BACK BAY SCIENCE CENTER

Bird Populations

Activity - Birds: Beaks and Feet

CALIFORNIA STATE CONTENT STANDARDS

Grades 6 – 8

6th Gr. Science:
Ecology - 5b, c, e

7th Gr Science:
Physical Principles in Living Systems - 6d
Investigation and Experimentation - 7a

Grades 9 – 12

Science:
Biology/Life Sciences - Ecology 6a, b, c

Earth Sciences - California Geology 9a, c

AP Science - Science Practices SP1.2

Life Science LS 3.2

EEI P and C: IIa; IV b, c
Ocean Literacy Principles: 1g; 6e

BACKGROUND INFORMATION

Newport Beach is located along the Pacific Flyway. Birds migrating north from South America in the Spring (as it gets colder in the Southern Hemisphere), and south from Alaska in the Fall (as it gets colder in the Northern Hemisphere), have to stop along their journey for rest and food. Wetlands supply both resources. Wetlands are used by fish as nurseries protected from the severity of the ocean environment, so birds have a ready food source. The Bay also has several resident populations that do not migrate. A few rare and endangered species can be seen here as well.

The Newport BBSC offers a wonderful opportunity to view a natural ecosystem. The plants and animals found here are particularly well-adapted to our climate, soil conditions and topography. Within the entire ecosystem are several micro-habitats that reveal the biodiversity in our area. During observations, visitors will notice that birds tend to congregate in distinct areas, each with its own food web. Some birds favor the scrub; some the mudflats; others are found along the water line; and others can be found swimming or exploring in the deeper waters. Even in a small area, a tremendous number of birds can co-exist without competition because they are adapted to hunt for different types of food!

Deeper Waters: The egrets and herons have long beaks and legs that allow

Background Information (Cont.)

them to hunt in the deeper waters. Their long beaks are strong and tapering - good for stabbing fish. Their feet have separated toes for steadier walking in the mud.

Mudflats: Birds in the mudflats must have beaks that allow them to dig through the mud. There is a wide variety of species that hunts here, and the beak sizes and shapes are highly adapted to effectively hunting out specific prey. The shorter its legs and beak, the closer to the shoreline a bird will hunt. They also have specific hunting behaviors that have been adapted to hunt particular prey. The Northern Shoveler has a broad beak that can shovel through the mud, straining out the food. Stilts, avocets, willetts, curlews and dowitchers are able to find enough food without competition because of their different beaks and leg lengths. Stilts and avocets have different beaks, and because of their size, hunt at different depths of the mud. Avocets sweep their long bills through the wet mud, and also have partially webbed feet which allow foraging in deeper waters.

Shoreline: The sanderlings are small and can be seen running quickly along the shore-line. They're actually missing the back toes on their feet – this tilts their body forward and aids momentum as they run towards the receding wave to dig in the sand, and then run away from the next incoming wave.

Swimmers: The 'swimmers' have webbed feet, which can propel them. This is a very diverse group, including gulls, terns, cormorants, teals, mallards, coots and grebes. It may seem curious that such a diversity of species can hunt for food without competition. A more careful look at the beaks of terns and gulls, for example, reveals distinct differences. The endangered California Least Tern may be seen in this area.

Hunting behaviors also differ. Some of the birds in this group dive deep into the water searching for fish (cormorants and terns) or plants, while others 'dabble' their heads just below the water surface for passing items. Several of the species, such as the Mallard, are opportunistic, with beaks that enable them to catch a wide variety of food, whatever they find.

Scrub: The 'scrub' also has a variety of niches. While the hummingbirds go after nectar, some species shuffle in the dirt for insects, others turn over leaves for larvae, while others are able to break open seeds with their broader beaks. The endangered California Gnatcatcher and Belding's Savannah Sparrow may be seen here.

Raptors: Raptors such as hawks, osprey, harriers and kestrels have a better view of their prey from above. They are commonly seen flying or on a high tree branch. Their beaks and talons are curved, sharp, and strong – for holding onto prey as they eat. The endangered Peregrine Falcon may be seen here.

Resources:
http://newportbay.org/wildlife/birds/
http://www.allaboutbirds.org/

http://www.fernbank.edu/Birding/bird_feet.htm

TEACHER GUIDE – Bird Population Module

ACTIVITY: Birds: Beaks and Feet

OBJECTIVES:

Students will be able to –

1. Demonstrate that the beak is directly related to the food a bird can successfully hunt.
2. Recognize that birds can be found in areas where their food source will be present.
3. Express that the leg is directly related to where a bird can successfully hunt.
4. Point out that the feet of a bird indicates how it hunts.
5. Identify observed behaviors in an Ethogram.
6. Use a pair of Binoculars.
7. Use a Spotting Scope.
8. Communicate a bird's location to others.

KEY TERMS:

adaptation biodiversity competition ecosystem endangered food-web micro-habitat migration mudflat niche opportunistic Pacific Flyway prey raptor resident resource scrub wetland

MATERIALS:

Binoculars for each participant
Spotting scopes
OC Bird Field Guides
Observation Worksheets