

# Teacher's Notes

## 1: Environmental Issues (pages 1–44)

### Reading 1: "In Time of Crisis"

#### Pre-Reading (page 3)

Before getting into the pre-reading questions, ask students to take a few minutes to read the unit introduction. Or teachers may wish to read the introductory paragraphs aloud. Ask students to identify the disciplinary backgrounds of the authors and guess at the basic topics they will be reading about. After reviewing the introduction to the unit and discussing the authors' backgrounds and student expectations regarding the unit content, give students 10–15 minutes to write one-paragraph responses to the three questions that precede the reading. You may want to put the students in small groups and give them about 10 minutes to discuss their ideas. Eavesdrop on groups and listen for interesting ideas. When discussion begins to fizzle out, do a whole-class debrief. If you have heard interesting ideas, invite a spokesperson from each group to summarize his or her groups' ideas. Be sure to get students' responses to Pre-Reading Question 3. Students should suspect that the reason the article was reprinted is that it either has historical interest or the issues it raises are still relevant today. In fact, both are true of this reading.

#### The Reading (pages 4–7)

While the reading can be done either in-class or as homework, it is a good idea to have students read the introduction, or read the introduction to them, in class. In particular, point out that students will encounter many present-time references in the reading. Ask them to scan Paragraph 1 and Paragraph 3 and identify words that indicate present time. Ask what the words *now* (Par. 1) and *recently* (Par. 3) mean in the context of this reading. Make sure students recall that the original publication date is 1991 and that *now* and *recently* have to be understood in that context.

Ask students which of the two contexts could conceivably be relevant today. (The answer is *now*. When Foreman talks about environmental impacts that are happening *now*, it is highly likely that what was true in 1991 has not changed much since then. Generally speaking, the environmental problems we faced in 1991 are still with us. On the other hand, when he notes that: "Professor Michael Soule, founder of the Society for Conservation Biology, recently warned that vertebrate evolution may be at an end due to the activities of industrial humans," *recently* refers to an event that took place around the time Foreman wrote the article. *Recently* has no current relevance.)

With these preliminaries out of the way, students should be ready to read the piece. If you assign the reading as homework, you will probably want to assign **Getting at the Matter** along with it as a comprehension check. It is best to save the **Critical Focus** for in-class work. If you have students do the reading in class, you can do **Getting at the Matter** either before or after the first **Critical Focus**, the purpose of which is to sensitize students to the idea of tone. One advantage to discussing

the tone of the reading first is that in analyzing the tone, they will be doing considerable rereading and close reading of the text, which will increase their familiarity with the content.

### Critical Focus: Identifying the Tone of a Text (page 8)

A good way to start is to explain that tone refers to those qualities in a piece of writing that show the writer's feeling about the subject. Point out that tone is often identified in terms of the adjective that seems to describe the writer's way of discussing the subject. Then have students look over the list of Some Useful Adjectives for Describing the Tone of a Text and determine how many they are familiar with. You might want to give them some time to look up unfamiliar items and discuss the meaning of some of these by illustrating with impromptu examples.

Return to the **Critical Focus** box and give students a few minutes to read it, then go over it and, in particular, discuss the example. If they can see how the language of the first example "sounds" accusatory, while the language of the second "sounds" merely concerned, they are getting the point. Next, have them try work through the **Critical Focus** application exercises with a partner. If some pairs are struggling, work through one or two exercises as a group. Students might find it necessary to use a dictionary to look up words like *blitzkrieg*, *divine*, or *mandate*. Based on your knowledge of your students' capabilities, you can prepare a glossary with these terms defined to save time.

### Critical Focus: Application (page 10)

Various adjectives may be used to answer the questions. Some suggested answers follow.

1. Tone: concerned, dramatic. Clue: most critical moment, radical and unprecedented change, never before, drastic reduction in planet's biological diversity.
2. A *blitzkrieg* is a war conducted with great speed and might. It is also associated with Hitler and with Nazi fascism. The author is implying that man is engaging in a war against the environment and suggesting that this action is like the Nazi military take-over of Europe during WWII. Tone: angry, upset, inflammatory.
3. Tone: contemptuous, critical. He uses the terms *smorgasbord table*, *magic kitchen*, *plates*, and *belly up to the bar* to show that man thinks of the environment as nothing more than a never-ending eating establishment.
4. *Divine mandate* means a command from God. The author is suggesting that humans are acting as if justified in doing anything they want because they feel God has commanded it, an idea that he rejects. Tone: indignant, angry, upset
5. Tone: alarmed, angry, critical, impassioned, urgent

A good follow-up activity for this is to have students get into groups and work on additional paragraphs to discover for themselves how the author's choice of language influences tone. Once the students have finished with these paragraphs, they can present their findings to the class.

Several other passages where you might point out elements of strong *tone* include:

Paragraph 4: *conservation battle/battle for life itself*. The implication is that protecting the environment is like war because there are those who prefer to destroy it. *Tone: dramatic*

Paragraph 5: *threshold of biotic terror*. The author compares the effects of human activity on the environment as a form of terrorism. *Tone: dramatic, inflammatory*

Paragraph 6: Human . . . runs the *business engines of the world*. He equates business with the engine, a distinctly “non-natural” concept. *Tone: critical, cynical*

Paragraph 8: *all things are interconnected, interrelated . . . all living beings have the same right to be here*. The author reveals his values. *Tone: impassioned, reverent*

Paragraph 10: *pretty picture postcards*. Here the author seems to be mocking. Postcards are trivial compared to the real thing—to nature. *Tone: mocking, ridiculing*

Paragraph 11: *real world, flow of life . . .* The author reveals his values. *Tone: impassioned, reverent*

Paragraph 12: value is not determined by what they will *ring up on the cash register of the gross national product*. The author suggests that those who think of nature in economic terms have misplaced values. *Tone: ridiculing*

### Getting at the Matter (page 10)

These questions can be assigned for homework and discussed in class the next day. Possible answers.

1. The main idea of the reading is that human activities are causing major damage to the world's eco-systems and biological diversity, and it is up to current generations to do something to protect the environment and the various species that cohabit the earth. The author contends that we need to ensure that all species are protected because of the symbiotic relationship between all species that share the Earth. Furthermore, this protection should not be merely for our own aesthetic pleasure, but for the mutual benefit of all organisms. He concludes by saying that man is only a small part of existence on this planet, and we need to understand that the Earth is not ours alone to do with as we wish. We share it with the other species and must ensure that all species have the same right to exist.
2. The author provides the following evidence to support the claim that we are in a time of crisis: We are experiencing one of the highest extinction rates of species and it will only get worse in the future, and our actions are affecting the climate, the oceans, the ozone layer, and the atmosphere.
3. The author believes that humans are a part of nature and should not exploit it solely for their own benefit. The ethical principle underlying the author's position is stated in the last sentence of the reading where he quotes Aldo Leopold, who suggested that any action that preserves the integrity, stability and beauty of the biotic community is ethical.
4. According to the author, wilderness is the real world, the flow of life, the process of evolution, the repository of that three and a half billion years of shared travel.” (Paragraph 11). The students' definitions will vary, but ideally should include the recognition that wilderness refers to an untamed area that is free or nearly free from human impact or control.
5. The writer rejects ideas for preserving wilderness that are based solely on human benefit. The author feels that we need to save the wilderness just because it is. Wilderness has inherent worth.

## Academic Vocabulary Focus (page 11)

Part 1 of this activity can be done as a scanning activity in class. Parts 2 and 3 can be assigned for homework.

diversity (Par. 1)	ethical (Par. 15)	extraction (Par. 10)	inherent (Par. 12)	integrity (Par. 16)
insight (Par. 8)	intrinsic (Par. 12)	manipulation (Par. 13)	perceive (Par. 7)	philosophy (Par. 6)
ratio (Par. 3)	register (Par. 12)	sole (Par. 7)	terminal (Par. 10)	unprecedented (Par. 1)

## For Discussion (page 13)

You can either assign this as a writing assignment for homework or have the students get into groups and discuss their responses orally in class.

## Reading 2: "Information Overload"

### Pre-Reading (page 14)

The pre-reading requires students to come up with definitions for toxic chemicals and biotechnology and to express their beliefs about both. The questions can be assigned for homework, or students can be given several minutes to answer them in class. Once the students have answered the two questions, have them share their definitions and beliefs with other students in pairs or small groups. If the assignment is given for homework, a good idea is to ask the students to do a little research on the two topics and bring in recent articles to share with the class.

### The Reading (pages 15–22)

After students have had an opportunity to discuss the **Pre-Reading** questions, go over the introduction to the reading with the students. Paragraph 2 makes the point that environmental hot topics sometimes change from year to year. The hot topics when Callahan was assembling her book seemed to be toxic chemicals and biotechnology. Ask students what environmental topics currently seem to be receiving the most media attention.

As students prepare to read the selection, have them recall the main points as well as the tone of the previous reading, "In Time of Crisis." Encourage them in reading "Information Overload" to pay attention not only to what Callahan has to say but also to how she says it. Ask them to try to determine the overall tone of the reading. (The tone of this reading is quite different from that of "In Time of Crisis." Foreman's tone is impassioned, alarmed, angry, and at times contemptuous. In contrast, Callahan adopts a more objective, restrained, and skeptical tone. Her primary message is that many environmental claims are exaggerated, and she repeatedly asserts that there is considerable uncertainty in our knowledge of the possible harmfulness of toxic chemicals in the environment and biotechnology, two topics that occupy her attention in "Information Overload.")

## Getting at the Matter (page 23)

Suggested answers:

1. According to Callahan, the reason it is so hard to evaluate the risks is that less than 5 percent of medical students have had any environmental training and scientific studies have yielded contradictory conclusions.
2. Readers might tend to find the 1977 study more credible. There are two factors that the reader might be inclined to be suspicious about. The sponsor of the 1999 study seems to be General Electric. It is unclear who conducted the first study in 1977. The 1999 study looked at a population of 7,000. The 1977 study looked at 25,000. Concerns: (1) A study by General Electric finding that exposure to PCBs in the workplace did not lead to an increase in cancers might arouse the reader to at least question the objectivity of a study by a company with a vested interest in the outcome. (2) All other factors being equal, we are generally inclined to give more credence to the study that has the larger population, and the 1977 study population was 3.5 times larger. Of course, Callahan simply does not give enough information for us to really evaluate the two studies.
3. Consumers are increasingly concerned about the safety of genetically modified products. Moreover, genetic modification has become symbolic of environmental issues in general.

## Critical Focus Detecting Bias in a Text (pages 24–25)

Ask students to read this section. Then go over the advice and make sure students understand the example. Then ask them to try the application exercises.

## Critical Focus: Application (page 26)

This task is best done in-class where you can offer guidance. The first item is the one presented in the **Critical Focus** Box that precedes the exercises. If students have difficulty, work through one or two more examples before having students work through the remaining exercises on their own with a partner or in a group. If necessary, work collaboratively as a whole class through all of the examples. Lack of vocabulary can be an impediment in this activity. If so, just consider it a guided exercise in the building of vocabulary and idiomatic expression.

Suggested Answers.

Group or Individual	Tone	Bias	Language that Indicates Bias
News Media	Tone: Negative	Bias: Against	Language that Indicates Bias: The author suggests that the news media forces unpleasant and unwanted information on the public, scaring them needlessly. This is evident from the use of the following phrases “news is negative and never ending,” “information piped directly,” “courtesy of the news media,” and “constant barrage of doom” (Par. 2).
Government/Industries	Tone: Neutral	Bias: For	Language that Indicates Bias: The author seems to give government and industry the benefit of the doubt (“no government conspiracy,” Par. 5). They are portrayed as usually acting in the public interest (“... have spent millions of dollars cleaning up,” Par. 6). When they do “endanger lives” she excuses them for “underestimating risk” (Par. 7). She concludes the paragraph with the phrase “clear evidence is lacking,” which seems to suggest that she does not seem to think they are doing anything wrong or purposeful.
Biotech Industry	Tone: Neutral	Bias: For	Language that Indicates Bias: She predicts that people’s fear of biotechnology will be like earlier concerns with irradiated food and fluoridated drinking water; people will discover that they are not really dangerous (Par. 13). The author is critical of those who criticize biotechnology. She states that biotechnology is “an important field, with great potential benefits as well as risks for agriculture” and doesn’t want to “dwell on politics and silliness” (Par. 17).
Ben & Jerry’s	Tone: Neutral to somewhat negative	Bias: Objective to somewhat against	Language that Indicates Bias: The author gives the impression that the warning labels on Ben and Jerry’s products do not make sense. “A generation ago, even a biochemist would have scratched her head at the statement on the carton” (Par. 10).
Organic Food Industry	Tone: Negative	Bias: Somewhat against	Language that Indicates Bias: Some negative bias seems evident from her statement that “the ‘organic’ food industry and its customer base have come a long way since the 1960s when health food dealers got away with outrageous claims” (Par. 11). The use of quotation marks around “organic” suggests that she questions the concept.

Patricia Dines	Tone: Neutral      Bias: Objective Language that Indicates Bias: While the term <i>activist</i> can have positive or negative connotations, the author seems simply to be reporting Patricia Dines' opinion. She even expresses some sympathy toward Dines and others who express concern. "These and similar objections are hard to ignore" (Par. 16).
Britain's Prince Charles	Tone: Neutral      Bias: Against Language that indicates Bias: Prince Charles is characterized as among "opponents" that have made "outlandish" claims. She dismisses Prince Charles' "accusation" that biotech firms are "playing God." She defends the biotech firms by saying they are only doing what businesses do—"just trying to make a profit from their research investment" (Par. 16).
Greenpeace	Tone: Negative      Bias: Against Language that Indicates Bias: An attitude of strong disapproval is implied. Words and phrases that help indicate this are <i>invade</i> and <i>dump it with grand flourish</i> (Par. 16).

### Critical Focus: Evaluating the Credibility of Text (page 28)

Make sure students understand the meaning of the word *credibility*. Explore the questions: How does an individual establish credibility? How does an individual lose credibility? Invite students to name different kinds of texts (for instance, encyclopedia, email, newspaper, popular magazine, professional journal, textbook, blog, web page). Have students offer their opinions on the relative credibility of these various sources. Then have students read the **Critical Focus** box.

### Critical Focus: Application (page 30)

Direct students' attention to the references that follow "Information Overload." Ask them to determine the types of sources represented and discuss in small groups their judgments of the credibility of "Information Overload" based on its references. (One would expect a book with the title *Recent Advances and Issues in Environmental Science* to rely on scientific sources rather than news media reports; therefore, students might rightly question the credibility of "Information Overload.")

### Academic Vocabulary Focus (page 30)

This activity can be assigned for homework and checked in class the following day. The words *compounding* and *underestimating* are particularly tricky in this reading because each is a verb in a reduced adverb clause. It may be necessary to point this out to the student and explain that the verb + *-ing* form can sometimes be a gerund that functions like a noun, a participle functioning as an adjective, or a present participle.

In this sentence from the reading, there is an example of each: *The resulting fear, denial, and apathy may hamper effective environmental planning, thus compounding the original problems.* The word *resulting* is a participle functioning as an adjective; *planning* is a gerund, and *compounding* is a present participle.

## Part 1

compounding (Par. 3) verb	consensus (Par. 17) noun	consultant (Par. 16) noun	contracting (Par. 5) noun	corporate (Par. 15) noun
denial (Par. 3) noun	enhanced (Par. 15) adjective	environment (Par. 4) noun	evidence (Par. 5) noun	exposure (Par. 6) noun
policy (Par. 16) noun	potential (Par. 14) adjective	scenario (Par. 8) noun	site (Par. 7) noun	underestimating (Par. 7) verb

## Part 2

1. environment
2. exposure
3. corporate
4. denial
5. potential
6. underestimating
7. policy
8. consensus
9. compounding
10. evidence

### For Discussion (page 32)

While the questions are intended for oral discussion, they could also be given as writing assignments.

## Reading 3: North Atlantic Right Whales in Crisis

### Pre-Reading (page 33)

An endangered species is a population of plants or animals that is at risk of becoming extinct because its numbers are declining, usually due to loss of habitat or predation.

This pre-reading activity is designed to get students to begin thinking about endangered species and what can or is being done to protect these species. Students can either work alone or in small groups

to answer the questions and fill in the chart. Once the questions and charts are completed, you can have students write their answers on the board to compare which species the students feel it is important to protect and to ask why other species were not included on their lists. If it becomes apparent after students get started that only a few students seem know anything about the topic, you can quickly shift to a whole-class discussion format and simply record on the board the suggestions of students who seem to have some knowledge of the topic.

### The Reading (pages 34–38)

Most students who have attended at least one year of college or university have had some exposure to citations in academic reading; however, other students may never have seen them or may not be aware of their purpose. In either case, since this is the first reading in this book that utilizes in-text parenthetical citations, a good place to start is to call students’ attention to the numbers in parentheses and have students speculate about what they mean. Once you get students to realize that they are in-text citations, you may want to skip to the references and have students notice the connections between citations and references. Point out the Author’s Note following the references. Its purpose is to help students decipher the abbreviated journal titles that appear in the reference list.

This is a highly detailed article loaded with quantitative reasoning, and students will undoubtedly need to read it several times. To encourage multiple readings, you can have students do a first reading in class and discuss in a small group what they understood. Then assign the reading as homework along with **Getting at the Matter**. At the next class meeting have students discuss their answers to **Getting at the Matter**.

### Critical Focus: Making Use of Citations and References (page 39)

Go over the **Critical Focus** material. Highlight the two main points. The material is a reminder that references can be used to evaluate the credibility of a text. Second, citations and references are tools for locating additional sources related to a given question or topic.

### Critical Focus: Application (page 40)

Suggested answers:

1. Judged strictly according to the types of sources cited, “North Atlantic Right Whales in Crisis” is a much more credible article than “Information Overload.” The majority of sources cited in “Whales” appear to be from scientific peer-reviewed journals (while the majority of references in “Overload” are from news media sources.)
- 2.

Citation	Issue Discussed	Author(s)	Date	Source
1	right whale population and reproduction rate	Kraus, Hamilton, Kenney, Knowlton, Slay	2001	<i>Journal of Cetacean Research and Management. Spec. Issue 2</i>

<b>Citation</b>	<b>Issue Discussed</b>	<b>Author(s)</b>	<b>Date</b>	<b>Source</b>
2	Whaling has brought right whale close to extinction	Reeves	2001	<i>Journal of Cetacean Research and Management. Spec. Issue 2</i>
3	right whale population and reproduction rate	Caswell, Fujiwara, Brault	1999	<i>Proceedings from the National Academy of Sciences. 96</i>
4	right whale population and reproduction rate	Fujiwara, Caswell	2001	<i>Nature, 414</i>
5	right whale mortality	Knowlton, Kraus	2001	<i>Journal of Cetacean Research and Management. Spec. Issue 2</i>
6	Southern hemisphere right whale population and growth rate	Best, Brandao, Butterworth	2001	<i>Journal of Cetacean Research and Management. Spec. Issue 2</i>
7	right whale mortality	Moore, Knowlton, Kraus, McLellan, Bonde	2005	<i>Journal of Cetacean Research and Management. 6 (3)</i>
8	right whale mortality rate and population loss	Fujiwara (This is a dissertation)	2002	<i>Massachusetts Institute of Technology–Woods Hole Oceanographic Institution</i>
9	Fishing regulations	U.S. Environmental Protection Agency	N/A	<i>U.S. Code of Federal Regulation. 50, Part 229.32</i>
10	Protection of other species	James, Ottensmeyer, Myers	2005	<i>Ecology Letters. 8</i>
11	Regulations to reduce right whale strikes by ships	U.S. Environmental Protection Agency	June 1, 2004	<i>Federal Registry. 69 (105), 30857</i>

You may also want to mention to the students that *Science Journal* does not require titles of articles in the reference. However, we have included them here in case you would like to provide them to your students for further research or discussion.

Titles for the articles references on page 38:

1. “Reproductive parameters of the North Atlantic right whale”
2. “Overview of catch history, historic abundance and distribution of right whales in the western North Atlantic and in Cintra Bay, West Africa.”
3. “Declining survival probability threatens the North Atlantic right whale”
4. “Demography of the endangered North Atlantic right whale”
5. “Mortality and serious injury of northern right whales (*Eubalaena glacialis*) in the western North Atlantic Ocean”
6. “Demographic parameters of southern right whales off South Africa”
7. “Summer distribution of harbour porpoise (*Phocoena phocoena*) in the German North and Baltic Sea”
8. “Mark capture statistics and demographic analysis”
9. “Taking of marine mammals incidental to commercial fishing operations; Atlantic large whale take reduction plan regulations”
10. “Identification of high-use habitat and threats to leatherback sea turtles in northern waters: new directions for conservation”
11. “Endangered fish and wildlife; advance notice of proposed rulemaking (ANPR) for right whale ship strike reduction”

### Getting at the Matter (page 42)

Suggested answers:

1. North Atlantic Right Whales were brought close to extinction in the early 20<sup>th</sup> century after 1,000 years of whaling. They have been protected from commercial whaling since 1935, but populations have not fully recovered.
2. The whale population growth rate has declined since 1980.
3. Low reproductive rate, collisions with ships, and entanglements in fishing gear.
4. To prevent ship strikes: mandatory ship location reporting, extensive aerial survey efforts, and mariner education. To prevent fishing gear entanglement: selective area closures and gear modifications.
5. Reduce speeds and reroute commercial and military ships. Eliminate or minimize amount of fixed fishing gear in the water column.

### Academic Vocabulary Focus (pages 42–43)

<b>AWL</b>	<b>Synonym</b>	<b>Synonym</b>
alternative (Par. 7)	different	unconventional
decline (Par. 1)	go down	refuse
decline (Par. 5, 6)	weakening	reduction
diminishing (Par. 1)	decreasing	withdrawing
impact (Par. 5)	collision	effect

(Continued)

<b>AWL</b>	<b>Synonym</b>	<b>Synonym</b>
eliminated (Par. 7)	dislodged	removed
ensure (Par. 6)	make certain	guarantee
hypothetical (Par. 5)	imaginary	supposed
implementation (Par. 7, 8)	utilization	realization
implies (Par. 3)	involves	suggests
inadequate (Par. 6)	insufficient	laughable
induced (Par. 6, 7)	caused	persuaded
migratory (Par. 6)	changeable	traveling
potential (Par. 2)	possibility	aptitude
range (Par. 3)	travel freely	variation
unidentifiable (Par. 4)	unrecognizable	unknown

### For Discussion (page 43)

While the questions are intended for oral discussion, they can also be used as writing assignments.