Assessing Blackfoot Wetlands

Objectives

Student will learn which habitat characteristics are important to swans. They will learn how biologists analyze data to determine if a wetland is suitable for swan reintroduction and swan nesting. They will learn how some wetlands in the Blackfoot Valley meet these suitability criteria.

Method

Students use data from the Blackfoot Valley Wetland Habitat Suitability Data to analyze individual wetlands. They summarize their findings and give an assessment on whether the wetlands are suitable for nesting and whether they would recommend them as release sites. They can then compare them to the decisions the biologists made about each wetland.

Materials

Each student will need access to:

- o Background and Procedures handout
- o Swan Habitat Criteria List
- o Blackfoot Valley Wetland Habitat Suitability Data
- o Wetlands Summary Chart

NOTE! All of these are provided in the STUDENT PAGES document! They are also provided at the end of this document for your convenience.

Background Information

Trumpeter Swans inhabit lakes, ponds, large rivers, and coastal bays that have shallow wetland areas. Their most important habitat requirements are open water with adequate room to take off (approximately 100 meters), access to food (mostly aquatic vegetation), shallow, stable levels of unpolluted fresh water, a muskrat house, island, or other structure for the nest site, appropriate plant species for building nests, and low human disturbance.

Trumpeter Swans forage in water and, especially in winter, on land. Plant material makes up most of their diet. Adults eat stems, leaves, and roots of aquatic plants, switching to upland grasses and waste grain in the winter. Newly hatched cygnets feed mainly on aquatic insects and crustaceans

Nests are usually located near shore, on small islands, on muskrat and beaver lodges, or on floating vegetation. The nest is a low mound of plant matter several feet across, with a depression in the middle. It is

Grade level: 5-8

Subject Areas: Biology, math, writing

Duration: 30-60 minutes

Topics: Habitat use, writing skills, chart reading, data analysis

National/Montana Science Standards: A, C, E / 1, 3

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usually made of cattails, sedges, and/or rushes. The nest may be reused from year to year.

To identify the best sites for swan reintroduction in the Blackfoot, as well as to assess whether there is even enough appropriate habitat to support a population of swans, 71 wetlands in the upper Blackfoot Valley were surveyed in 2004. Data on the wetland characteristics deemed most important to swans (see Swan Habitat Criteria List) were collected and analyzed, and each wetland was assessed as both a release site and as potential nesting habitat.

Out of the 71 sites surveyed, 27 were determined to be suitable for nesting, and 9 of these were selected for release sites. Hazards that existed at the time of the survey at some of these 9 sites were mitigated (e.g., fences moved or removed) before release.

You can either provide your students with the Background/Procedure handout, or go over them together if you are doing an online presentation.

After they have completed their analysis and filled out the summary chart, if your communications allow you can facilitate a class discussion on their results. You can use the following questions for discussion or come up with your own:

    a. Did you have enough information to make a solid conclusion? If not, what more would you like to know?

    b. Did you consider some characteristics more important than others? Which ones?

    c. Do you think any wetland surveyed will be "perfect" for swan release and/or nesting? Why or why not?

    d. Did most of you agree on the 3 "best" sites of all the ones you analyzed to recommend for release sites? What did you base your decisions on?

You can then let them compare what they concluded with the conclusions of the biologists by handing out the **Habitat Assessment-Biologists' Summary**. They may be surprised that some sites with fences or power lines in them were chosen. Explain that if a site had very good habitat otherwise, landowners and the U.S. Fish and Wildlife Service worked together to move or remove fences to make them safer for swans, and reflective markers were hung from some power lines to make them more visible to swans.

Assessing Blackfoot Wetlands

Background Information
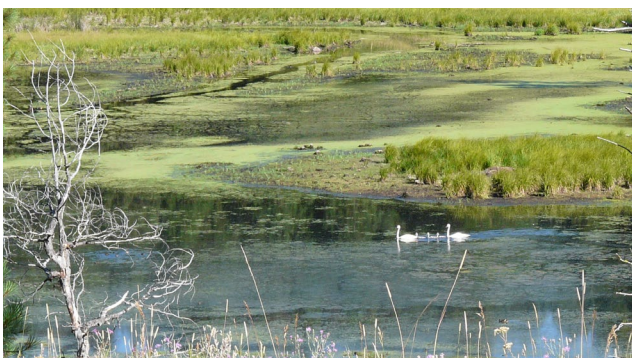
Trumpeter Swans live on lakes, ponds, large rivers, and bays that have shallow wetland areas. ***Their most important habitat requirements*** are open water with adequate room to take off (approximately 100 meters), access to food (mostly aquatic plants), shallow, stable levels of unpolluted fresh water, a muskrat house, island, or other structure for the nest site, appropriate plant species for building nests, and low human disturbance.

Trumpeter Swans forage in water and, especially in winter, on land. **Plants** make up most of their diet. Adults eat stems, leaves, and roots of aquatic plants, switching to upland grasses and waste grain in the winter. Newly hatched cygnets feed mainly on aquatic insects and crustaceans.

Nests are usually located near shore, on small islands, on muskrat and beaver lodges, or on floating vegetation. The nest is a low mound of plant matter several feet across, with a depression in the middle. It is usually made of cattails, sedges, or rushes. The nest may be reused from year to year.
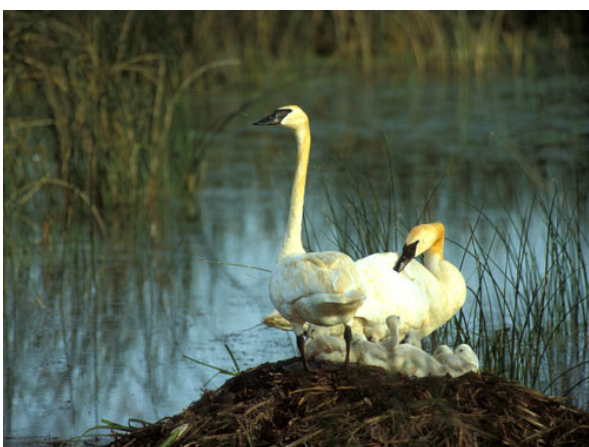
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Procedure

2. Based on the kinds of habitat Trumpeter Swans need, list at least 5 characteristics or traits of a site that would be important to measure in order to know if it is suitable habitat for swans.

        a.

        b.

        c.

        d.

        e.

3. This is exactly what biologists did in order to figure out what places in the Blackfoot would be good swan habitat, and they have used this information to select the sites for releasing swans in the reintroduction program. The **Swan Habitat Criteria List** was developed from studies of habitat that swans already use in other places. Biologists from the University of Montana and the US Fish and Wildlife Service went to 71 sites in the Blackfoot and recorded information about these site characteristics. Look through these terms and make sure you understand what they mean. If you are confused about any of them, ask your teacher for help before proceeding.

4. The **Blackfoot Valley Wetland Habitat Suitability Data** shows *some* of the actual data the biologists collected in the Blackfoot. Although 71 sites were surveyed, this shows the data for just 12 of them.

5. You now have the chance to figure whether or not these particular Blackfoot Valley wetlands would be suitable for nesting and/or appropriate release sites for swans, based on the same data the biologists used. You can use the **Criteria List** and apply it to each wetland to decide if you think it would serve as habitat for swans, and if you would recommend it as a release site. You will summarize the pros and cons for each site and record your decisions on the **Wetlands Summary Chart**.

6. After you are finished, share your recommendations for each site with your teacher and the rest of your class. Discussion might include the following:

    a. Did you have enough information to make a solid conclusion? If not, what more would you like to know?

    b. Did you consider some characteristics more important than others? Which ones?

    c. Do you think any wetland surveyed will be "perfect" for swan release and/or nesting? Why or why not?

    d. Did most of you agree on the 3 "best" sites of all the ones you analyzed to recommend for release sites? What did you base your decisions on?

Swan Habitat Criteria List

- Wetlands should be ice-free by mid-April at the latest.

- Wetland should have at least 100 meters of open water.

- Wetlands with highly irregular shorelines are preferred.

- Wetlands should be semi-permanent or permanent.

- Wetlands can be 1-400+ ha. Smaller ponds are suitable only when they are part of a larger wetland complex.

- Water should **not** be acidic, stagnant, or highly <u>eutrophic</u> (having so much plant life, such as algae, that oxygen is in short supply).

- Wetland should offer multiple potential nest sites, and at least some of these should be away from the shoreline. Potential nest sites include small to medium sized natural or man-made islands, beaver dams or houses, muskrat houses, water <1 m deep where swans can pile up aquatic vegetation, man-made floating nest platforms. Swans will also nest on shorelines but generally this is not ideal because of increased potential for predation.

- Water levels should be stable, or changes predictable (e.g. slow draw down due to evapotranspiration). Rapid changes due to flooding or draw down are not acceptable.

- Wetland should have a sufficient amount of suitable <u>submergent</u> plants (those growing completely under the water, such as pondweed, aquatic buttercup, etc.) for foraging.

- Mean water depth should be less than 1.2 meters.

- Disturbance should be minimal, or at least predictable, and should occur no closer than 100 meters to the nest site.

- Wetlands should not be crossed by fences, power lines, or other flight obstructions.

- Wetlands should be free of lead and other pollutants.

Blackfoot Valley Wetland Habitat Suitability Data

Site #	Type[1]	Size (ha)[2]	% open water	Length open water (m)	Ave. Water Depth (m)	Water pH*	Ice-off Date	Power-lines	Fences	Hunting (possible source of disturbance)	Other[3]	% with forage[4]	% with nest veg[5]	# of islands	# of beaver/ muskrat houses
26	Semi-perm	38.34	65	>152.4	0.98298	8.5	3/15-4/1	none	minor	no		75	40	4+	1
22	Perm	11.48	90	>91.44	2.286	8.0	4/1-4/15	across	minor	no	road	5	5	0	0
4	Perm	8.11	98	>152.4	1.143	10.5	4/1-4/15	adjacent	0	high	hwy	10	2	0	0
23	Semi-perm	22.05	35	91.44	0.508	8.1	3/15-4/1	none	major	no		75	50	1	5+
5	Semi-perm	14.82	60	>152.4	0.508	9.9	4/1-4/15	adjacent	0	high	hwy	50	40	1	5
42	Semi-perm	6.45	90	<15.24	0.3556	7.9	4/1-4/15	adjacent	0	low	pivot	5	10	0	0
57	Semi-perm	11.50	90	>152.4	1.4986	8.5	4/1-4/15	none	major	medium		60	10	1	1
59	Semi-perm	8.65	5	>152.4	1.50	7.0	4/1-4/15	none	0	low		45	10	0	0
29	Perm	3.83	40	>91.44	1.1684	9.3	4/1-4/15	adjacent	0	no	Hwy, houses	70	25	3	0
63	Semi-perm	2.47	90	>91.44	2.74	7.3	4/1-4/15	none	0	low	houses	50	10	1	0
55	Semi-perm	1.652	85	91.44	1.524	10.3	3/15-4/1	adjacent	0	no		50	15	0	0
19	Semi-perm	10.90	80	>152.4	0.4064	10.5	4/1-4/15	none	0	medium		90	20	2	0

- The pH scale ranges from 0 to 14. A pH of 7 is neutral. A pH less than 7 is acidic. A pH greater than 7 is basic.

[1]Perm= Permanent, Semi-perm=semi-permanent, Seas=Seasonal

[2] Area of wetland in hectares

[3] Other sources of disturbance, etc. are noted

[4] % of wetland with suitable submergent vegetation

[5] % of wetland with suitable emergent vegetation for nesting (sedges, rushes, and/or cattails)

Wetlands Summary Chart

Site #	Pros	Cons	Nesting Site? Y/N	Release site? Y/N
26				
22				
4				
23				
5				
42				
57				
59				
29				
63				
55				
19				

Biologists' Wetlands Summary

Site #	Pros	Cons	Nesting Site?	Release site?
26	Good submergents, pH, islands, open water, irregular coastline	Fence issues	Yes	Yes
22	Open water	Deep, very little submergents, many human disturbances	No	No
4		Basic pH, few emergents or submergents, main powerline, near highway 200	No	No
23	Good pH, depth, submergents, irregular coastline	Fence across wetland	Yes	Yes
5	Good amount of submergents, emergents, irregular coastline, islands, beaver/muskrat lodges	Basic pH, near Hwy 200	Yes	Yes
42	Pivot, channels in wetland, few submergents, powerline issues		No	No
57	Beaver dam, island, good submergents	Fence issues, deep in middle	Yes	Yes
59	Good pH, coastline, little disturbance	Deep in places	Yes	No
29	Islands, good submergents *This was the site selected by the wild swans who nested in the valley in 2003.	High levels of disturbance	Yes	Yes
63	Good submergents, irregular coastline, good pH	Very deep at center, low amount of emergents	Yes	No
55	Good emergents, open water	Basic pH, some disturbance	Yes	No
19	Good depth, islands, coastline, submergents	Basic pH	Yes	Yes