**Very rough draft outline for proposed 2014 Tufted Puffin Surveys**

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**Objective**

Assess changes in measures of tufted puffin breeding season activity (# birds on water, # circling, # entering burrows, etc.) as an indirect measure for assessing changes in the condition of Washington’s puffin population and as an indirect measure of annual reproductive success.

**Sites**

All occupied sites identified in our earlier study.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **COL\_NUMBER** | **SITE\_NAME** | **LatDecDeg** | **LongDecDeg** | **Survey Points** | **Approx dist from Marina (nm)** |
| 155001 | Tatoosh Island | 48.392471 | -124.736543 |  | 32 |
| 155008 | White Rock | 48.135478 | -124.732570 | ne | 16 |
| 155010 | Carroll Island | 48.004778 | -124.723922 | ne, sw | 8 |
| 155039 | Silver Sides | 48.252764 | -124.709710 |  | 24 |
| 155058, 59 | West & Middle Bodelteh Islands | 48.175858 | -124.763684 | n, s | 20 |
| 174002 | Cake Rock | 47.931929 | -124.684984 | n, s | 3 |
| 174007 | Rounded Island | 47.830375 | -124.555002 | e, w | 6.2 |
| 174010 | Alexander Island | 47.798066 | -124.506946 | n, s | 8.5 |
| 174016 | Destruction Island | 47.675264 | -124.484231 | nw, se | 15 |
| 174017 | Willoughby Rock | 47.410795 | -124.355032 | s | 32 |
| 174027 | Jagged Island | 47.997224 | -124.695735 | n, s | 8 |
| 174041 | Kohchaa (uh)(Petrel) | 47.909994 | -124.650776 | wsw | 0.5 |
| 174049, 49 | Huntington & Cakesosta | 47.883567 | -124.638015 | ne, w | 1.5 |
| 174101 | Erin | 47.299948 | -124.267886 | ?sw | 40 |
|  |  |  |  |  |  |
| 156035 | Protection Island | 48.127717 | -122.928632 |  | 6 |
| 156034 | Smith Island | 48.320910 | -122.831091 | nw, sw | 17 |

**Time of day**



Any time between 06:00 and 14:00 and between 20:00 and 22:00 based on our activity surveys from Tatoosh. Note: would be nice to have a similar activity graph for Smith/Protection because activity could vary between systems (California Current vs. Salish Sea)

**Field Methods? (this is from a report)**

Group observations into 15 minute observation periods (not moving) and the periods “moving” between 15 minute observation periods (for larger rocks/islands). Indicate location of 15 minute count (e.g., just off “east side of Kanem Spit”) and the area covered while “moving” (e.g., “Marina to Kanem Spit”). If a small rock indicate side for location N, NE, NW, W, E, etc. Record only new birds during each observation period or while in transit. Observation points are located within 50 meters from shore unless reefs or shallow water precluded closer approach. Moving surveys were conducted at a speed of 5-7 mph. The number of 15 minute stationary counts was based on the number of locations needed to observe all sides of an island with suitable nesting habitat (grassy areas with soil available for burrows) during counts. For example, because Protection Island is very large, we drove around the island and stopped at 4 locations for 15 minutes each so that the entire potential nesting habitat was observable during 15 minute counts. For some islands, we could not drive all the way around the island because of shallow water and exposed/submerged rocks. If only one side of an island had suitable then we only spent time on that side of the island. In all cases we could observe the entire potential nesting habitat from the water except for the very top of the islands.

Experienced observers visited islands using either a 19’ or a 22’ Guardian Whaler.

**Species**

Tufted Puffins: During each visit, document the number of puffins on the water, flying and standing on the cliff face based on when it was first observed. The total number of Puffins observed per visit will be the total number of birds observed flying, on the water and on the cliff face. Also record evidence of breeding including burrow entry or departure and birds carrying fish. Birds entering and exiting burrows should be recorded for the count total as flying. Similarly, birds carrying fish should be recorded for the count total under in flight, on water, or on cliff face based on when it was first observed.

Other species: Also record the following other species observed on the island or on the water (where appropriate):

Black Oystercatcher

Brandt's Cormorant

Brown Pelican

Common Murre

Double-crested Cormorant

Glaucous-winged Gull

Pelagic Cormorant

Pigeon Guillemot

Rhinoceros Auklet

Western/Glaucous-winged Hybrid

Bald Eagle (record adult and juvenile separately)

Common Raven

Peregrine Falcon

Do not count other species in flight unless they are observed on the water (where appropriate) or landing on the island during the survey.

For all visits, Beaufort wind scale was 2 or less and swell heights were 4 feet or less

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Force** | **Speed** | | | **Name** | **Conditions at Sea** | **Conditions on Land** |
| **knots** | **km/h** | **mi/h** |
| 0 | < 1 | < 2 | < 1 | Calm | Sea like a mirror. | Smoke rises vertically. |
| 1 | 1-3 | 1-5 | 1-4 | Light air | Ripples only. | Smoke drifts and leaves rustle. |
| 2 | 4-6 | 6-11 | 5-7 | Light breeze | Small wavelets (0.2 m). Crests have a glassy appearance. | Wind felt on face. |
| 3 | 7-10 | 12-19 | 8-11 | Gentle breeze | Large wavelets (0.6 m), crests begin to break. | Flags extended, leaves move. |
| 4 | 11-16 | 20-29 | 12-18 | Moderate breeze | Small waves (1 m), some whitecaps. | Dust and small branches move. |
| 5 | 17-21 | 30-39 | 19-24 | Fresh breeze | Moderate waves (1.8 m), many whitecaps. | Small trees begin to sway. |
| 6 | 22-27 | 40-50 | 25-31 | Strong breeze | Large waves (3 m), probably some spray. | Large branches move, wires whistle, umbrellas are difficult to control. |
| 7 | 28-33 | 51-61 | 32-38 | Near gale | Mounting sea (4 m) with foam blown in streaks downwind. | Whole trees in motion, inconvenience in walking. |
| 8 | 34-40 | 62-74 | 39-46 | Gale | Moderately high waves (5.5 m), crests break into spindrift. | Difficult to walk against wind. Twigs and small branches blown off trees. |
| 9 | 41-47 | 76-87 | 47-54 | Strong gale | High waves (7 m), dense foam, visibility affected. | Minor structural damage may occur (shingles blown off roofs). |
| 10 | 48-55 | 88-102 | 55-63 | Storm | Very high waves (9 m), heavy sea roll, visibility impaired. Surface generally white. | Trees uprooted, structural damage likely. |
| 11 | 56-63 | 103-118 | 64-73 | Violent storm | Exceptionally high waves (11 m), visibility poor. | Widespread damage to structures. |
| 12 | 64+ | 119+ | 74+ | Hurricane | 14 m waves, air filled with foam and spray, visibility bad. | Severe structural damage to buildings, wide spread devastation. |

**Number of Visits/Site/Season**

Ideally 3 visits. Allows us to look at some seasonal change, continue to assess occupancy and to cover both the early season and provisioning periods (see below).

**Season Window?**

This needs a lot more thought but my initial suggestion is to get an early season (second half of May) count to determine occupancy type of activity and then some late season visits (July – mid August) to assess activity associated with provisioning. I spent a bit of time looking at our data of activity patterns across the season and there is some suggestion of a slow window in June when birds are incubating. Thoughts?