Student Worksheet – The Sea Bird Mystery KEY

Name\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_ Period:\_\_\_

Your response.

1. What is the species of alcid flock of seabirds that appears to have washed up onto this Tillamook, Oregon beach? Cite evidence from the story and from the bird photos to support your argument.

This is a Cassin’s Auklet. In the first paragraph, the lines, “The poor bird had met its end on the shore and it had washed up with its white belly up and its dark grey wings splayed on either side of its now stiff black webbed feet. Its black beak was agape, as if gasping for breath, and they could see a little white spot just above each of the lifeless glassy eyes,” indicate a bird that matches the picture of the Cassin’s Auklet. The photo of the Casssin’s Auklet shows a bird that matches the description in the Data Section.

1. What is the normal food chain for these birds?

Normally, these birds feed on small fish and krill.

1. What part of the food chain has been disrupted?

The Pacific Blob has disrupted what is normal upwelling along the Western Continental Shelf of the United States. Upwelling is what brings nutrients to fertilize phytoplankton and zooplankton, (copepods), from cold deep ocean waters to the surface waters of the ocean along the Western Coastal waters of the U.S. If there is less krill, then there will also be less fish and less sea birds of the varieties that rely on krill as a major part of their diet. No disruption occurred in the number and types of predators that prey on auklets.

**Partner with another student and together answer questions 4 & 5**.

1. What could be a likely cause of death of these birds? Why do you think so? Cite evidence from the data and the story to support your argument.

The birds starved to death. In paragraph 2, Dad said,” but I can see that they look rather emaciated”, regarding the appearance of the birds. They were very much under their normal weight and that is consistent with circumstances of surface ocean waters lacking sufficient nutrients for sea birds that feed on small fish and crustaceans.

1. What do you think would be the short term (one year) and the long term (5 years) results of cooling ocean temperatures on the Pacific Coast? Why do you think so? Cite evidence from the data given to support your answer.

From Figure 3 about the Cassin’s Auklet, the data indicate that the population of these birds changes every year, but that the general trend is a downward curve. A successful breeding season can change the population within one year. However, one successful season will not necessarily boost the overall population that has experienced a downward trend as shown in Figure 3. Fledglings need beneficial environmental conditions in order to survive to adulthood. However, if cooling ocean temperatures persist for five years, this translates into more plentiful food for the Cassin’s Auklet. Successful breeding and access to food for several years would result in increased survival rate of the young auklets. These survivors would in turn successfully breed, thereby potentially increasing their numbers.

Draw a Food Web to demonstrate the effects of Warm Pacific Coastal Ocean vs. Cold Pacific Coastal Ocean conditions on the Mystery Seabird. The Seabird will be the top of the Food Web.

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| --- | --- |
| **Pacific Coastal Ocean Water with the Hot Blob** | **Normal Pacific Coastal Ocean Water** |
| Cassin’s Auklet | Cassin’s Auklet |

1. Do you think that this type of sea bird die-off could be happening in other parts of the world other than Pacific Northwest coastal areas? Explain your thinking.

Yes, sea birds would starve in great numbers in any coastal area where upwelling is disrupted due to abnormal deviations in surface ocean water temperature. These conditions are occurring along the West coast of North America, from the Alaska to Baja California.

(Optional)

System Analysis of the Ocean Habitat for these Plankton Eating Birds:

Energy Input: Solar Energy, Heat Energy, Stored Chemical Energy in Food Sources

Matter input: Krill, small fish, water, nesting sites

Energy output: Sound energy, heat energy, kinetic energy

Matter output: Guano, eggs, offspring, carcasses