

**From:** [Loverti, Vanessa](#)  
**To:** [BrownScott, Jennifer](#); [Kilbride, kilb](#)  
**Subject:** Todays Call  
**Date:** Monday, April 5, 2021 11:46:00 AM  
**Attachments:** [2018.08.30\\_WWS\\_SOP\\_USGS.pdf](#)

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Hi Jennifer and Kevin,

Thank you for allowing me to sit in on the meeting today. I suppose it would have been good to talk prior to this meeting (for me). It seems as if they are very anxious to start the project by June of this year (wow). I have not really had a chance to think about this project or look into the specifics.

I would hope that shorebirds will still use this site as foraging habitat. I am sure this is political, and it would be good to make sure we are all on the same page, so I do not misspeak. I will go back and read the refuges responses to this project.

If birds are not using the 5 acres during full operation because of disturbed than that would be important to know for other phases of the project.

Attached is an example of the type of project that addresses refuge specific questions on habitat use (although not the same question). One question we might ask Willapa NWR is...with these surveys are they seeing shorebirds in oyster farming habitat. Just a few thoughts.

It took me off guard that they wanted to launch right into things. Happy Monday morning:)

Vanessa

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# Willapa Bay Waterbird Survey SOP

Revised: 8/30/18



USGS SFBE: Susan De La Cruz, David Nelson, Isa Woo, Stacy Moskal, Margaret Tzen

in partnership with: USFWS Willapa NWR: William Ritchie, Khem So, Jackie Ferrier

## Purpose and Objective

The Willapa Waterbird Survey is a grid-based nearshore survey with the goal of collecting baseline avian and habitat data for the Willapa Bay estuary. This research will be fundamental in tracking bird response to habitat changes in the Bay and evaluating the health and vitality of the ecosystem and our trust species.

The objective of this Standard Operating Procedure (SOP) is to prepare volunteers to accurately count and estimate the relative position of all waterbird species observed in a survey area. This SOP will standardize survey methodology to minimize variability among observers.

This waterbird survey SOP was derived from USGS SFBE waterbird survey protocols, USFWS Survey Protocol Handbook (USFWS 2013), USFWS draft National Protocol Framework for the Inventory and Monitoring of Migratory Shorebird, Point Blue Conservation Science Area-Search Protocol for Surveying Shorebirds in Coastal Environments, Program for Regional and International Shorebird Monitoring (PRISM; 2002), International Association of Fish and Wildlife Agencies (IAFWA) Monitoring Avian Conservation: Rationale, Design, and Coordination (2004).

## Sampling Design

Fifteen 1 km<sup>2</sup> survey areas were selected around the periphery of Willapa Bay using Generalized Random Tessellation Stratified (GRTS) spatial sampling methodology (Fig. 1). Each survey area is divided into 16, 250 m<sup>2</sup> grids (Fig. 2). Habitat composition for each grid was characterized using historic data and will be re-evaluated annually using aerial imagery or land observation. Habitat types of interest are: eelgrass species (*Z. japonica*, *Z. marina*), bare mudflat, and tideland aquaculture. Avian survey data will be analyzed with associated habitat data to understand how birds respond to habitat change.

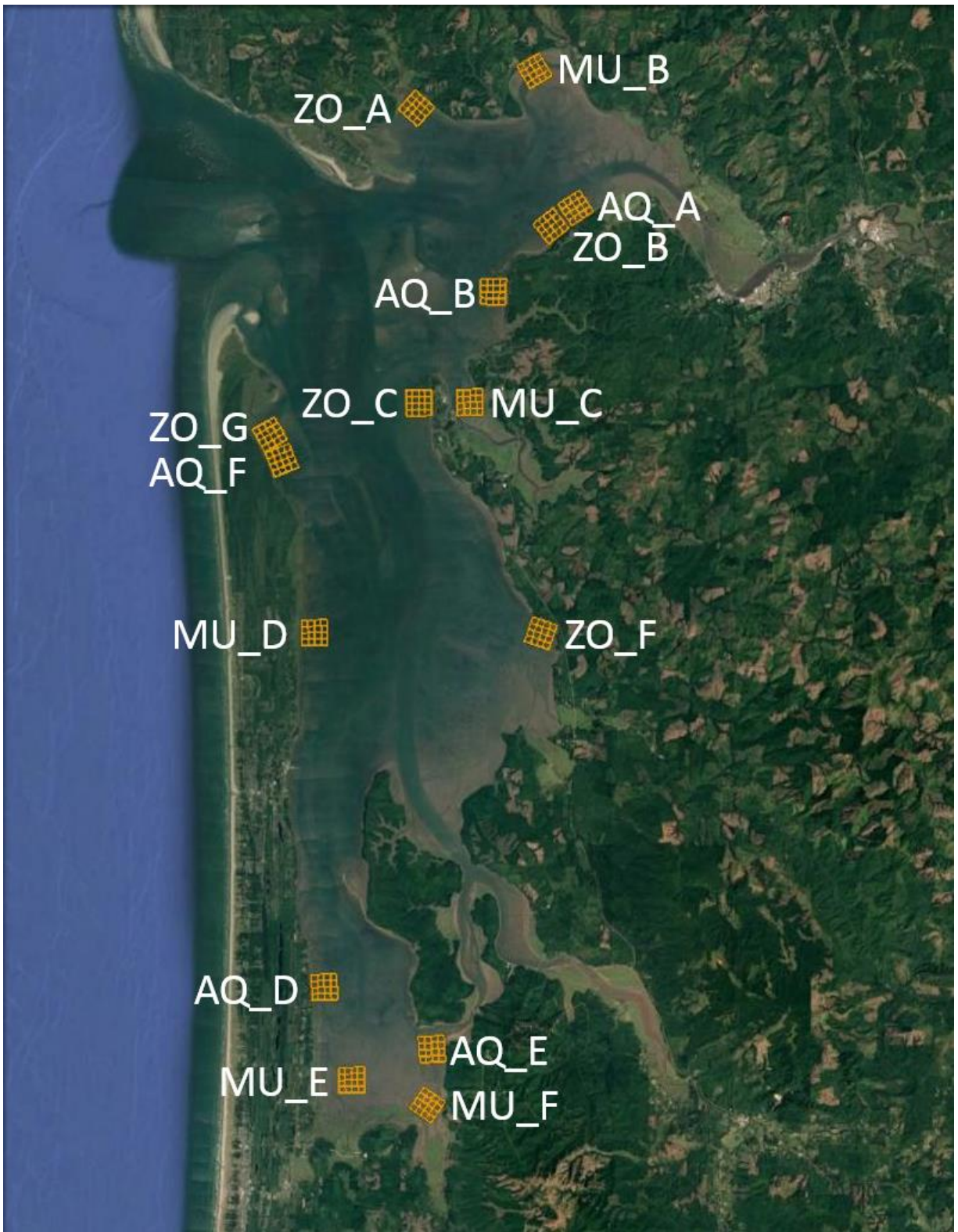


Figure 1: Survey Sites around Willapa Bay

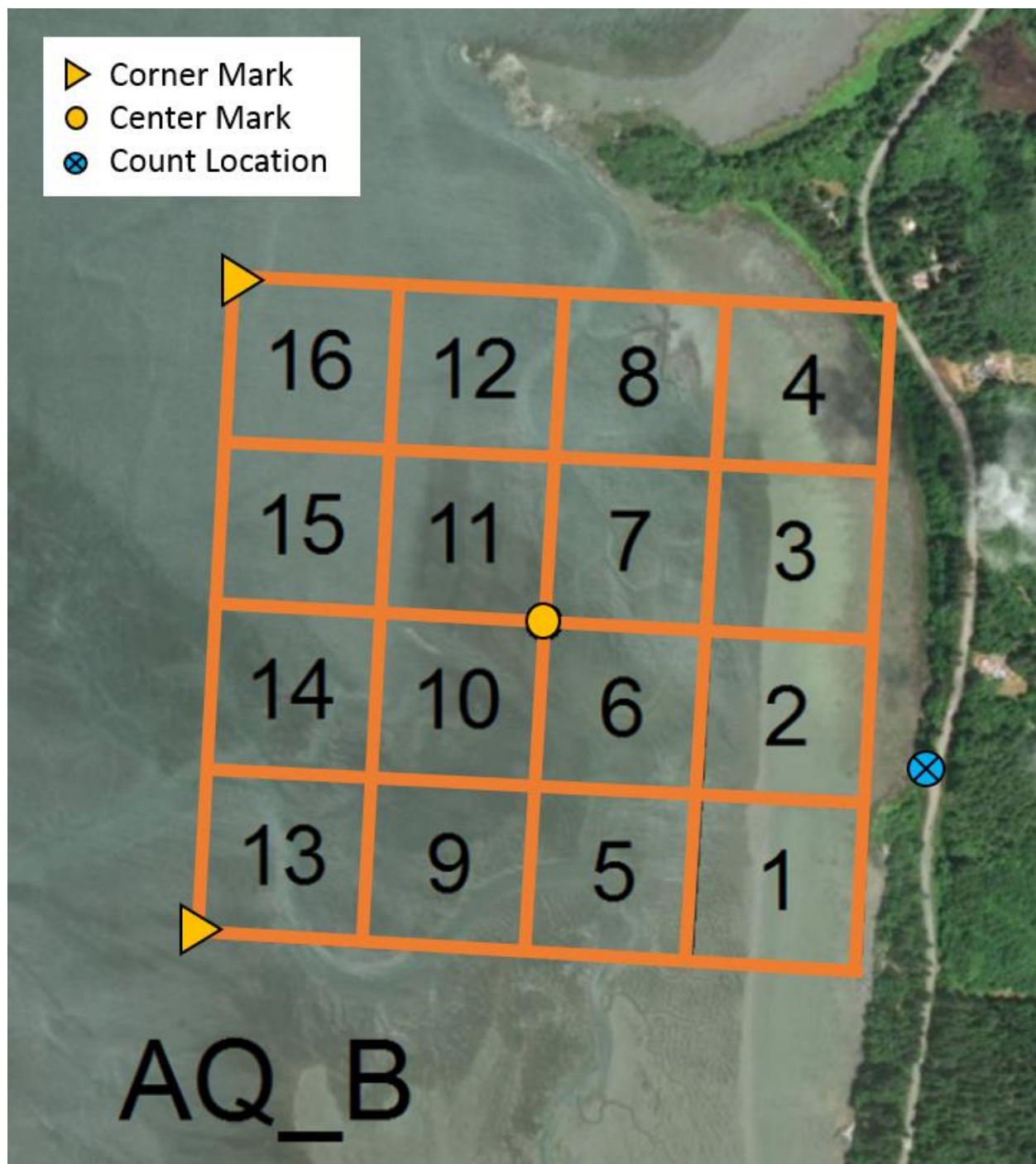


Figure 2: Map of Survey area AQ\_B. Visual aids deployed at the far corners and center of grids, as well as others reference points marked on survey maps will assist the observer in estimating distances.



## Equipment List

- Datasheet (using a laser jet printer on Rite in the Rain paper), or Rite in the Rain Field Books
- Pencils
- Clipboard
- Gridded maps of each of the pertinent survey areas
- Standard Operating Procedure (this document)
- Tripod
- Spotting scope (20x - 60x magnification)
- Binoculars
- Cell Phone (Verizon service appears to have best coverage of Bay)
- Survey location access (some sites will require land owner notification or other procedures)
- Watch or phone to record start and end times
- Bird guide (i.e., Sibley's Field Guide to Birds of Western North America)
- Personal protective equipment (i.e., rain jacket, layers, reflective vest)
- Personal supplies (i.e., water and snacks)

## Timing

The waterbird surveys are intended to capture spring (March, April, May) and fall (September, October, November) migration. The day before your survey date, check the time of the starting tide height for your survey site with your survey coordinator (David Nelson, [davidnelson@usgs.gov](mailto:davidnelson@usgs.gov) or Vanessa Loverti, [vanessa\\_loverti@fws.gov](mailto:vanessa_loverti@fws.gov)). As these are predicted tides, arrive 1 hour before your predicted start time to allow for effects of barometric pressure and weather on tide heights. The goal is to complete the survey within a 90-minute tide window at a specific tidal height. Should your survey take longer than 90 minutes, record an explanation in the notes section of the datasheet. With experience, these surveys should not take much longer than 1 hour.

*Starting Tides Heights:* The tide heights below were chosen such that the observer begins the survey at an ebb (receding) tide where <20% of tide flat is exposed within the survey area. This allows for mixed use by both shorebirds and waterfowl of all grids within the site. If the survey area is not exposed at the predicted start time, (ex: due to fresh water influence from a rain event) wait for the grids closest to shore to expose by 20% OR 30 minutes (whichever comes first) and proceed with the survey.

Site	Tide Station Reference	Starting Tide Height (ft)
ZO_A	Toke Point	5
MU_B	Toke Point	5
AQ_A	Toke Point	4.5
ZO_B	Toke Point	4.5
AQ_B	Toke Point	4.5
ZO_C	Toke Point	5.5
MU_C	Toke Point	5
ZO_G	Toke Point	7
AQ_F	Toke Point	7
MU_D	Nahcotta	5

ZO_F	Nahcotta	4.5
AQ_D	Tarlatt Slough	5
MU_E	Tarlatt Slough	7
MU_F	Tarlatt Slough	7
AQ_E	Tarlatt Slough	4.5

## In the field

### Bird Counts

To maintain a consistent viewing location, always conduct surveys from the single observation point identified on the gridded aerial map for each survey site. Take a moment prior to the starting the survey to orient the grids. Use landmarks, channel markers/aquaculture, etc. on the aerial map to conceptually place grids on the landscape. The far corners of each survey area are demarcated by PVC posts with orange triangles and a plain yellow or orange PVC post marks the center of the study area. Using the gridded aerial maps record the following information on the datasheet for each grid:

#### *Datasheet header*

- Survey Area = name of the 1 km<sup>2</sup> survey area
- Date = date survey occurred
- Observer = name of counter
- Recorder = name of recorder
- Weather (wind, precipitation, cloud cover) conditions (see footnote on datasheet)
- Tide = predicted tide height at predicted start time
- Start Time = survey start time
- End Time = survey end time
- Grid(s) of tide line at start of count = indicate the grid(s) where the tide line is located at the beginning of the survey
- Disturbance = if at any time during your survey, you notice birds flushing or acting erratically, attempt to determine the cause.
  - Known Cause
    - the identity of the cause (CORA, BAEA, boat, aquaculture staff)
    - time of disturbance
    - effect of disturbance (e.g. 400 WESA moved 2 grids over)
  - Unknown Cause
    - time of disturbance
    - effect of disturbance (e.g. 400 WESA moved 2 grids over)
- Notes: Record notes that pertain to the whole survey (e.g. heat waves)

#### *Datasheet records*

- Time = start time of grid
- Grid = location of birds
- Species = 4-letter North American Bird Code for the species – Appendix A ([http://www.wec.ufl.edu/birds/SurveyDocs/species\\_list.pdf](http://www.wec.ufl.edu/birds/SurveyDocs/species_list.pdf))
  - If you cannot identify individual to species, indicate “UNK” and try to indicate the appropriate

guild. For example: “UNK SMALL SHOREBIRD” or “UNK DABBLER”

- Count = Number of individuals of each species and for each behavior
- Behavior of bird: Foraging (F), Roosting (R).
  - Foraging includes behaviors such as a GREG stalking fish, or a WESA probing mudflat.
  - Roosting is anything that is not foraging behavior (roosting = preening, sleeping, resting, social, etc.).

#### *Your priorities*

- First priority is to get an accurate count. If a large group of birds spans grid cells, count birds first and make an educated guess about how many were in each grid.
- Second priority is species. Large mixed-species flocks can be counted as a whole first, then you can go back through and start subtracting out species. You can either do this by counting the least numerous species and subtracting from the total, or you can look at the flock and calculate an estimate of the proportions. For example, you count a flock of 1000 birds, you see that only about 5% are RUDU, with the remainder divided equally between CANV and SCAU. That would mean you had 50 RUDU, leaving you with 475 CANV and 475 SCAU.
- Last priority is placement. Do your best to place birds in the appropriate grid but, remember that flocks move and the tide window is limited, so don't take too much time getting the perfect placement at the sake of the overall accuracy of the habitat use as a whole.

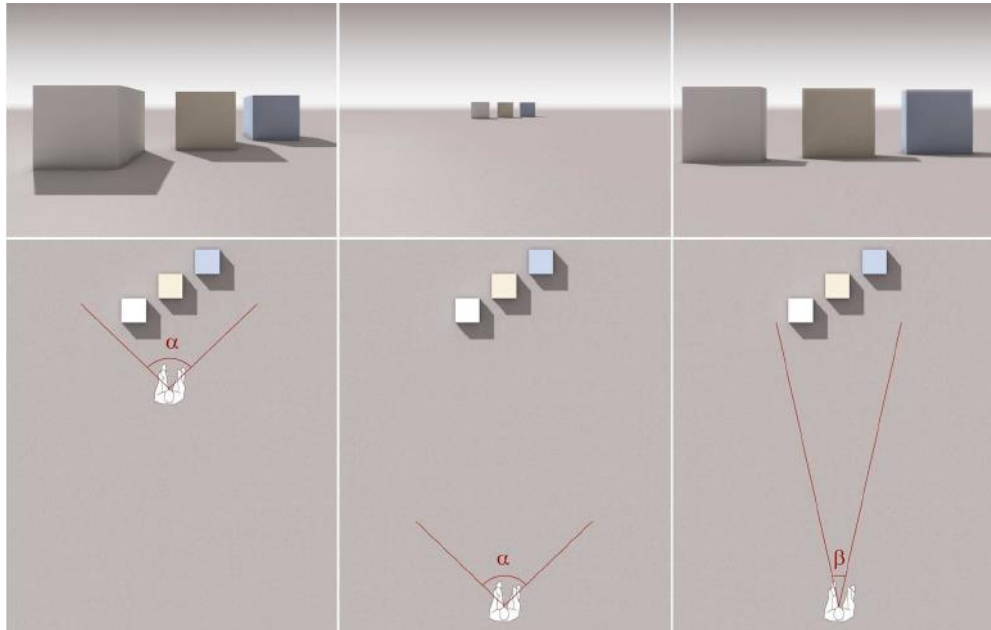
#### *Do I count these birds?*

- Do not count
  - Passerines except corvids.
  - Birds flying overhead (e.g. in transit) and NOT using the area.
- DO count flying birds if:
  - Flying is how the bird uses the habitat—such as a raptor or tern. They use the habitats by flying above them to forage, (e.g. a FOTE peering into the water and diving from above) so you'd count this flying behavior as foraging.
  - Something (predator, boat, person, you) flushed birds away from your survey area before you could count them in a grid.
    - Do your best to count and ID as they fly before you lose sight of them.
    - Estimate which grid they flushed from.

#### *Comments and additional notes*

- Only should be recorded if they directly apply to the value/quality of the data
- Should be written on the appropriate section of the datasheet. For example, notes that apply to the whole count belong at the bottom of the first page of the count in the NOTES section. Notes that apply to data collected at one sub-grid for a single species should be written on the line that applies to that sub-grid and species.

## Tips and Reminders



- The figure above illustrates the ways in which perceived distances between objects in space can change when the distance from object to observer is varied and when magnification is increased. Practicing counts with stationary objects placed at known distances can help improve your ability to judge distance and place birds into survey grids.
- Approach count locations cautiously to avoid flushing birds unnecessarily.
- Pay attention to your birds to avoid double counting. If you count the same bird in the same grid twice (or different grids, if the bird moved), you're duplicating effort and introducing bias to the data.
- The count should be the closest you can come to a single snapshot in time. If you've already counted a grid then a new flock shows up from outside the survey area, do not count them. If, however, that flock moved from a grid you had not yet counted, you do need to count them, and if possible, place them in the grid from which they came.
- Don't erase or black out mistakes. If you want to make a correction, cross out using a single line, and then rewrite the data. If you make a big change, write an explanatory note.
- Do the math later. It is acceptable to write out "E4 NSHO 2F+38F+12R+250F" meaning: Grid E4, Northern Shoveler, 2 Foraging + 38 Foraging + 12 Roosting + 250 Foraging" in the field, for example, and add it up later.
- Maximize the amount of time you have to count birds: calculate timing of gathering gear and driving/boating to the survey location so you will be ready to count when the tide window starts.

## Other resources

- Shorebirds: [PFSS Shorebird Survey Training Resources](#)
- Waterfowl: [USFWS Ducks at a Distance](#)
- Estimating Flock Size: [USFWS Aerial Observer Training and Testing Resources](#)  
<https://wildlifecounts.com/> (Hodges, J. I. 2014. Computerized simulation for learning the skill of wildlife count estimation)



## WILLAPA BAY WATERBIRD SURVEY

Entered?

## Survey

Area:

Date:

Observer/Recorder: /

Wind: Calm    Light    Breezy

Precipitation: 0 1 2 3 4

% Cloud Cover:                      Tide:

Tide: \_\_\_\_\_

**Disturbance (time and source):**

Start Time

End Time:

sub-grid (s) of tide line at start of count:

[illegible]

NOTES:

Wind Codes (mph): Calm = 0-5 Light = 6-10 Breezy = 11-20 Precipitation Codes: 0 = none 1 = light mist/fog 2 = light rain 3 = moderate rain 4 = heavy rain

**Appendix A - American Ornithological Union (AOU) Bird Species List**

4-letter code	Common Name	4-letter code	Common Name
AMCO	American Coot	LTJA	Long-tailed Jaeger
AMCR	American Crow	MALL	Mallard
AMKE	American Kestrel	MAGO	Marbled Godwit
AWPE	American White Pelican	MAMU	Marbled Murrelet
AMWI	American Wigeon	MERL	Merlin
ARTE	Arctic Tern	MEGU	Mew Gull
BASA	Baird's Sandpiper	NOFU	Northern Fulmar
BAEA	Bald Eagle	NOHA	Northern Harrier
BEKI	Belted Kingfisher	NOPI	Northern Pintail
BLOY	Black Oystercatcher	NSHO	Northern Shoveler
BLTU	Black Turnstone	OSPR	Osprey
BBPL	Black-bellied Plover	PAGP	Pacific Golden-Plover
BFAL	Black-footed Albatross	PALO	Pacific Loon
BLKI	Black-legged Kittiwake	PAJA	Parasitic Jaeger
BWTE	Blue-winged Teal	PESA	Pectoral Sandpiper
BOGU	Bonaparte's Gull	PECO	Pelagic Cormorant
BRAC	Brandt's Cormorant	PEFA	Peregrine Falcon
BRAN	Brant	PBGR	Pied-billed Grebe
BRPE	Brown Pelican	PIGU	Pigeon Guillemot
BBSA	Buff-breasted Sandpiper	PFSH	Pink-footed Shearwater
BUFF	Bufflehead	POJA	Pomarine Jaeger
BULS	Buller's Shearwater	REKN	Red Knot
CACG	Cackling Goose	REPH	Red Phalarope
CAGU	California Gull	RBME	Red-breasted Merganser
CANG	Canada Goose	REDH	Redhead
CANV	Canvasback	RNGR	Red-necked Grebe
CATE	Caspian Tern	RNPH	Red-necked Phalarope
CAAU	Cassin's Auklet	RSHA	Red-shouldered Hawk
CITE	Cinnamon Teal	RTHA	Red-tailed Hawk
COGO	Common Goldeneye	RTLO	Red-throated Loon
COLO	Common Loon	RHAU	Rhinoceros Auklet
COME	Common Merganser	RBGU	Ring-billed Gull
COMU	Common Murre	RNDU	Ring-necked Duck
CORA	Common Raven	RLHA	Rough-legged Hawk
COTE	Common Tern	RUDU	Ruddy Duck
DCCO	Double-crested Cormorant	RUTU	Ruddy Turnstone
DUNL	Dunlin	SAGU	Sabine's Gull
EAGR	Eared Grebe	SAND	Sanderling
ELTE	Elegant Tern	SEPL	Semipalmated Plover
EUWI	Eurasian Wigeon	SESA	Semipalmated Sandpiper
FFSH	Flesh-footed Shearwater	SSHA	Sharp-shinned Hawk
FTSP	Fork-tailed Storm-Petrel	SBDO	Short-billed Dowitcher
GADW	Gadwall	STTS	Short-tailed Shearwater
GLGU	Glaucous Gull	SNGO	Snow Goose
GWGU	Glaucous-winged Gull	SNPL	Snowy Plover
GBHE	Great Blue Heron	SOSA	Solitary Sandpiper
GREG	Great Egret	SOSH	Sooty Shearwater
GRSC	Greater Scaup	SPSK	South Polar Skua
GWFG	Greater White-fronted Goose	SPSA	Spotted Sandpiper
GRYE	Greater Yellowlegs	SUSC	Surf Scoter
AGWT	American Green-winged Teal	SURF	Surfbird
HADU	Harlequin Duck	ICGU	Iceland (Thayer's) Gull
HEEG	Heermann's Gull	TRUS	Trumpeter Swan
HERG	Herring Gull	TUPU	Tufted Puffin
HOME	Hooded Merganser	TUSW	Tundra Swan
HOGH	Horned Grebe	WATA	Wandering Tattler
KILL	Killdeer	WEGR	Western Grebe
LAAL	Laysan Albatross	WEGU	Western Gull
LESP	Leach's Storm-Petrel	WESA	Western Sandpiper
LESA	Least Sandpiper	WHIM	Whimbrel
LESC	Lesser Scaup	WWSC	White-winged Scoter
LEYE	Lesser Yellowlegs	WILL	Willet
LBCU	Long-billed Curlew	WISN	Wilson's Snipe
LBDO	Long-billed Dowitcher	WODO	Wood Duck