



**Western Snowy Plover**

**Educational Kit**



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## Introduction and background

### Snowy Plover Introduction

The Western snowy plover is a small, Sparrow sized, shore bird that lives along the Pacific Coast from Washington State south to Baja California. Historically snowy plovers have nested all along the coast in the dunes and sandy habitats above the ocean. Due primarily to increasing coastal development and recreational use by people the habitats they nest in have dramatically decreased and changed. Plovers are protected by the Endangered Species Act and in 2002 there were fewer than 2000 Western snowy plovers in the entire range.

#### *Plovers and People*

Plovers breed and nest from March to September when beach use by people is greatest. Their small nests are simply a scrape in the sand with three camouflaged eggs. People and pets roaming and enjoying the beach often do not notice the small plovers or their nests. Nests are easily stepped on and plovers easily disturbed while incubating eggs. Once chicks hatch a parent teaches them how to feed, since chicks cannot fly for a month after hatching we need to protect them and give them places to feed and grow. Through understanding more about habitats, bird behavior, and migration. We can learn to "share the beach" with plovers and other wildlife.

#### *Plover Natural History*

Plovers feed among the kelp and drift wood on the beach away from the waters edge. They have small tweezer-like beaks used to catch flies, and other

insects that live in the plants, kelp, and under the sand. Males and females take turns incubating eggs and feeding, they feed during the day and at night. Plovers are normally alone or in small groups, this helps to recognize them at the beach.

#### *Using this Educational Kit*

*'Grades 2-9 20 min. 115 and Up I*

A reference key is located in the upper right hand corner of each activity to provide quick information on appropriate age, group size, time required. An introduction and background section in each activity then give all the necessary information to understand the material. Necessary materials are listed for each activity along with all activity direction. Worksheets, when necessary, are included in the activity guide along with supplemental activities.





## Habitat Lap Sit

### Activity Introduction

Children will first identify the basic parts of habitat by analyzing what they need to live in their living environment. Then a fun activity will show kids how everything is interconnected, and one part cannot function without all the parts.

#### *Background*

People and other animals share some basic needs. Every animal needs a place in which to live. The environment in which an animal lives is called a habitat. An animal's habitat includes food, water, shelter, and space in an arrangement appropriate to the animal's needs. All life in a community, or habitat, is interrelated, each affected and dependent upon the other. These interrelationships and interdependencies are important to the life within that habitat.

#### *Plover Background*

The habitat where plovers feed and nest is harsh, with cold ocean wind, little protection, and many predators. Plovers rely on a secure food source, places to hide, and plenty of room to avoid predators. If a part of their habitat changes or is lost they may not be able to nest there.

#### *Activity*

##### *Part 1-Discussion*

In front of the group call on students to list the basic things their house provides, and then compare that to the place plovers have to raise their family and survive. Make a list of both side by side and highlight similarities and differences. Choose the basic needs and assign each of the children a part of the habitat to represent. (Done easily by numbering the choices and having children count off.)

##### *Round 1*

Instruct the children to form a circle and move in close with one another. Ask the group to turn to the right and take another step inward, so that the group is now very close together and each child is facing the back of the head of the child in front of them. Now, ask them to slowly sit down upon the person's lap immediately behind them (the person in front will be sitting on their lap). Ask them to observe how all the components of a habitat support and depend on one another.



## *Discussion*

An animal will be affected if any of the components of habitat are missing or are significantly affected so that the arrangement for that animal or others like it close by are no longer suitable.

## *Round 2*

Ask the group to stand up and get in a circle again, then to sit again as a group. After they have sat, tell the children that the Snowy Plover is losing a component of its habitat, explain a scenario to make it realistic. Choose food, water, space, or shelter. Ask the children who were assigned that component to remove themselves from the circle. This should cause a dramatic change in the circle's configuration, and the group will fall. After all the laughing has subsided, have them again stand in a circle.

## *Discussion*

What would have happened if another component had been taken away? What if only 1 or 2 of a single component was removed, would the circle still fall (they may want to try it to see)? If the habitat "falls" what happens to the animals that live there?

## *Conclusion*

All parts of a habitat are important and connected. For example without water the plover cannot survive, and the plants that give it shelter would not be there. The circle we formed was very delicate, and if one person got up, then there is a good chance the whole circle would fall.

The Western Snowy Plover is a species that is threatened, meaning its numbers are declining steadily. The Snowy Plover is considered an indicator species, meaning that its presence in its preferred habitat is a sign that the habitat and the other life in that community are healthy.

## *Questions*

If the Snowy Plover's numbers are declining, what does that say about its habitat?

Why do we care if a little shore bird is disappearing? Do we share the Snowy Plover habitat?

Now that you understand what makes up a habitat, and a Snowy Plover's habitat, what do you think are some of the things that are affecting the components of this habitat and making this circle begin to fall?

## *Materials*

1. White/Chalk board



# Avian Olympics

## Activity Introduction

Students will learn the physical strength and ability of migratory birds by comparing their own "fl ying" abilities to the birds.

### **Background**

Birds are amazing animals. They are capable of incredible feats of physical ability and endurance. Following each activity are some "Amazing Bird Facts" to help illustrate this.

### **Plover Background**

Plovers live along the Pacific coast from Washington State down to Baja California in Mexico. There are many amazing abilities, often migrating hundreds of miles between winter and summer homes. Although not much is known about their selection of breeding and wintering habitats,

Plovers will often return to the same beach where they were born, to breed and nest. Some Plovers stay at the same beach all year, while others will travel hundreds of miles to a new area for winter or summer. Plovers feed while on foot, catching dozens of flies and small insects each hour. They are extremely quick, snatching up flies with their tweezer-like bills. Plover chicks are also an amazing part of the story, running and feeding for themselves within a few hours of hatching.

### **Activity**

#### **Round 1-Fastest Flapper Contest**

Ask the group to spread out to give some "Wing-Flapping Room".

Tell the group that they are going to flap their arms/wings as fast as they can for 10 seconds. Ask that each person keep count of how many times they flap (demonstrate how to count each flap). Let the group flap for ten seconds, then ask each student their total number of flaps in that time period.

#### **Amazing Bird Facts-**

The Ruby-Throated Hummingbird can flap its wings 120 times per second.

Most songbirds can flap their wings about 12 to 16 times per second.

#### **Round 2- Migration Calculation**

The Snowy Plover is a migratory bird, which means it flies from one area to another seasonally. Sometimes migratory birds relocate over great distances. Calculate with your students the distance





a Snowy Plover would travel if it went from the top of its range down to the bottom.

### **Questions-**

How far is it from here to Mexico? Guadalupe to Mexico- 320 miles

How long does it take to drive? Driving time- 6 hours

How far is it to Washington State? Guadalupe to Washington State- 980 miles

How long would it take to travel there? Driving time- 14 hours

How far is it from Washington State to Mexico? 1300 miles

How long would it take to drive the whole way? 20 hours

If you had to walk, could you do it?

### **Amazing Bird Facts-**

Some migratory birds fly this entire trip nonstop. The Arctic Tern migrates from the Arctic to Antarctica every year, over three thousand miles each way!

### **Round 3- Longest Flapper**

Ask the group again to give themselves some "Wing-Flapping Room", and tell them that this time they are going to see who can flap the longest. Explain that they must flap-not slowly move their arms up and down-because they must be able to stay

in flight. Begin timing the group and give the final time for the longest Flapper.

### **Questions-**

Could you continue to flap your arms for more than an hour?

More than a day?

### **Amazing Bird Facts-**

The Golden Plover, a Snowy Plover relative, flies non-stop for 48 hours as it migrates from Nova Scotia to South America.

### **Conclusion**

Many of the birds we see each day are long distance migrators, such as swallows and ducks. When we visit the beach, the shore birds there may be stopping to rest during a long journey north or south. Even an ordinary sea gull may have flown thousands of miles stopping to rest at that very beach. Birds are amazing animals, capable of flying distances and at speeds we humans cannot do without help. Lets remember these amazing feats and abilities next time we are around birds.

### **Materials**

- White/chalk board to list fastest and longest flappers and to compare these to bird facts found in each activity.







## Shorebird Fast Food

### Activity Introduction

Children will act out the feeding of snowy plovers at the beach, collecting sufficient food while incubating eggs. Different recreational activities will be simulated in their feeding area to see the effects on the feeding birds. Children will begin to understand the pressure that beach visitors put upon feeding and nesting plovers, and why certain activities are not allowed.

#### Background

Snowy plovers nest away from the waves and beach in the "fore-dunes". The male and female take turns incubating their eggs and going to the beach to feed. They feed on flies, fleas, and small insects that live in the kelp and debris that washes onto the beach. Plovers need to catch many insects each day to survive. They hunt among the kelp running quickly to catch flies in midair and insects in mid-jump. Once a bird is finished feeding it returns to the nest to incubate the eggs, and the other bird goes out to feed.

Often when people are on the beach these birds cannot feed, but have to wait for the people to pass by. When the birds cannot feed quickly or get enough food, they are not as healthy and the chances for their eggs to hatch decreases. This is why we must learn to share the beach with feeding birds and wildlife.

#### Activity

Children break into two equal groups, a plover group and a beach visitor group. A rectangular playing area is created and small stones or pennies are scattered throughout the playing area (10-20 per plover). One edge of the playing area represents a safe haven for plovers while the opposite represents the ocean. The playing area is both the feeding habitat and the beach where people play. (See diagram on next page.)

**Plover Group-** Each person plays the role of a plover traveling from their nesting area to the beach to feed. While feeding they must avoid beach visitors and their activity. As visitors approach plovers move back to safe haven waiting for them to pass. If a plover is touched by a person they have been injured and they are out of the game for that round. Each plover gathers as much food as they can in their hands and runs back to the safe haven where their nests are.

**Beach Visitor Group-** Each student is given a role to play out, making noises and moving like the role they



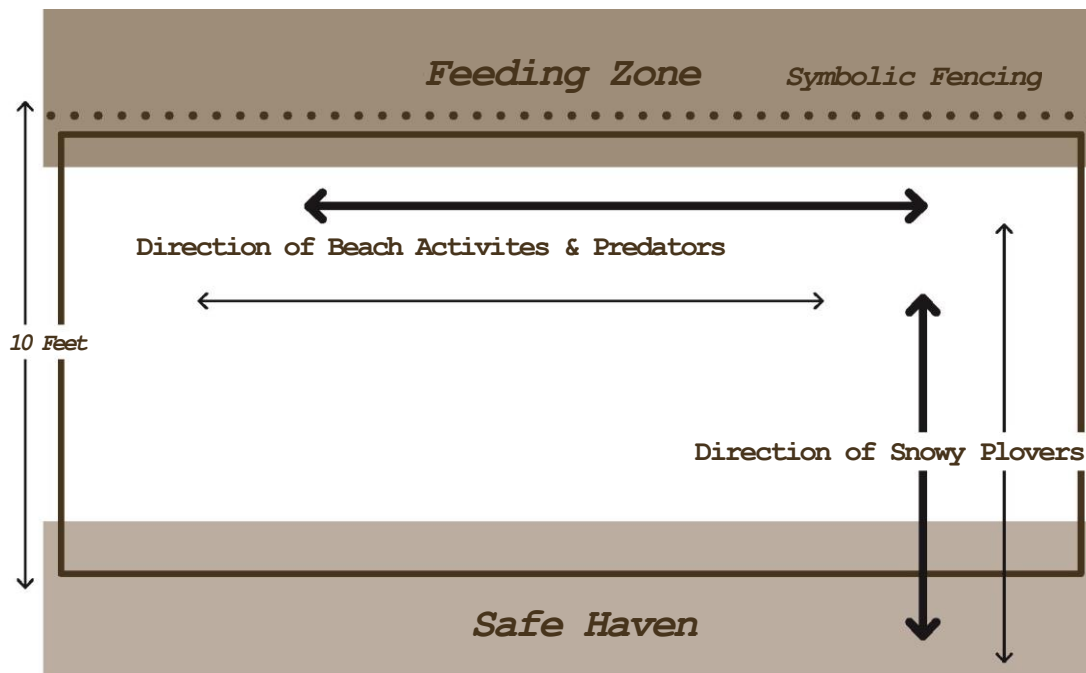


are given. They are instructed to enter the playing area and ignore the plovers feeding, but concentrate on their activities. They should not chase the plovers, but are to pass through the playing area to the other side.

Playing the game- Each round should last long enough for all "visitors" to move through habitat, but short enough so plovers cannot grab all the food. Approx. one minute depending on the number of participants.  
 (after a few rounds, have the groups reverse roles)

**Round 1-** Plover group feeds without beach visitors in area, collecting as much food as possible.  
 Discussion- Hands filled with food represent healthy adult plovers able to care for their developing eggs.

**Round 2-** Plovers begin feeding, visitors move through playing area in small groups playing games and walking.  
 Discussion- Plovers- Did you collect as much food as the time before? Did it take you the same amount of time or longer? Visitors- Did you notice the scattered food?





**Round 3-** Visitors move into area first, one sets up a picnic, the others run around a bit more than last time. Visitors with the role of "Dog off leash" run around in and out of playing area, but do not chase birds. Plovers move in to feed, avoiding the area where picnic is, and running back to safe area when people approach.

Discussion- Plovers- How much food were you able to collect? How would the increase in activities impact the birds? Visitors- Could you see how the picnic impacted the area plovers could feed? Was it clear how a dog off leash might scare the plovers more?

**Round 4-** Plovers move into area and begin feeding. Visitors move through in bigger groups, some act out more impacting activities, such as OHV's and horses. Discussion- Plovers- Were you able to get that much food? How much harder was it when OHV's and horses were there? Would you have to stay longer at the feeding area to get enough food? How would this affect the incubating eggs? What happens if a plover cannot eat enough food?

**Round 5-** (shrink area that visitors can access to represent symbolic fencing, with food spreading beyond fenced area) Plovers move into feeding area and visitors move through in small groups. More impacting uses like OHV's and horses do not occur. Plovers now have a closer safe area to avoid people and allowing them to feed more.

## ***Post-Activity Discussion***

Could everyone see the impact of different levels of activity in the plover feeding habitat? Explain the difference between passive recreation and active recreation. Talk about the view of plovers that all those things represent predators.

Was it more impacting when OHV's and horses were moving there too? These activities represent a large predator, and birds stay even further away.

When the area that visitors could access was decreased how did it affect the plovers? Symbolic fencing helps to give Plovers a safe area to nest and to seek shelter when people are around.

Was there still enough room for visitors to have fun? Symbolic fencing still leaves the area next to the waters edge open for use, and hopefully enough room for people to enjoy the beach.

Can anyone explain why plovers think we are predators? We are large mammals who look threatening to these tiny birds. It is in their instinct to protect themselves and their nests. Plovers cannot fight, so they run and hide avoiding close contact with people.





## ***Conclusion***

The beach is an important place for many birds like the snowy plover. Understanding their needs helps us to look out for them when we visit the beach. Some beach activities can really hurt Plovers, or scare them away from their feeding areas. If we share the beach with plovers by staying out of nesting areas and obeying some of the rules to protect them, then they can raise their chicks and we can enjoy the beach together.

## ***Materials***

1. Dry beans, pennies, or pebbles to represent food (10-20 per student)
2. Area big enough to represent habitat (minimum 20 feet wide by 50 feet long)
3. Long rope or string to separate safe area and feeding area
4. Cards with recreational activities printed on them to hand out to Visitors group.

### Recreational Activities Include:

- Ball or Frisbee playing
- Walking
- Dogs on or off leash
- Fishing
- Off-Road Vehicles
- Horseback riding
- Kite-Flying
- Fireworks
- Picnicking



## Migration Headache

### Activity Introduction

Students will act out the journey of migratory birds to learn the importance of stopover habitats and the effects of pollution and habitat destruction on migratory bird populations. This active game involves moving between wintering and nesting habitats with the stopover habitats being changed to mimic changing conditions.

#### **Background**

Migratory birds often travel thousands of miles between wintering and nesting habitats. Their journey relies on places where they can rest and build up energy to continue. These places, often called stopover habitats, may support hundreds of thousands of birds during just a few weeks of the year.

(A good analogy is a refueling station along the road during a family trip. Without refueling the car would not be able to go.)

The stopover habitats are often marshes and wetlands, rivers or lakes. If people remove a marsh or wetland, build around a lake, or divert a river; than the stopover habitat those birds needed is damaged or gone. Imagine flying for hundreds of miles to find the place you planned to rest completely different. These habitats can be damaged by pollution as well, the birds landing and finding all the fish gone, or feeding on contaminated fish and dying.

#### **Plover Background**

Some migratory birds, such as the Snowy Plover,

require stopover habitats in order to complete their migration. Because migrating birds travel hundreds or thousands of miles between nesting and wintering grounds, resting and feeding sites, or stopover habitats are crucial. Snowy Plovers require an estuary or beach habitat for their breeding, stopover, and wintering habitats. They find shelter from the wind among plants and driftwood on the beach, and feed on small insects at estuaries and on beaches.

#### **Pre-Activity Discussion/ Setup**

This activity is best played outside, but can be adapted to an indoor gym or rec. area. Setup involves placing the designated stop over place holders (paper plates) along the middle of their migration area and designating wintering and nesting lines to cross at opposite ends. (Appropriate distances are indicated on diagram)

To prepare the paper plates as stop over habitat, color code them, a simple mark will work, to represent different circumstances which may occur during the migration route such as:



- Negative Factors** (students or stopover plates removed from game)
- Contamination along river kills birds in estuary (indicate by a specific color under plate)
  - Bird lands on a pasture where hunting is allowed (indicate by a specific color under plate)
  - Coyote pack hunts down birds while sleeping (indicate by a specific color under plate)
  - Disease among other resting birds spreads to new arrivals (indicate by a specific color under plate)

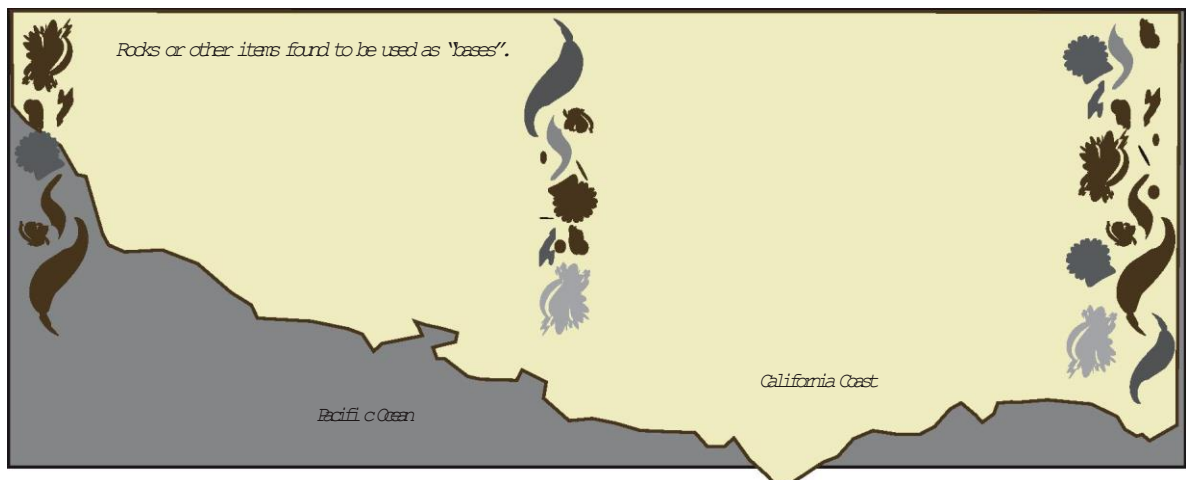
- Positive Factors** (students choose individuals to return from the sidelines)
- Trash collected from beach and lagoon, improving feeding (indicate by a specific color)
  - Biologists catch birds and give them shots to prevent disease (indicate by specific color)

-Good weather helps increase fish for feeding birds (indicate by specific color)

Use these colored factors in later rounds, balancing their use to emphasize the impacts of habitat destruction (contamination) as compared to natural or less impacting factors (coyote predation). Also emphasize the improvements by placing more plates out and more students to participate.

- Draining of a wetland to build a new housing development (remove plates)
- Dam is built covering a section of river used by migrating birds (remove plates)
- Estuary once polluted by a sewer plant is cleaned (add plates)
- Wetland is restored (add plates)

| ◀ 70-90 Feet ▶ |



Nesting Habitat

Stopover Habitat

Wintering Habitat





## Activity

Students break into groups of three or four and migrate together. Match the number of people allowed per plate to the group sizes. All students line up on one side (summer habitat), and migrate first to the middle, then to the opposite side (winter habitat). Begin with slower migrations with enough plates for all and watch for kids running and pushing.

**Round 1-** (Enough plates for all) Arctic Terns migrating from Alaska to South America. Flying for 30 hours straight they stop off in Washington state to rest and feed.

(Move to plates)  
After resting for a day and eating small fish, they fly on towards South America. (Move to other side)

**Discussion-** All the birds got the energy and rest in Seattle to continue south for winter.

**Round 2-** (Take away a few plates) Canada Geese fly from Texas to Wyoming on their way to Canada for the summer.

Flying overnight the Canada geese arrive at a small lake to feed.

(Move to plates)  
The flock has grown larger than last year, so large that not all geese find enough food to continue migrating (some students move to sidelines)  
The geese continue their journey. (Move to other side)

**Discussion-** Populations naturally grow and shrink based on available food and space.

**Round 3-** (Take away more plates, include a negative aspect found under plate) Song birds travel from California to Central America for winter. Arriving in the Tiajuana Estuary to feed and rest, but the estuary has shrunk due to development. (move to plates)

(Groups look under plates for a specific color)  
Some birds drink from contaminated water and die (groups with corresponding color are out of game)  
Song birds feed and continue migration to Central America.

**Discussion-** Shrinking habitats from development and contaminated water from urban runoff are problems affecting areas all around the world.

**Round 4-** (Take away more plates, but include a positive aspect found under plates) Plovers move onto large beach for summer breeding and nesting. Arriving in groups along the beach, the birds find fewer places to nest due to a new housing development. (move to plates)

(Groups look under plates for a specific color)  
More nesting birds have success because dogs are not allowed on the beach. (groups with corresponding color invite an equal number of students who are out of game to return)



Plovers complete nesting and move to other beaches to spend winter

**Discussion-** Dogs on the beach look like predators to plovers, scaring them from their nests. The more time they spend on the nest, the more likely the eggs will hatch.

**Additional Rounds-** (Use the different positive and negative impacts to place or take away plates, and use the colors to show different situations)

**Post-Activity Discussion-** Plovers, and all birds that migrate, are affected by any change which occurs in or around a habitat they utilize. Imagine how many of the birds you have seen were actually migrating through from a distant land. We may not realize that certain activities or changes people make can harm migratory birds. By thinking about the journey birds make, and understanding some of the things they need, we can help them and their offspring to continue their journeys far into the future.

#### **Additional Activities-**

Visit some critical bird habitat, like a marsh or estuary with students and observe birds feeding and resting during their migration.

Contact a local wildlife refuge manager for information about migratory birds of the area.

Request a class visit or take a field trip to visit the refuge.

Contact a local National Audubon Society chapter to learn when and where are good locations to observe birds flying over during migration.

Study other migratory animals, such as whales, Monarch butterflies, or Salmon; to discover the journeys these creatures take every year.

**Conclusion-** Migration can be a headache for birds if the habitats they need are over developed, contaminated, or simply overused by people. It takes all people working together to protect areas for these animals. There are many simple things we can do to protect migratory birds, such as dispose of all trash and toxic materials properly, or following the rules at our favorite beach. There are many functions which migratory birds play which make our lives more enjoyable. Plovers eat flies on the beach, and many birds eat mosquitos from ponds near our homes. Lets all help migratory birds and make sure it's not a headache for the next bird who flies by our town.

#### **Materials**

1. 20 Stopover habitat designators (paper plates work well), 14 blank, 3 with negative color indicators, 3 with positive color indicators
2. String or cones to mark the sidelines and the wintering and nesting areas





## The Perfect Beak

### Activity Introduction

Through stations children learn that bird beaks are adapted to feed on specific things. Different objects are used as analogies to illustrate this.

#### Background

It would be impossible for a hummingbird to gobble up a mouse, or for a hawk to slurp up some nectar from a flower. Each type of bird has a special beak and tongue adapted to eating certain foods. Birds use their beaks as tools to collect and prepare food for eating. Students will find out which beaks are best for tearing, scooping, cracking, and picking, and they will try to find out which types of “tools” go with which types of “food.”

Hummingbirds have long hollow beaks they use to probe flowers for nectar. The beak protects the tongue that slurps up the nectar. The tongue is so long that it is curled up inside the beak, and uncurled to feed.

Curllews, godwits, kiwis, and American avocets, which are shorebirds, have long, strong beaks they use to probe for worms and other small creatures in mud, sand, and water.

Cardinals, Sparrows, jays, and finches have very

short conical beaks, that are very strong and can break open tough seeds.

Brown pelicans and spoonbills have long flattened or pouch-like beaks that they use to scoop up fish and other aquatic creatures.

Some ducks and Eurasian Wigeons have bills that act like strainers to filter tiny plants and animals from the water.

Plovers, warblers, and flycatchers have small, sharp, pointed beaks for picking insects from leaves, kelp, logs, and even midair.

#### Plover Background

The beach is hopping and swarming with food, and plovers know how to find and catch their meals.

Plover beaks are like little tweezers, specialized for catching a fly in midair, or catching a sand-flea mid-hop. Plovers feed both day and night along the “wrack line” where all the kelp is piled up along the beach. Watching a plover feed is fun, they stand very still, see a fly, and dart over to snap it up with their



beak. sometimes a Plover will run through a swarm of flies snapping its beak to catch as many flies as it can.

## **Activity**

### *Setting up activity stations*

1. Set up six different stations, each with a special type of "food" that fits one of six different types of beaks. At each station there are three different tools—one that fits the food at the station, and two that don't fit.

2. Make a standup sign for each station that tells what type of food is represented. (i.e. Station #1 Nectar in a Flower)

**Station #1:** Water in a thin vase for nectar in a flower. (hummingbirds)

Tools: Eyedropper or straw\*

Envelope or small fishnet

Large scoop or slotted spoon

**Station #2:** Large saucepan filled with dry oatmeal, with fake worms (or grapes) buried on the bottom to represent worms buried in the mud. (curlews, godwits, kiwis, avocets)

Tools: Chopsticks\*

Nutcracker or pliers

Strainer

**Station #3:** Whole walnuts or other nuts to represent seeds with hard coverings. (sparrows, cardinals, jays, and finches)

Tools: Nutcracker or pliers\*

Tongs

Chopsticks

**Station #4:** Styrofoam chunks floating in an aquarium (or punch bowl) filled with water to represent fish and other aquatic animals. (spoonbills and brown pelicans)

Tools: Large scoop with slotted spoon\*

Eyedropper or straws

Chopsticks

**Station #5:** Puffed rice in an aquarium filled with water to represent tiny aquatic plants and animals. (Some ducks and Eurasian wigeons)

Tools: Strainer\*

Forceps or tweezers

Tongs

**Station #6:** Rice spread on clean ground to represent caterpillars and other insects. (plovers and warblers)

Tools: Forceps or tweezers\*

Envelope or small fishnet

Nutcracker or pliers





### **Pre-Activity Discussion/ Explanation**

1. Ask: What do you know about beaks? What are they used for? Are they all the same? Why would birds have so many shapes of beaks? From ducks to pelicans here they will learn adaptations, how plants and animals change over time to survive in their habitat.

2. Explain that the students will go to each activity station as a small group. There will be three different tools at each station, each of which represents a different type of bird beak function. They must decide which "beak" (tool) would most efficiently get the food at each station. Students decide by trying out each tool. They can discuss their results with others in the group, but they will record their own choices on "the Perfect Beak" worksheet. Tell the students to pick up the food with a tool, but not to eat it! Set a time limit for how long students stay at each station (~5 min.). Students must leave the station as they found it.

3. Hand out a copy of "The Perfect Beak" worksheet to each student and explain how to complete it. At each station they will take turns trying the tools with the food. Once they choose the best tool, they write the name of the tool, next to the station they are at, on the worksheet. On the worksheets are different birds and their beaks. On the line under each picture they write the number of the station that represents the correct beak. For example, they write "1" under

the hummingbird, as the nectar station 1 is the hummingbird's food.

4. Divide the class into six teams; start each team at a different station.

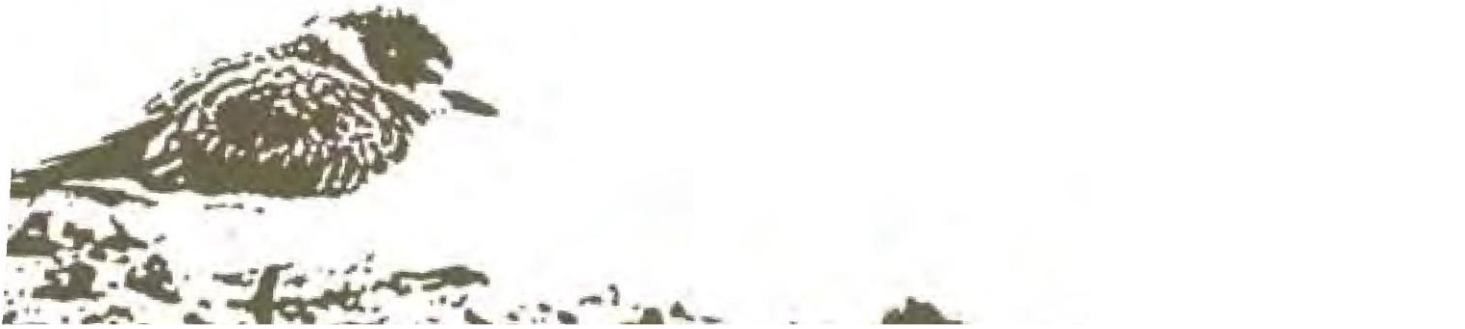
### **Post-Activity Discussion**

1. Group discussion: After teams have rotated through all stations, they return to their desks for a group discussion.

Ask: Why do you think birds have so many types of beaks? (Birds are adapted to their habitats, and in each habitat there is only a certain type and amount of food available. Birds have adapted to feeding in their habitat efficiently to survive.)

Ask: How can specialized beaks help some birds stay alive? (A bird with a specialized beak can often eat a certain type of food that no other birds can eat, such as a hummingbird is able to get nectar out of a long, narrow flower, while other birds cannot find food.)

Ask: How might a specialized beak hurt a bird? (If a bird's habitat changes and its food is no longer available, the bird might die because it can't eat anything else. Some birds such as crows and gulls have versatile beaks. Crows can eat fruit, nuts, berries, dead animals, and even fish and small rodents. This is one of the reasons why Crows are found in so many habitats.)



### **Conclusions**

All living things have adapted over time to live in their natural habitat. Plants and animals have evolved together to meet survival needs of their species. Adaptations help them to survive in their habitats. When habitats are changed and a bird's preferred food is no longer available, species dependent on that habitat may not survive. This can then hurt other parts of that habitat, like breaking one link in a chain.

### **Materials**

1. "The Perfect Beak" worksheet
2. Two eyedroppers or straws (if using straws collect two per student; students should not share straws)
3. Chopsticks (3 pairs)
4. Nut crackers or pliers (3)
5. Scoops or slotted spoons (2)
6. Strainers (2)
7. Heavy envelopes or small fish nets (2)
8. Forceps or tweezers (2)
9. Tongs (2)
10. Raw rice and puffed rice
11. Large containers or bowls
12. Fake worms or grapes
13. Dry oatmeal
14. Tall thin vase
15. Large saucepan
16. Walnuts or other nuts in shell (4-6)
17. Styrofoam chunks

### **Additional Activities and Applications**

1. Discuss other types of adaptations in birds. (Long legs for wading, big wings for gliding, sharp eyes for seeing small rodents, bird songs for mating, feathers for lightness and warmth, bright colors for mating and camouflage.)
2. Conduct research into other examples of adaptations in California's plant and animal communities.
3. Visit the beach to observe the wrack line, the flies and sand fleas that plovers feed on. Observe the different shore birds at the beach and how they use their specialized beaks to feed in different ways and zones.



Cardinal  
*Cardinalis cardinalis*



Long-billed curlew  
*Numenius americanus*



Anna's hummingbird  
*Calypte anna*



Brown pelican  
*Pelicanus occidentalis*



Eurasian wigeon  
*Anas penelope*

Station	Best Tool	
1		
2		
3		
4		
5		
6		

U.S. Fish and Wildlife Service  
2003

