The Snow Goose Crisis: A WebQuest Example

Our sample project originated in a magazine article that described how a rapid increase in the population of snow geese was threatening the fragile ecology of Arctic tundra. The article went on to consider whether this was a situation biologists should attempt to address and, if intervention was appropriate, what possible actions might be effective. This seemed an interesting situation for a WebQuest for middle-school or high school students. Students could be asked to examine information related to the snow goose crisis and to propose what, if anything, should be done. The problem seemed complex enough that students might realistically argue for several different courses of action.

Background on the Issue

To understand the situation, students would need the following background:

Because of the extreme climate, tundra vegetation grows very slowly. Geese use the tundra as a breeding ground, and the parents and young rip plants out by the roots as they feed around the nesting areas. Once an area has been destroyed in this manner, neither geese, other wildlife that feed on the vegetation, nor animals that feed on the plant eaters will be able to inhabit the area for many years. There is a very real threat of a population crash in which many birds and animals will die from malnutrition and related diseases.

One of the most basic issues in such a situation is whether humans should intervene to alter a process of nature. Noninterventionists argue that nature will find a solution even though the process may be harsh. In contrast, biologists favoring active management of natural resources assume that intervention can avoid extreme swings in populations. Those favoring
intervention also argue that some of the causes for the present situation are the result of human actions. These human causes include change in farming practices that have a great deal of waste grain on the ground following harvest, making it easy for birds to feed during the fall and winter; and the development of a system of protected areas that allow geese to avoid hunters and predators during the fall and spring migrations.

If biologists choose to intervene, there are many possible, but untested, approaches. One interesting question is whether economic benefits should be considered. For example, a solution that extends the hunting season and increases the bag limit (the number of birds that can be shot each day) may attract more hunters and money to certain areas of the United States and Canada. Reducing food and habitat in areas in which geese overwinter would also reduce the population, but with no economic benefits. There is also the matter of expense and who pays for the intervention (taxpayers, nature lovers, hunters). Finally, there is a question of personal values regarding such issues as intervention and killing wildlife for sport.

**Instructional Tasks**

A major part of creating a structured inquiry task of this type is locating task-appropriate Internet resources. The teacher takes responsibility for this job. But why not just make the assignment, you may ask, and allow students to find their own resources?

Assume that you are developing this activity for middle school students. Students familiar with web searching might reasonably conduct a search on the phrase "snow goose." We did our own search of this type, and we received over 4,200 hits. Listed among the first four sites were the titles "Snow Goose with White Wine," "Snow Goose Hunting in Nebraska," and "Snow Goose Inn." Yet, you may say, but why not use Boolean search techniques as described in Chapter 4? A search on the Boolean expression "snow goose" +population returned 427 hits, and a search on "snow goose" +cristi returned 115 hits. Even if middle school students were experienced enough to generate these Boolean searches, the amount of material to examine would be formidable and would require a great amount of their time. Thus, while students do need to learn to conduct their own web searches, you might decide in this case to locate web resources in advance so that your students could concentrate on the problem-solving process. You might also want to locate task-appropriate web resources simply to save the students' time.

In general, WebQuests are described as "scaffolded" because the teacher assists the student in ways that allow the student to address challenging
problems with an acceptable level of effort and a reasonable opportunity for success. This is particularly important for younger students. As a teacher, you can set the stage for your students, allowing them to focus on key issues and encouraging them in their critical thinking and problem-solving.

The WebQuest Presentation

Figure 5.3 provides two sample screens from a WebQuest developed with the multimedia authoring tool HyperStudio. The first screen image—Figure 5.5 (a)—shows the WebQuest introduction, which is intended to establish a background for the activity and generate student interest. The photograph shows the devastation caused by the feeding habits of snow geese (note the difference between the fenced and the unfenced areas).

The second screen image provides an example of how students might be prompted to explore a particular web resource for a certain type of informa-

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**FIGURE 5.3** Sample screen images for a WebQuest, developed in HyperStudio. (a) The WebQuest introductory screen. (b) A second screen that directs students to a particular web site (via the "click to open" icon) and guides them to find certain information at that site.
As you can see from Figure 5.3 (b), HyperStudio has a very useful feature that allows a button (the world icon in this case) to launch a browser and send the user to a designated URL. In this instance, the user is encouraged to examine the information found at that website and to record on the HyperStudio "card" (the bottom portion of the screen) several possible reasons for the rapid increase in the snow goose population.

Although WebQuests direct students to consider specific information at specific sites, they may also provide links to other Web sites that students can explore without such detailed guidance. Students can use all the information they accumulate, and they can return to the web resources as needed while they complete the activity.

Figure 5.4 shows a similar version of the WebQuest presented as a WWW page. Here you can see the four typical components we identified earlier: (a) introduction, (b) task or activity, (c) annotated primary sources, and (d) secondary sources. Some WebQuests provide multiple tasks and offer students a choice. Tasks can take a wide variety of formats, but we would urge more frequent use of tasks that emphasize decision making, problem solving, and information integration rather than mere fact reporting.
Too Much of a Good Thing

The population of Snow Geese has increased at a very rapid rate. Snow Geese migrate to the Arctic to nest during the summer and deny now exist in such large numbers that they are eating the plants faster than they can grow. The lack of plants threatens the survival of Snow Geese and all animals that live in this region. The basic question is what should be done. Some people believe we should allow Nature to take its course and others feel we should play a more active role. If we attempt to "manage" this problem, the question is what action or actions should be taken?

The Task

Create a HyperStudio stack to express your view of what should be done about the problem. Provide a clear explanation of what has gone wrong, propose whether or not people should intervene, and if intervention is proposed, exactly what should be done. Defend your proposal based on the factors you discover from your review of web resources.

Primary Web Resources

**North Dakota Description of Problem:** General introduction. Ideas about why population has increased. Description of problems created in the Arctic.

**Ideas for Management:** Some ideas that have been tried to control goose numbers. Some other ideas that might be tried.

**Game Parks and Recreation Description of the Snow Goose Problem.**

Secondary Resources

http://www.abc.co.uk/reading_south/moremap.htm
http://nps.nps.state.na.us/wildlife/snowgrist.html