

# ECOLOGICAL DECISION MAKING

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## **Rationale:**

To provide a vehicle to discuss and make ecological decisions

## **Intended Grade Level:**

High school

## **Objectives:**

- To raise environmental awareness
- To provide a mechanism for environmental decision making
- To act on environmental decisions

## **Procedures:**

Introduction followed by individual, small group, and large group discussions

## **Evaluation:**

Decision making model

Pebble Limited Partnership the developer of the Pebble Mine Project has announced its goal to complete a Prefeasibility Study in 2012, with permitting to follow in their development of the Pebble Mine Project. The EPA is currently taking public comment on a draft Bristol Bay Watershed Assessment that the U.S. EPA released in mid-May to gather public feedback on the project.

Your task is to use the following decision making model and address the question of opening the Pebble Mine in the Bristol Bay Region. You should be guided by the statement made by Aldo Leopold from the Sand County Almanac, "Examine the question in terms of what is ethically and aesthetically right as well as what is economically expedient."

### **I. Background Information:**

This information has been provided for you as a place to start. Use it to help you complete the decision making model. You are expected to rely upon your own considerations, your group discussions, and individual and group research to complete the decision making model. More information can be found at [www.pebblewatch.com](http://www.pebblewatch.com)

1. The Pebble Limited Partnership holds mineral rights to 186 square miles of land surrounding the Pebble deposit. This land is owned by the State of Alaska.
2. The state-owned land is located within the Lake and Peninsula Borough, about 17 miles northwest of the village of Iliamna.
3. Pebble is the largest (known) undeveloped copper ore body in the world, estimates in February 2008 indicate that the “measured and indicated” mineral resource totals 5.1 billion tons, with another 4 billion tons “inferred.” The deposits are thought to contain an estimated 72 billion pounds of copper, 94 million ounces of gold and 4.8 billion pounds of molybdenum.
4. Northern Dynasty Minerals, Ltd. estimates that Pebble contains over \$300 billion worth of recoverable metals at early 2010 prices.
5. In a Preliminary Assessment released by Northern Dynasty Minerals Ltd. The proposed mine would be open pit and underground and would be approximately two miles wide and several thousand feet deep. There would also be four earthen dams measuring 740, 700, 400, and 175 feet tall to hold back the tailings ponds.
6. Bristol Bay includes eight major river systems: Naknek, Kvichak, Egegig, Ugashik, Wood, Nushagak, Igushik and Togiak. The Kvichak River, which runs from Lake Iliamna (the largest freshwater body in Alaska) to Bristol Bay, which is home to the single largest salmon run on the planet.
7. In Bristol Bay the 2008 harvest of all salmon species was approximately 29 million fish, and the value of the 2008 commercial catch topped \$113 million with the payroll for fish and wildlife-related employment totaling \$175 million.
8. More specific objections, perceived or real, to the Pebble Mine are as follows:
  - (a) The fish and wildlife in the region are too important to risk in exchange for the economic benefits of the mine.
  - (b) Pollution of the region is a realistic concern in mine design and operation.
  - (c) Earthquake hazards in the area are poorly known.
  - (d) That companies that own Pebble are foreign based and will not help the American economy.
  - (e) The mines will bring in outside employees to work in the mine.
  - (f) The mine will destroy the subsistence lifestyle of the people in the region.
  - (g) Wildlife habitat will be destroyed impacting subsistence hunting.
  - (h) The mine will produce billions of tons of waste that will be left behind when the mine closes.
  - (i) The culture of the local native groups in the region will be destroyed.
  - (j) Commercial and sport fishing jobs would be jeopardized.

(k) The Pebble Limited Partnership is untrustworthy.

(l) Future generations depend on us to protect the land.

## II. Identify and Define The Problem

Do this for yourself now. Later, examine II with your group. It may need revision.

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## III. Is There An Ethical Dilemma?

Identify whether II above conflicts with what you believe is right.

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## IV. Value Clarification.

- (A) Use the "I" value sheet and list at least 5 personal values to support or go against III.

	RANK	PERSONAL VALUE	DEFINITION
•	_____	_____	_____
•	_____	_____	_____
•	_____	_____	_____
•	_____	_____	_____
•	_____	_____	_____

- (B) Rank these values from 1 (most important) through 5 (least important)

- (C) Are values 1 and 2 above in conflict when you look at the problem?

YES \_\_\_\_\_ NO \_\_\_\_\_

- (D) List as many alternatives to the problem as you can.

	RANK	ALTERNATIVE
•	_____	_____
•	_____	_____
•	_____	_____
•	_____	_____
•	_____	_____

- (E) Rank your alternative solutions from 1 (most important) through the least important.

- (F) State your #1 alternative solution.

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- (G) List the values that you hold that make this your #1 solution.

"I" VALUE	DEFINITION
_____	_____
_____	_____
_____	_____
_____	_____

- (H) Now state your least important solution.

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- (I) List the values that you hold that make this your least ranked solution.

"I" VALUE	DEFINITION
_____	_____
_____	_____
_____	_____
_____	_____

- (J) SOLUTION

State your #1 ranking from IV (D) above

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- (K) CONSEQUENCES

If your solution were implemented what would some probable consequences? Be sure to state who or what is directly affected by each consequence.

WHO/WHAT	CONSEQUENCE
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

- (L) GOOD VS BAD

Place a (+) beside each good consequence and a (-) beside each bad consequence. Ask yourself this question each time, "Would I be willing to have this action or consequence be applied to me?"

- (M) Tally your + and - marks.
- (N) ASSESSMENT OF CHOICE

Do you hold any values that conflict with your #1 choice or its consequences?  
NO \_\_\_\_\_ YES \_\_\_\_\_ If yes, list them:

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If yes, restate your solution or pick another solution and re-step through the process from III to the end. If you answered no, your decision is valid for you at this time in your life.

## V. Opposition

In anticipation of your small group discussion, give reasons why others may not agree with your solution.

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## VI. Small Group

Now meet in your small groups. Begin with a general discussion of your problem. You may choose a person to chair your discussion and/or subcommittees to research portions of your problem. Go through the entire decision making model again starting with II through V. Attempt to reach group consensus, but remember that a minority report to the class is possible.

## VII. Class Discussion

Each small group will elect a spokesperson to report to the class, followed by a class discussion of your group's findings.

## **VIII. Conclusion**

Consider your own solution, the small group's solution, and the class solution to the problem. Can one solution be applied to the problem? If so, state it here.

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## **IX. Implementation**

What can you or your class do to let others know about your solution to the problem?

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Design a means of putting one of your solutions into action.

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## **X. References**

Decision making model adapted from John Hendrix, Ball State University.

Lesson Plan adapted from Ecological Decision Making, The Yellowstone Wolf, Carl E. Max

Pebble Mine material adapted from Pebble Watch, Bristol Bay Native Corporation

## **XI. "I" Value Sheet For Making Environmental Decisions**

The following list provides general overview of values that one may use to help the decision making process. Cross out values that have no meaning to you or add other that you find necessary. Be sure to define the added values.

1. AESTHETICS - the appreciation and enjoyment of beauty for beauty's sake
2. ACTIVISM - the taking of direct action to achieve a political or social end
3. ADVOCACY - to speak in support of something
4. ALTRUISM - concern for the interests of others
5. APPRECIATION - sensitive awareness
6. ARDOR - emotional zeal
7. BEAUTY - the quality of being pleased
8. BENEVOLENCE - an inclination to do good
9. COMMITMENT - binding, as a pledge or promise
10. CONCERN - interest in or regard for a person or thing
11. CONSERVATISM - behavior tending to preserve established institutions
12. DEPENDABILITY - trustworthy
13. DEVOTION - loyalty or deep affection
14. EDUCATION - process of teaching or gaining knowledge
15. EMPATHY - ability to share feelings
16. ENDANGERED SPECIES - organisms that may become extinct
17. ENVIRONMENT - all conditions in the surroundings
18. ESTEEM - to value highly
19. ETHICAL - having a system of standards
20. FERVOR - great warmth of emotion
21. FUNDAMENTAL - forming a basis of action
22. HARMONY - agreement in action
23. HONEST - truthful or trustworthy
24. IDEALISM - behavior based on conception of things as one thinks they should be
25. INNOCENCE - without guile
26. INNOVATIVE - willing to make changes
27. INSPIRATIONAL - stimulus that results in creative thought or action
28. INTEGRITY - complete honesty or sincerity
29. INTERDEPENDENCE - mutual support, aid, or comfort
30. KNOWLEDGE - range of information or understanding
31. LOVE - strong affection for someone or thing
32. MAJESTIC - grand or stately
33. MORALITY - rightness or wrongness of an act
34. NATURAL - something normally produced or existing
35. OWNERSHIP - belonging to oneself or itself
36. PEACEFUL - free from disturbance
37. PLEASURE - delight
38. POETIC - displaying beauty or imaginative qualities

39. POSITIVE - explicit, confident
40. POWER - ability to do or act
41. PRISTINE - unspoiled
42. RESOURCEFUL - able to deal effectively with problems
43. SELF-CONTROL - ability to deal with situations alone
44. SELF-FULFILLED - bringing about one's personal goal
45. SELF-PRESERVATION - ability to survive alone
46. SPIRITUAL - something felt internally
47. STEWARDSHIP - responsibility to something
48. UPSTANDING - honorable
49. WILDNESS - living in a natural state
50. WISDOM - behavior showing good judgment