



BC Coastal Waterbird Survey: Training Module for Volunteers



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Service

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de la faune



Background

- The BC Coastal Waterbird Survey (BCCWS) is a volunteer based long-term monitoring program established in 1999.
- Goal: to assess the impacts of natural and human-induced environmental change on BC's waterbird populations.
- Data collected is used to estimate population size and to assess population trends and distribution of coastal waterbirds in BC.



Why Monitor?



Threats to Coastal Waterbirds in BC

- Habitat loss
- Oil spills
- Fishery Bycatch
- Water pollution
- Disturbance (boats, dogs, predators)
- Climate change

Objectives

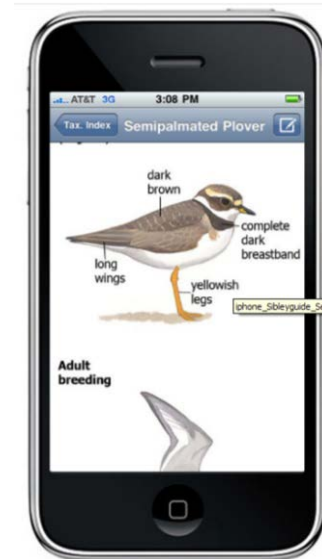
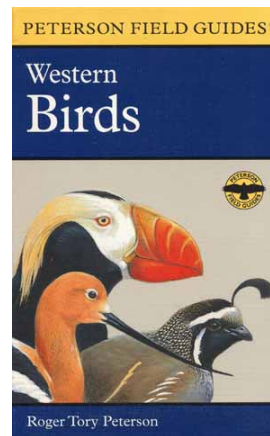
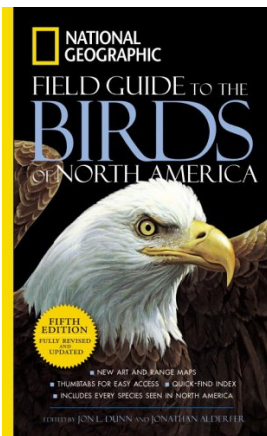
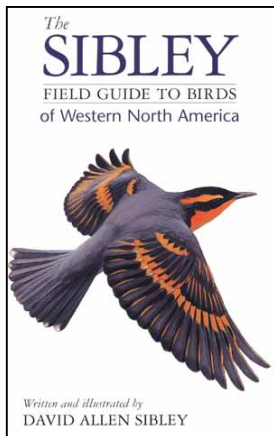
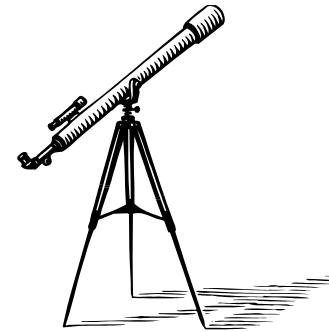


- Collect data to estimate population numbers of coastal waterbird species in BC.
- Assess annual changes and long-term trends in population size and distribution of coastal waterbirds in BC.
- Assess and monitor the importance of individual sites for waterbirds.
- Improve our understanding of the ecology of waterbirds in BC, including responses to natural and human-induced change (e.g., habitat alteration).

Monitoring Birds: Identification

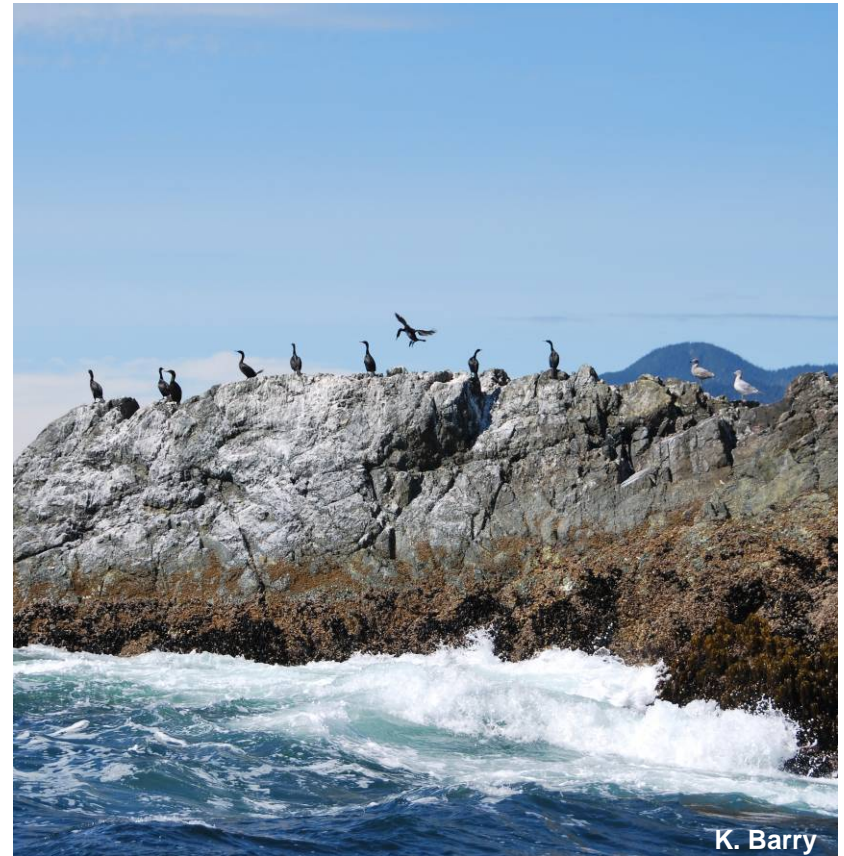
Volunteers should have:

- High quality optical equipment
- Advanced bird identification skills
(or be accompanied by an experienced birder)



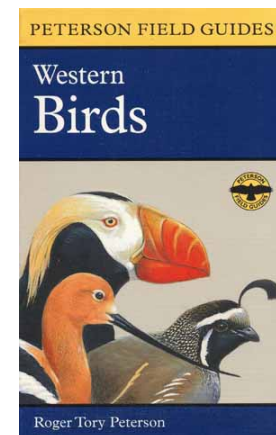
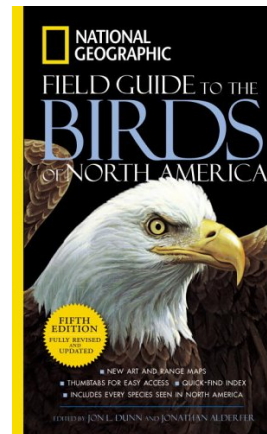
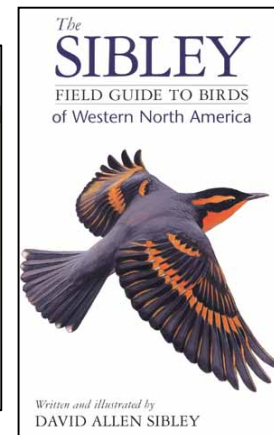
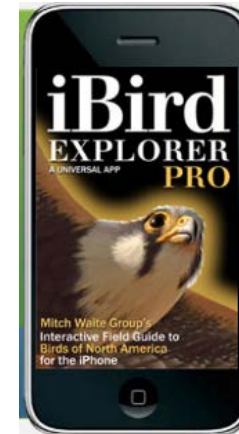
Waterbirds: Most Common Groups

- Loons
- Grebes
- Pelicans
- Cormorants
- Herons
- Swans & Geese
- Dabbling Ducks
- Diving Ducks
- Shorebirds – plovers, sandpipers
- Gulls & Terns
- Alcids – puffins, murrelets, murres



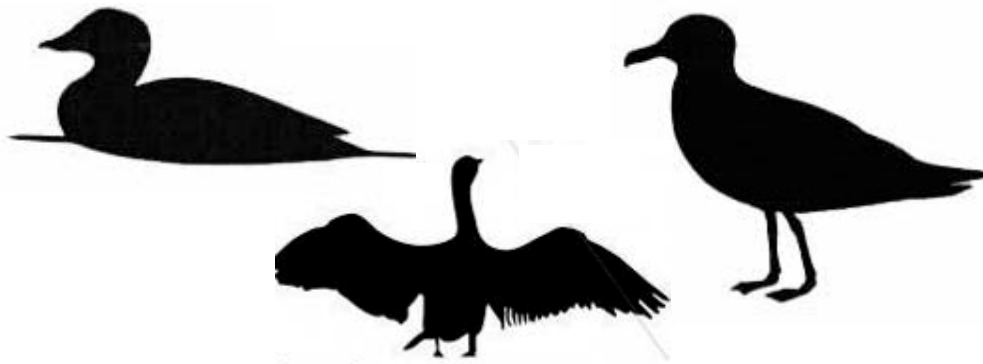
Bird Identification Resources

- Field guidebooks: Sibley, National Geographic, Peterson
- E-guides/ Smartphone apps: ibird, Sibley, Audubon, Peterson
- [Dendroica](http://www.natureinstruct.org/dendroica/): <http://www.natureinstruct.org/dendroica/>
- [Ebird Canada](http://ebird.org/canada): <http://ebird.org/canada>
- [Cornell Lab](http://www.allaboutbirds.org): www.allaboutbirds.org
- [Whatbird](http://www.whatbird.com): www.whatbird.com



Identification Overview

- Look at **silhouette** & **behaviour** to identify group
- Learn shape differences when birds are **sitting versus flying**
- Look for **key features**: head, bill, body colour, other
- Consider the **habitat**: estuaries, freshwater, rocky shores
- Consider the **season**: breeding and migration patterns
- **Use caution**: if uncertain, record as “Unknown”
- If possible, take photographs of the bird for verification



Surf Scoter:

White patch on forehead and nape. Large bill patterned with white, red, yellow and a black; upper part swollen at base.

Survey Design

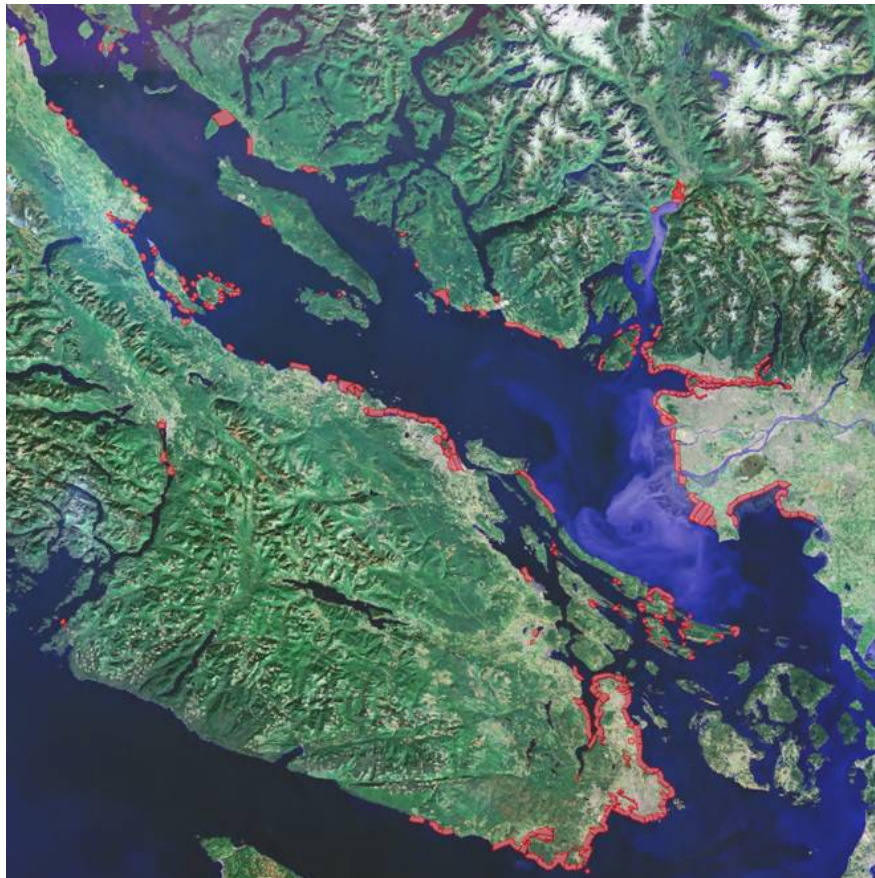
- Survey participants conduct monthly counts of waterbirds at a designated survey site with an emphasis on the winter period from September to April.



K. Barry

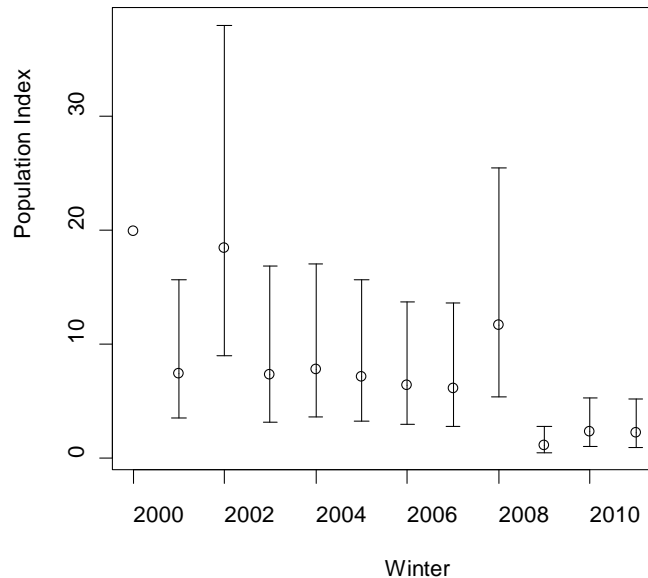
Survey Site Locations

- 387 sites have been surveyed since 1999, and over 200 are actively monitored.



What are the Data Used For?

- Determine population trends: declining & increasing species.
- Understand patterns in distribution and abundance: seasonal, annual.
- Identify important habitats.

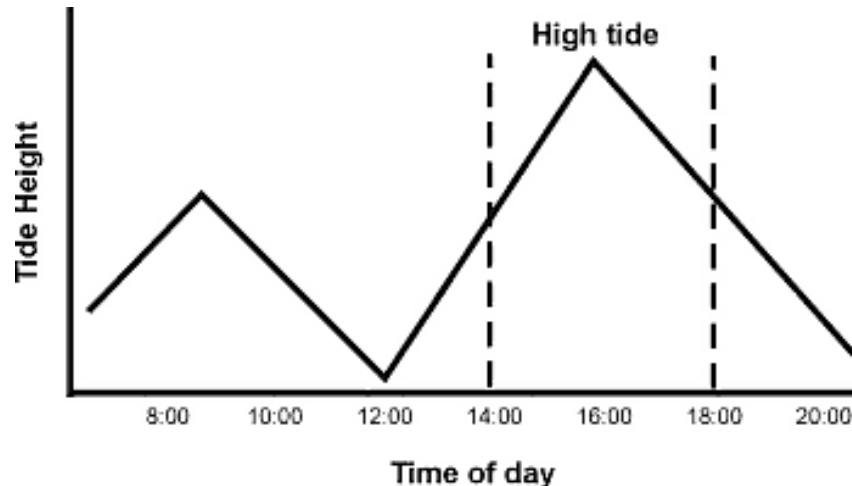


Western Grebe Population Index from winter 2000 to 2010



When to Survey?

- **Timing:** Second Sunday of each month (or within 2-3 days of the second Sunday)
- **Tide:** Within 2 hours of high tide



The high tide of the day in this example is at 16:00 (4:00 PM). Therefore the best time to count waterbirds is from 14:00 to 18:00 (between 2:00 and 6:00 PM).

You can check tides using the interactive map and tide predictor on the Canadian Hydrographic Services website:

www.waterlevels.gc.ca/eng

How to Survey?

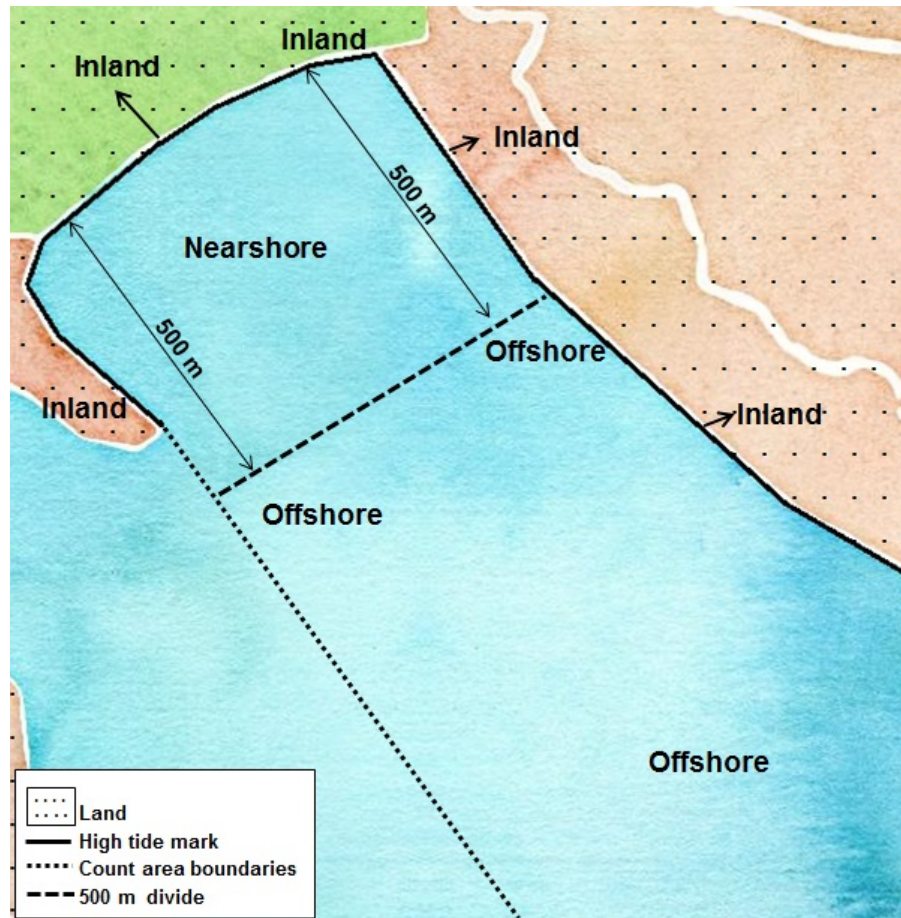
- Total counts of each species within the count area. Record all waterbirds by habitat category.
 - **Inland:** Birds located above the highest high water mark; for example, birds in fields or on inland ponds. Do not include landbirds or forest birds in your count.
 - **Nearshore:** Birds located from the highest high tide mark on the beach seaward to 500m from shore.
 - **Offshore:** Birds located from 500m off-shore to as far as you can see.



No Fly-bys! Birds that are flying through your site and do not land should not be counted.

How to Survey?

Habitat Categories



Inland: Above the highest high water mark on the beach.

Nearshore: From the highest high tide mark seaward to 500m from shore.

Offshore: From 500m off-shore to as far as you can see.

How to Survey?

- Counting waterbirds at your survey site
 - Walking along shorelines or mudflats: Bird counts should be broken up into sections using landmarks along the shoreline (e.g., tree, access point, roads). Walk along the shoreline stopping to count each section. The off-shore habitat begins at 500m from the shoreline.



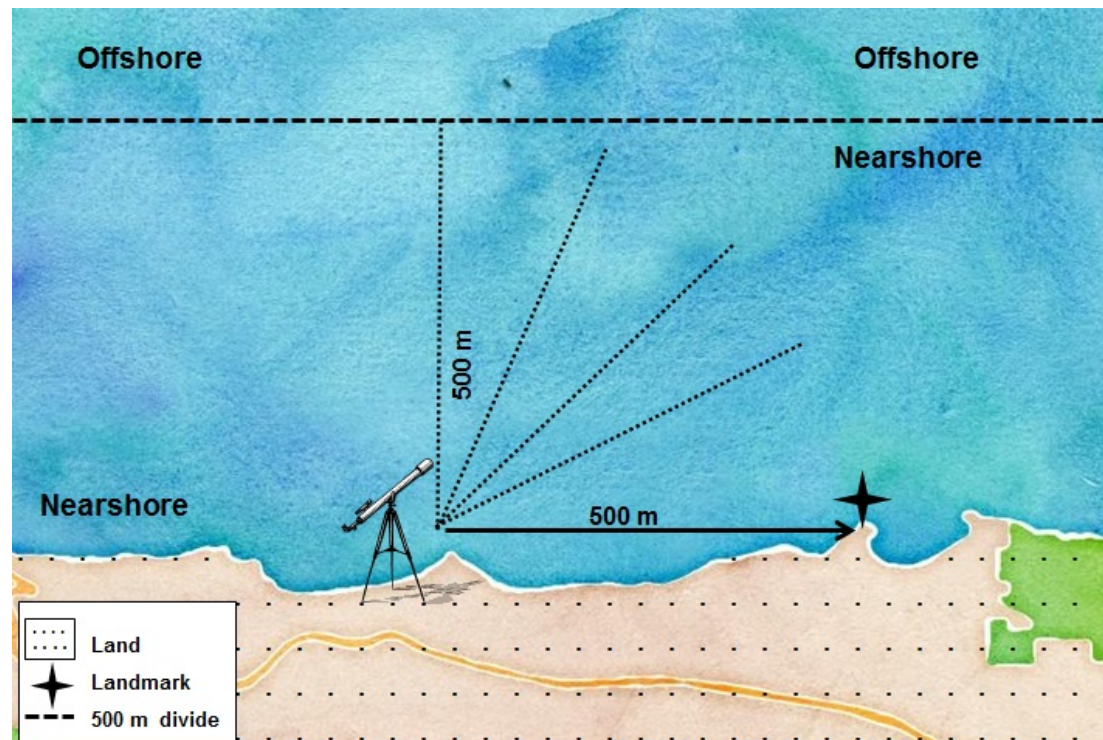
How to Survey?

- Estimating Distances- Getting a feel for 500m
 - Pacing out 500m on the beach: Count your steps to walk 500m distance along the shoreline and use that as your future 500m estimate. The average person walks approximately 1 meter with every 2 steps, therefore to pace 500m you need to walk 1000 casual steps.



How to Survey?

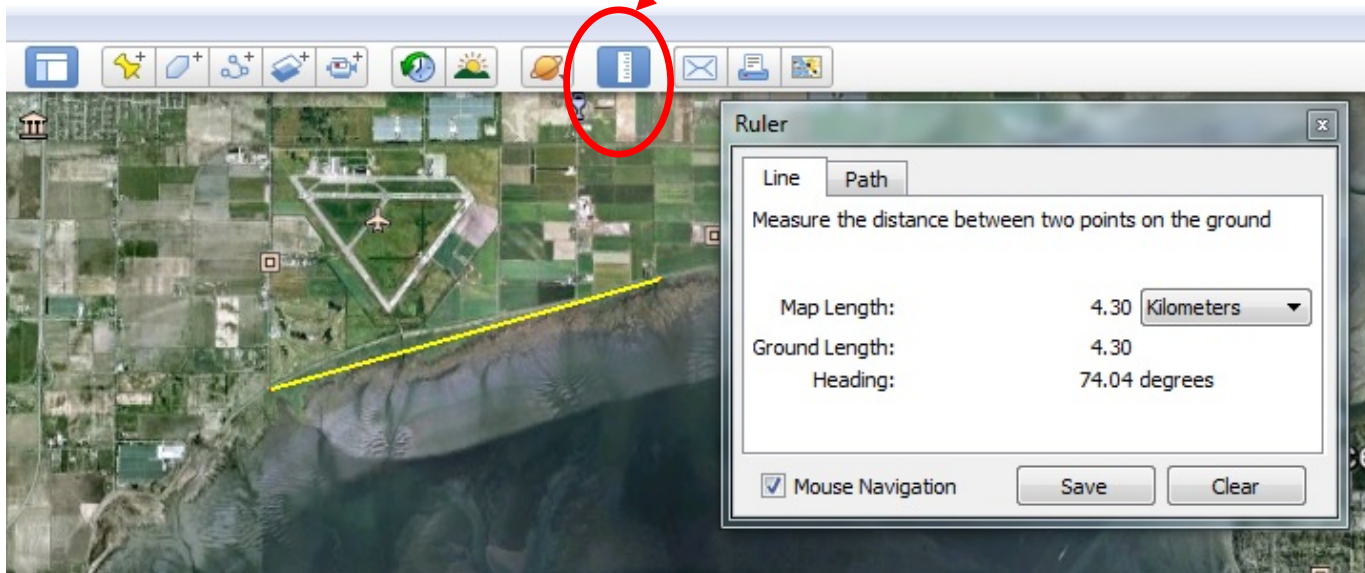
- Estimating Distances- Getting a feel for 500m
 - Using a permanent Marker: You can use a permanent marker as a consistent 500m distance estimate. You can use an imaginary radius from the permanent marker to denote a ~500m distance from the shoreline.



How to Survey?

- Estimating Distances- Getting a feel for 500m
 - Using Google Earth measuring tool: Zoom into your survey site on Google Earth and click on the Measuring Tool (icon looks like a small ruler). Click on the start point and then click on the end point and it will give you a straight-line distance in a small window.

Click here.
Measuring tool
icon.



The Data Form



FIELD DATASHEET



OBSERVER		ADDITIONAL OBSERVER(S)			
Name: _____ Code: _____		Name: _____		Code (if known): _____	
Address: _____		e-mail: _____		Tel: _____	
SURVEY SITE		REGION	NUMBER		
Name: _____		Survey Site Code: _____		_____	
Date (YYYY/MM/DD): _____		Start Time: _____		Finish Time: _____	
SURVEY CONDITIONS (please circle the appropriate description)					
Weather	Clear	Partly-cloudy	Overcast	Fog	
Precipitation	Rain	Snow	Rain & Snow	None	
Sea State	Calm	Rippled	Choppy	Wavy	Rough
Tide State	High-tide	Mid-tide	Low-tide	Mid-High	Mid-Low
Tide Movement	Rising	Falling	Rising & Falling	Slack	
VISIBILITY How far were you able to see and identify waterbirds clearly? (check one)					
<input type="checkbox"/> <100m <input type="checkbox"/> 100m <input type="checkbox"/> 250m <input type="checkbox"/> 500m <input type="checkbox"/> 1km					
If visibility was poor, what was the reason? <input type="checkbox"/> Glare <input type="checkbox"/> Sea-conditions <input type="checkbox"/> Weather Other: _____					
SURVEY EQUIPMENT (circle one)					
			Binoculars-only	Spotting Scope	
HUMAN ACTIVITY Please give approx. numbers of shoreline users observed during the survey, or check 'No Activity'					
<input type="checkbox"/> No Activity Walkers _____ Dogs _____ Powered boats _____ Unpowered boats _____ Other (specify): _____ (active with engines) (e.g. kayaks)					
COMMENTS & ADDITIONAL INFORMATION					

- **Observer:** Complete all fields.
- **Survey Site:** Complete all fields. Use the 24-hour clock to record Start and Finish Time (i.e. 3 pm = 1500).
- **Survey Conditions:** Circle only the appropriate description for each condition.
- **Visibility:** Check one. If you did not have good visibility select the reason (Glare, sea-conditions, weather, other).
- **Human activity:** Please do not leave blank spaces; if you did not find any human activity check "No Activity".

The Data Form

Loons & Grebes		IN	NS	OS	UH	Raptors		IN	NS	OS	UH
Red-throated Loon	R1LO					Bald Eagle	BABA				
Pacific Loon	PALO					Northern Harrier	NOIA				
Common Loon	COLO					Red-tailed Hawk	RTHA				
unidentified loon sp	UNLO					Merlin	MEKL				
Pied-billed Grebe	PBGR					Peregrine Falcon	PEFA				
Horned Grebe	HOGR					unidentified falcon	UNFA				
Red-necked Grebe	RNGR										
Western Grebe	WEGR										
unidentified grebe	UNGR										
						Coots					
						American Coot	AMCO				
						Shorebirds					
Cormorants						Black bellied Plover	BBPL				
Brandt's Cormorant	BRAC					Killdeer	KILI				
Double-cr. Cormorant	DCCO					Black Oystercatcher	BLOY				
Pelagic Cormorant	PECO					Greater Yellowlegs	GRYE				
unid. cormorant sp	UNCO					Black Turnstone	BLTU				
Hérons						Surf Scoter	SURF				
Great Blue Heron	GBHE					Sanderling	SAND				
						Western Sandpiper	WESA				
						Dunlin	DUNL				
Swans & Geese											
Snow Goose	SNGO										
Canada Goose	CAGU										
Drant	DRAN										
Mute Swan	MUSW					Gulls & Terns					
Trumpeter Swan	TRUS					Bonaparte's Gull	BOGU				
						Herring Gull	HEEG				
						Mew Gull	MEGU				
Ducks						Ring-billed Gull	RBGU				
Gadwall	GADW					California Gull	CACU				
Eurasian Wigeon	EUWI					Herring Gull	HFRG				
American Wigeon	AMWI					Thayer's Gull	THGU				
Mallard	MALL					Western Gull	WEGU				
Northern Shoveler	NSHO					Glaucous-winged Gull	GWGI				
Northern Pintail	NOPI					Glaucous-w. hybrid	GWGH				
Green-winged Teal	GWTE					unidentified gull sp	UNCU				
Croaker Scaup	CRSC					Caspian Tern	CATE				
Lesser Scaup	LESC										
unidentified scaup sp	USCA										
Harlequin Duck	HARD										
Surf Scoter	SUSC										
White-winged Scoter	WWSC					Alcids					
Black Scoter	BLSC					Common Murre	COMU				
unidentified scoter sp	UNSC					Pigeon Guillemot	PIGU				
Long-tailed Duck	LTDU					Marbled Murrelet	MAMU				
Bufflehead	BUFF					Rhinoceros Auklet	RHAU				
Common Goldeneye	COGU					unidentified alcid sp	UNAL				
Barnow's Goldeneye	BAGO										
unid Goldeneye sp	UNGF										
Hooded Merganser	HOMG					Other species					
Common Merganser	COMG					Belted Kingfisher	BEKI				
Red-br. Merganser	RBME					Northwestern Crow	NOCR				
unidentified duck sp	UNDU					Common Raven	CORA				



- Record the total number of birds by species in each habitat category.
- Avoid using the unknown habitat column "UH".

Enter the total number of each species counted: IN = habitats inland from the shoreline; NS = from the shoreline to 500m out from the hi-tide mark; OS = beyond 500m out from the hi-tide line; UN = Unknown habitat – please give explanation in Comments box.

Online Data Entry

- When you join the survey, the Program Coordinator will provide you with an Observer Code and Password.
- Data can be entered online from the Bird Studies Canada Website, under the [Coastal Waterbird Survey webpage](http://www.bsc-eoc.org/dataentry/bccwsentry.jsp): www.bsc-eoc.org/dataentry/bccwsentry.jsp

Bird Studies Canada's

 **British Columbia**
Coastal Waterbird Survey Data Entry 

**Welcome to the B.C. Coastal Waterbird Survey
Data entry page**

You must log in with your observer code and password (initially your postal code, including the space) in order to submit data over the Internet. If you are not already registered, or if you have any questions, you can contact Peter Davidson pdavidson@bsc-eoc.org or go the [BC Coastal Waterbirds Survey web page](http://www.bsc-eoc.org/dataentry/bccwsentry.jsp) for more information. If you forgot your observer code and/or your password and you provided an email address when you registered, you can request an email reminder by entering your observer code OR your email address below (your login information will be emailed to you automatically).

Please enter your observer code:

Please enter your password:

Email reminder (enter your observer code or email address):

Remember

Be consistent!

- Always count within the same area. Use permanent landmarks as reference points.
- Resist temptation to include interesting species outside the site boundary!
- Ensure your count is within two hours of high tide
- Exercise caution with identification. If unsure, identify to nearest taxon, e.g. unidentified scoter – UNSC
- Long-term coverage by same observer(s) is ideal because it reduces observer bias



K. Barry

Counting Waterbirds: Easier Said than Done?



Herring spawn season in Baynes Sound.



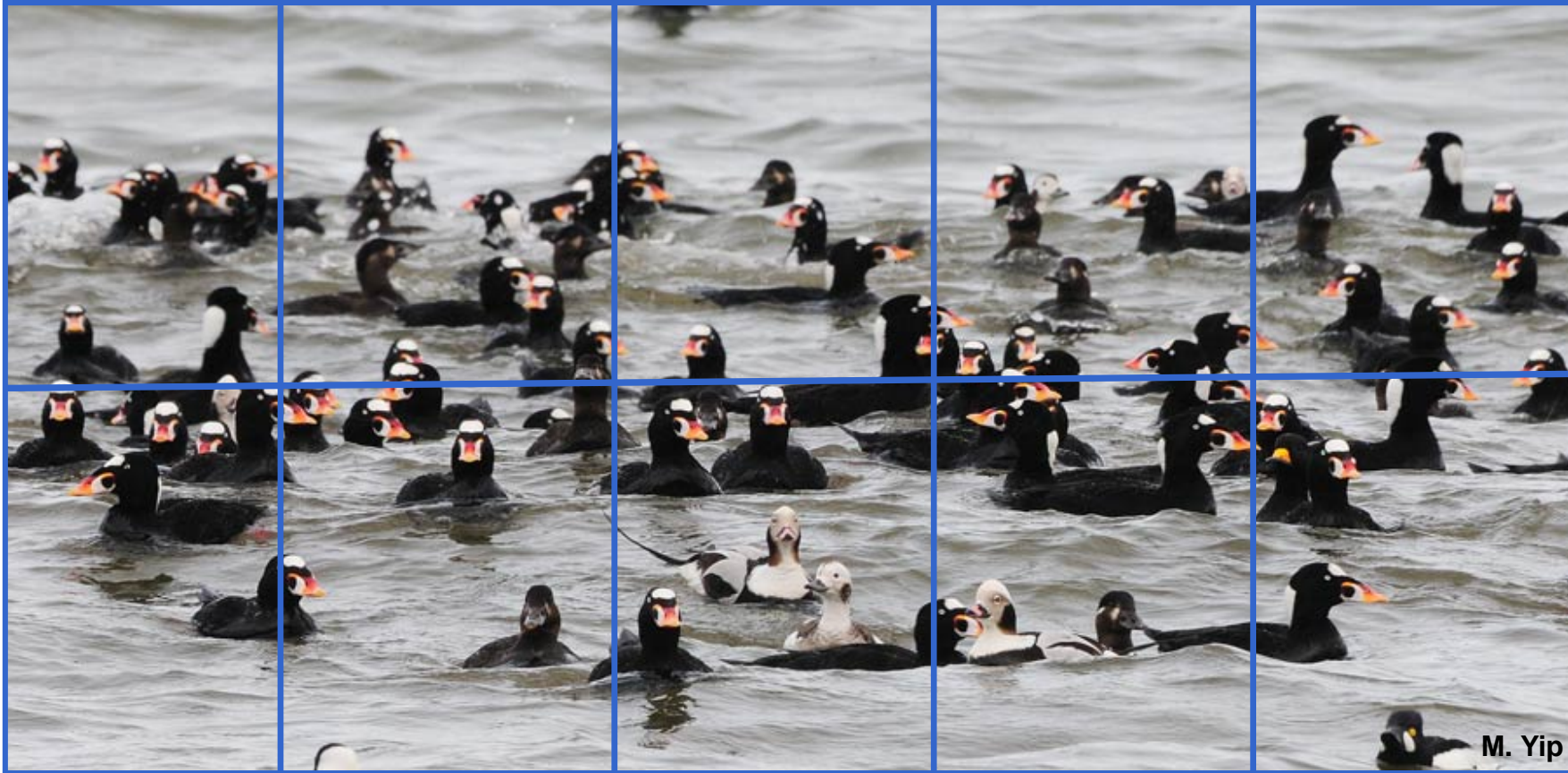
Counting Techniques

- Assess flock size & species composition:
 - How many birds? How many species? Look for any unusual or rare species.
 - Is the flock dense or well spaced out?
 - Are the birds actively diving, flying, is there a predator around spooking them (e.g., Peregrine Falcon).
- Can you count them easily by individual bird?
 - If not, estimate using appropriate sub-group classes
- If multiple species, estimate composition along transects



Counting Techniques

Species composition?



How many species? How many individuals?

Counting Techniques

Species composition?



71 Surf Scoter, 6 Long-tailed Duck, 1 Barrow's Goldeneye, 1 Black Scoter
95% Surf Scoter, 4% Long-tailed Duck, 1% other

Counting Techniques

- When there are too many birds in a flock to count them individually:
 - Separate birds into smaller groups depending on the size of the flock e.g., 10s, 50s, 100s or 500s and extrapolate through the rest of the flock. For example: count the first ten birds in the flock, get a sense for what proportion of the flock they take up, and then extrapolate by tens through the rest of the flock.



Counting Techniques



There are 10 birds in the yellow box. How many birds are there in the flock?

Counting Techniques



There are 68 birds in this flock!

Counting Techniques



- Another option for a confined area (lake, fenced field): count how many birds cover roughly 10% of the area and multiply by ten.
- Recount several times to check.
- **Estimating is OK but don't count what you can't see!**

Counting Techniques

- A large flock of shorebirds



M. Lemon

Note how the size of your count-estimate frame decreases with distance.

Estimating flocks of many thousand is usually best done in sub-groups of 500-1,000. There's probably ~2,000 birds in this picture. **Estimate the species composition** by counting the number of each species along a series of transects through the flock, like on the left side of this picture, which results in ~60 Dunlin to ~20 Westerns. Imagine this magnified 100 times, and that is the spectacle of the peak in the spring Western Sandpiper migration.

Online Resources and Tips

- [Ebird](#)
 - For bird counting tips and techniques for counting single-species flocks see [Bird Counting 101](#)
 - For guidance for counting large numbers, moving flocks, and mixed species flocks see [Bird Counting 201](#)



- Practice with an experienced person, it gets easier!
- Start with smaller, easier flocks and progress to larger groups.
- Take photos to try to calibrate your eye.
- Have fun!

Review Quiz:

Are you ready for your survey?



Test yourself by answering the following 12 questions



If you are not clear on the reason for any answer,
please contact the Program Coordinator at
BCprograms@birdscanada.org

Thank you for your interest and participation!

Review Quiz:

Are you ready for your survey?



1. BC Coastal Waterbird Surveys should be conducted:
 - a) The first Sunday of each month.
 - b) The second Sunday of each month.
 - c) As close to the designated date as possible; preferable within 1 or 2 days of the designated date.
 - d) Close to the designated date; 5 or 10 days from the designated date is ok.
 - e) b and c.

2. The high tide for the day of your monthly survey is at 13:00 (1:00 PM). The best time to conduct your survey is:
 - a) From 11:00 to 15:00
 - b) Any time before 11:00
 - c) Any time after 15:00
 - d) Anytime but 13:00. You should not conduct your survey at high tide

Review Quiz:

Are you ready for your survey?



3. The tide is rising and there is a Glaucous-winged Gull walking on the beach below the highest tide mark. The correct habitat for this bird is:
 - a) Nearshore
 - b) Inland
 - c) Offshore
 - d) Unknown

4. A flock of 20 Canada Geese fly right over your count area 50m from the shore and land outside the boundaries of your count area. What should you do:
 - a) They flew within 500m from the shore and should be recorded in the Inshore habitat category.
 - b) They landed out of the count area and should be recorded in the Offshore habitat category.
 - c) They should be recorded in the Unknown habitat category because they are outside of the count area boundaries.
 - d) They fly over (flybys) and landed outside of the count area; they should not be recorded.

Review Quiz:

Are you ready for your survey?



5. A Double-crested Cormorant is feeding in the Offshore habitat but flies and perches in an small island 200m from the shore. The correct habitat category for this bird is:
 - a) Offshore habitat. It was originally there.
 - b) Inland habitat because it landed on an island.
 - c) Nearshore habitat. Birds should be recorded in the habitat closest to shore.
 - d) Nearshore habitat because the island is located within 500 m from the shore.
 - e) c and d

6. You arrive at your standard viewpoint but access to the beach is blocked by large logs and slippery seaweed. You should:
 - a) Try scrambling over the logs even though you are not comfortable doing this.
 - b) Look for another safer way to access the beach.
 - c) Postpone your survey if you cannot find a safe way to access the beach.
 - d) b and c.

Review Quiz:

Are you ready for your survey?



7. A Mallard is swimming in the ocean 800m from the highest high tide mark but flies to a small inland pond 30m above the high water mark. This bird should be recorded in:
 - a) Offshore habitat. It was originally there.
 - b) Inland habitat because it moved to an inland pond.
 - c) Nearshore habitat because it is in an aquatic habitat near the shore.
 - d) Unknown habitat.

8. There is a severe southeast storm on the Second Sunday of the month when you had planned to conduct your survey. The weather forecast is better over the next few days. You should:
 - a) Cancel your survey this month even though you are available.
 - b) Do the survey during the storm even though visibility is very poor and you can't see the birds to identify them.
 - c) Try to reschedule for the soonest day after the storm has blown through and visibility has improved.
 - d) Reschedule your survey for the following Sunday because the survey can only be done on Sundays.

Review Quiz:

Are you ready for your survey?



9. Volunteers who are interested to participate in the BC Coastal Waterbird Survey should have:
- a) A very expensive camera with high power zoom lens
 - b) Advanced bird identification skills.
 - c) Binoculars and ideally a spotting scope.
 - d) A recording notebook or data form.
 - e) b, c, and d
10. A flock of 30 Surf Scoter are diving 600m from the shore but 10 fly away and leave your count area. You should:
- a) Don't record these birds in your count because some left the survey area.
 - b) Record 30 Surf Scoter in the Offshore habitat category because they were seen using that habitat.
 - c) Record 20 in the Offshore habitat category and 10 in Unknown habitat.
 - d) None of the above.

Review Quiz:

Are you ready for your survey?



11. During your survey a gull has been flying 300m from the shore in the survey area and actively foraging. You should record this bird:
- a) In the Nearshore habitat category because it has been using the habitat actively.
 - b) It is flying and flying birds should not be included in the count.
 - c) In the Unknown habitat because it never landed.
 - d) You should not record birds that you cannot identify to the species level.
12. During your survey, you see 3 motorboats, 5 walkers and 2 dogs in your count area. You should:
- a) Don't bother to record this information.
 - b) Record the total of each category and enter it online in the Human Activity section.
 - c) Add up all the recreational users and record one total number.
 - d) None of the above

Answer Key



1. e) b and c.
2. a) From 11:00 to 15:00
3. a) Nearshore
4. d) They fly over (flybys) and landed outside of the count area; they should not be recorded.
5. e) c and d
6. d) b and c.
7. b) Inland habitat because it moved to an inland pond.
8. c) Try to reschedule for the soonest day after the storm has blown through and visibility has improved.
9. e) b, c, and d
10. b) Record 30 in the Offshore habitat category because they were seen using that habitat.
11. a) In the Nearshore habitat category because it has been using the habitat actively.
12. b) Record the total of each category and enter it online in the Human Activity section.