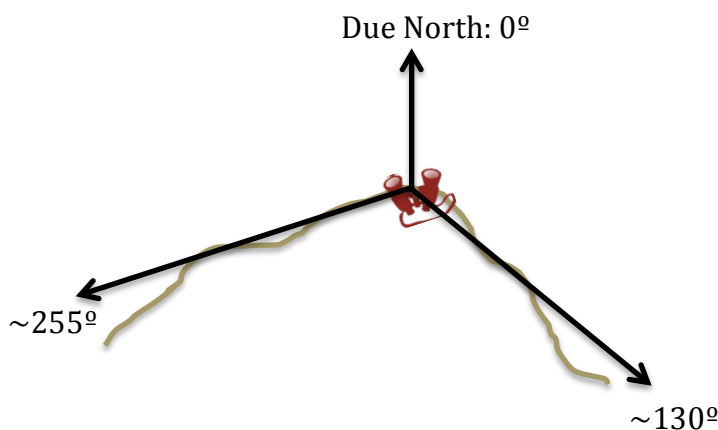


Fig. 3: Describing your field of view: “Max Left” and “Max Right” bearings

If using a smartphone compass app, take a bearing by holding the phone flat and pointing the top of the phone in the direction of interest. You may need to first calibrate your smartphone compass by rotating the phone several times in succession around each axis; repeat the process multiple times, if necessary.

Ten-Minute Intervals:

We break observations up into 10-minute intervals in order to calculate a “fraction of time present” value for each wildlife species observed. Each row of data represents a 10-minute interval. Begin each time interval on the zero; for example, begin recording data at 10:40:00 and continue until 10:49:59, then at 10:50:00 move on to the next row of data. To begin your observation session, find the appropriate row for the minutes (in the example above, record data in the row marked “41” in the minutes column, denoting the 41st minute of the hour) and write the hour into the hour column. Use 24-hour clock notation.

Recording Data: Animals

Download the species ID guide at www.pacificbio.org/initiatives/salish-sea/harbor-porpoise.html.

HARBOR PORPOISES: Harbor porpoises are the main focus of this Pacific Biodiversity Institute research project. We collect more detailed data on the harbor porpoises than on other mammal and bird species. These additional data consist of:

1. **Compass bearing.** This is the position of the porpoises relative to your location, measured in degrees, where due north is 0°. When porpoises are sighted, take their bearing. Observe them throughout the 10-minute interval and record the bearing (to the nearest 5°) that is representative of their average location for that interval.
2. **Behavior.** Three categories of behavior can be recorded in the “Beh” column, and specifics or unusual behavior should be recorded in the “Notes” column (email porpoise@pacificbio.org with questions). The behaviors are:
 - i. Foraging (F). At least one porpoise surfacing repeatedly in the same general area, often facing a different direction each time it surfaces. Frequently accompanied by other animal activity in the same area, e.g. noisy flock of gulls, seals, hunting raptors, etc.
 - ii. Traveling (T). At least one porpoise moving continually in the same direction. Traveling porpoises often surface 3-4 times in quick succession followed by a longer dive.
 - iii. Socializing (S). Two or more porpoises swimming close enough to touch, rubbing on each other, and/or splashing, tail slapping, spyhopping, etc.
3. **Groups** of harbor porpoises. The compass bearing, number, and behavior of up to four groups of harbor porpoises may be recorded under the appropriate column headers; any additional groups should be recorded in the “Notes” column. Groups of harbor porpoises are defined in one of two ways:
 - a. Their behavior. If three porpoises are foraging somewhere in your field of view and one porpoise travels across your field of view without stopping to join the foraging animals, these are two groups and you should record them in two sets of columns.
 - b. Their location. For example, if one porpoise’s average compass bearing during the 10-minute interval is 125° and during the same interval, three porpoises have a bearing of approximately 210°, those are two groups.

At the end of the observation session, estimate the total number of different individual harbor porpoises you saw and enter the number in the “# HP” cell in the top row of data. If unsure, be conservative.

OTHER ANIMALS: Other marine/marine-adapted mammals and birds are tallied in the appropriate column. If you can identify the species or other details, write it in the “Notes” column in addition to tallying. Also record in the “Notes” column any species that is not represented by the columns. Record non-porpoise species’ behavior in the “Notes” column; behaviors could include foraging, flying, swimming, resting, etc. If there are large numbers of an animal, make a rough estimate and write the number in the tally cell.

We have designated four categories of birds that are commonly seen in the marine environment: raptors, shorebirds (including waders), "duck-like" birds, and "gull-like" birds. The common names—family, genus, or species level—of birds that fit into each category are listed in the chart below. This list is not exhaustive.

Bird: Raptor	Bird: Shore	Bird: Duck-like	Bird: Gull-like
Bald eagle Osprey	Heron Oystercatcher Killdeer Sandpiper Curlew	Scoter Harlequin duck Loon Grebe Cormorant Common murre Pigeon guillemot Marbled murrelet Rhinoceros auklet Tufted puffin	Gull Shearwater Tern Pelican

IMPORTANT: We are not trying to count individual animals; we are trying to track presence/absence and abundance of animals over the duration of the observation session. Therefore, if any individual animal remains in the study area for multiple 10-minute intervals, record it in every time interval for which it was present.

Recording Data: Boats

Tally boats moving under motor power through the study area sector in the "Boats" column. Tally each boat once, when it first enters the study area sector.

How to Use the "Notes" Column:

Write as much detail as you can in the "Notes" column for each 10-minute interval. You may even wish to record notes on a separate sheet of paper. You will type your data and notes into a digital form to submit the data; the cells in the digital form have no character limit, so be as detailed as possible (but also try to be clear and succinct!). These notes can consist of...:

- Specific harbor porpoise behavior
- Unusual harbor porpoise behavior
- Presence of harbor porpoise mother/calf pairs
- Fifth and subsequent distinct groups of harbor porpoises
- Species-level identification of birds or other animals
- Species not represented by a tally column
- Behavior of birds and other animals

- Cetaceans outside of the study area sector
- Details of boat traffic
- Any other unusual or notable events that take place during the time interval, related to marine animals, other animals, human activity, weather, etc.

Submitting Data

An Excel file of the datasheet can be downloaded at <http://pacificbio.org/initiatives/salish-sea/harbor-porpoise.html>.

Each time you conduct an observation, make a duplicate of this file and rename it with the date of the observation, the 4-character location ID code (see study site guide, or use HOME for home-based observations), and your last name, all separated by an underscore.

File naming convention: YYYYMMDD_LocID_Lastname

Example: 20160726_WP03_Smith

Copy the completed datasheet into the Excel spreadsheet, typing as much as needed in the "Notes" cells.

IMPORTANT: If you looked for but did not see a category of animals or boats, write a 0 in the cell; do not leave it blank. (An observation of 0 animals or boats is a valuable observation!) If you chose not to count either marine mammals or birds because you could not identify them or wished to focus only on certain categories of animal, leave the cell blank to show you were not trying to count them. Leave all cells blank for 10-minute intervals in which you did not observe, including time intervals in which you were significantly distracted or took a break.

Email the digital datasheet as an attachment to Aileen Jeffries, aileen@pacificbio.org, and the Harbor Porpoise Project email address, porpoise@pacificbio.org.

This datasheet can be printed at home. Be sure to fit the datasheet to 1 page, for ease of use.

If you are unable to use Excel, please contact porpoise@pacificbio.org to arrange an alternative way to submit data.

Other Information

Observer Calendar:

Please try to conduct observations on a regular basis (e.g. two two-hour sessions per month). To help keep yourself and us on-track and up-to date, please schedule your

observations sessions ahead of time on our volunteer calendar by visiting www.pacificbio.org/initiatives/salish-sea/volunteer-calendar.html.

Duration of Observations:

Observations can be any multiple of 10 minutes in duration, up to 3 hours (including breaks). If you choose to extend your observation session or cut it shorter than originally planned, base the decision on factors other than the presence or absence of wildlife, to avoid skewing the data.

Monitoring the Study Area:

Be sure to check all areas of the study area sector—from the nearshore to the boundary, and from the left-hand extreme of your field of view to the right. Find a strategy that works for you—gaze at all areas of the water, circle your eyes from one area to another, or sweep your eyes back and forth across the water. Also use your ears; marine mammals can sometimes be heard taking breaths at the surface, and birds are famously vocal.

Outreach on the Bluff

Passersby are often curious about what Harbor Porpoise Project citizen scientists are up to, sitting on the bluff with binoculars and clipboard. If they ask you questions, please respond in as friendly and polite a manner as possible. You are the Harbor Porpoise Project's PR reps on the bluff! The more people walk away with increased knowledge and positive feelings towards the Harbor Porpoise Project, the better able we will be to achieve our goals in the Salish Sea community.

Bringing some Harbor Porpoise Project literature to the bluff with you is a good way to either maximize *or* minimize your time spent talking to the public. (Hand out literature and use it as a talking point... or hand out literature in lieu of a in-depth conversation.) If you wish, you may obtain a collection of literature from PBI staff member (email porpoise@pacificbio.org), to help you conduct opportunistic outreach during your observations.

And finally...

THANK YOU

**for your valuable contribution to Pacific Biodiversity Institute's
scientific research!**

Once you have completed 20 hr of observations and/or outreach, you will receive a prize!

