

**Problem-Solving in Conservation Biology and Wildlife
Management EXERCISES FOR CLASS, FIELD,
AND LABORATORY**

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This PDF is a study companion to the first edition of the book, and it is provided here for archival purposes. For a more up-to-date version of exercises and other resources, please visit the [Supporting Materials site for the second edition of this book](#).

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Introduction

EXERCISE 1. NATURAL RESOURCE MANAGEMENT AND CONSERVATION BIOLOGY

Below are the website addresses for the two umbrella organizations of the fields of conservation biology and wildlife management. They have many other useful links.

- [Society for Conservation Biology](#)
- [The Wildlife Society](#)

EXERCISE 2. CONSERVATION VALUES

Below is a useful summary of Americans' attitudes and opinions about "biodiversity," review of which can greatly enhance this exercise:

Special Report on BIODIVERSITY AND AMERICAN PUBLIC OPINION from the Liberty Tree Alliance (This resource is no longer available.)

EXERCISE 3. REGIONAL BIODIVERSITY

Internet links useful for completing this exercise.

ASSESSING ECOSYSTEM DIVERSITY

- Regional Natural Heritage programs (This resource is no longer available.)
- The Ecological Land Classification System of Canada (This resource is no longer available.)
- [The U.S. Forest Service's latest version of Bailey's classification](#)
- [The U.S. Government's system for wetland classification](#)
- For species lists for U.S. National Parks that may be located near you: <http://www.ice.ucdavis.edu/nps/>
- Directions for obtaining the Noss et al. (1995) report: <http://biology.usgs.gov/pubs/ecosys.htm>

ASSESSING SPECIES DIVERSITY

- [The World Conservation Union "Red Data List" of endangered species](#)
- For the U.S., lists of extinct and endangered species organized by region and by state can be found at [U.S. Fish and Wildlife Service's Endangered Species Program website](#).
- Heritage Program offices have other lists of rare species in the Americas (This resource is no longer available.)
- For Canada, a complete endangered species list is available at: http://www.registrelep-sararegistry.gc.ca/species/default_e.cfm
- For Australia, a list of rare and endangered animals is available at: <http://www.ea.gov.au/biodiversity/threatened/>

CONSERVATION INITIATIVES IN YOUR AREA

For a starting point, consult the [Center for Conservation Biology Network](#).

OTHER RESOURCES

Other useful sites include an extensive list of environmental advocacy groups active in the U.S. and elsewhere:

The [National Wildlife Federation](#) also can provide direction on regional biodiversity issues.

Populations

EXERCISE 4. POPULATION VIABILITY ANALYSIS

Some useful Internet links and resources, as well as the Java applet bandigraph needed for this exercise.

If you are not able to access this applet through your browser, you will need have Java installed or enabled in your browser. Fragment applet © Stephen J. Phillips

The Bandcoot (bandigraph) Applet can be found in interactive.html, located at the same directory as this PDF.

This program is needed to complete the exercise. It is a Java applet that will run in any Java enabled browser on any platform. Once you have accessed the applet, follow directions given in the book.

A commercial provider of useful PVA software can be found at:
<http://www.ramas.com/software.htm>

Note that the entire Volume 73, Issue 2, 1995, of *Biological Conservation* was a Special Issue: "Applications of Population Viability Analysis to Biodiversity Conservation" with many useful articles.

EXERCISE 5. LIFE TABLE ANALYSIS

Internet sites with software useful for life table analysis are listed below.

Freeware useful for survival and population estimation can be found at:
<http://www.im.nbs.gov/software.html> (This resource is no longer available.)

A commercial provider with useful life table software:
<http://www.ramas.com/software.htm>

EXERCISE 6. HARVESTING POPULATIONS

Below the source of the Populus software, whose Logistic Population Growth submodule is useful for envisioning the basic concepts behind sustainable harvest theory:

Populus Software, available from the Illinois Natural History Survey:
<http://www.cbs.umn.edu/populus/>

EXERCISE 7. ECOLOGICAL MONITORING

Below is the Internet site where the MONITOR software can be downloaded and the address for the NBS Office of Inventory and Monitoring, which is a fountain of information on ecological monitoring.

To download the MONITOR software:
www.im.nbs.gov/powcase/monitor.html#Download (This resource is no longer available.)

To visit the Office of Inventory and Monitoring: www.im.nbs.gov (This resource is no longer available.)

EXERCISE 8. HABITAT LOSS AND FRAGMENTATION

To access the fragment applet to run this exercise, click on the link below. This Java applet will run in any Java enabled browser on any platform, and is needed to complete the exercise. Once you have accessed the applet, follow directions given in the book. If you are not able to access this applet you will need to install or enable Java in your browser. Fragment applet © Stephen J. Phillips

The Fragment applet can be found in interactive.html, located at the same directory as this PDF.

EXERCISE 9. DISPERSAL

To access the disperse Java applet click on link below. The software will run in any Java enabled browser on any platform and is needed to complete the exercise. Once you have accessed the applet, follow directions given in the book.

If you are not able to access this applet you will need to install or enable Java on your browser. Fragment applet © Stephen J. Phillips

The Dispersal applet can be found in interactive.html, located at the same directory as this PDF.

EXERCISE 10. POPULATION GENETICS

This exercise provides a brief introduction to the field of Conservation Genetics; those

with further curiosity about the field should consult the website below.

See: <http://gslc.genetics.utah.edu>

EXERCISE 11. GENETIC DRIFT

Below is listed the source of the Populus software, whose "Genetic Drift" module and "Monte Carlo Model" submodule are needed to complete parts of this exercise:

Populus Software, available from the Illinois Natural History Survey:
<http://www.cbs.umn.edu/populus/>

Species

EXERCISE 12. TAXONOMY AND CONSERVATION

For an interesting extension of this exercise, the taxonomic and conservation status of many species around the world can be examined by consulting the website listed below. You could essentially repeat the exercise in the text by considering a real archipelago and examining a real taxonomic group, such as reptiles on the Galapagos Islands, and ranking them accordingly.

[The World Conservation Monitoring Centre](http://www.wcmc.org.uk/species/data/species.html)

<http://www.wcmc.org.uk/species/data/species.html> (This resources is no longer available.)

EXERCISE 13. NATURAL HISTORY STUDY

A list of many Habitat Suitability Index models useful to consult as examples for this exercise is provided below:

HSI model list:

http://www.mesc.usgs.gov/hsi/HSI_models_available.html (This resources is no longer available.)

EXERCISE 14. DESIGNING A ZOO

Below are listed two resources useful for completing this exercise:

- [The World Conservation Monitoring Centre's](http://www.wcmc.org.uk/species/data/species.html) list of the conservation status of the world's species (This resources is no longer available.)
- For more information about the International Species Information System (ISIS), see: <http://www.isis.org>

EXERCISE 15. EXOTIC SPECIES

To examine some specific exotics and their impacts on native communities, see:

- [Story of Kudzu](#)
- An overview of Purple loosestrife and its impacts (This resource is no longer available.)
- [The zebra mussel](#)

EXERCISE 16. PLANT REINTRODUCTIONS

To contact a plant conservation organizations actively using reintroduction techniques, see below.

Center For Plant Conservation:

<http://www.mobot.org/CPC/>

Ecosystems

EXERCISE 17. GAP ANALYSIS

Listed below is the Internet source of the OSUMAP software needed for this exercise.

To download OSUMAP, Contact James P. Gibbs to obtain a copy of OSUMAP.EXE

For a comprehensive list of websites describing specific gap analysis projects, see: <http://userzweb.lightspeed.net/~jpthomas/sgap.html> (This resources is no longer available.)

CORRECTIONS TO EXERCISE 17

Bottom of page 121, for "renu areas a 0 t 0 th 10 a 1 to 10 th 100 f habitat <enter>"
substitute
 "1000" for "100" to read "renu areas a 0 t 0 th 10 a 1 to 10 th 1000 f habitat <enter>"

Page 122, under Establish a protective buffer..., the second line,
 "renu buffer a 0 t 4 buffer" should read "renu buffer a 0 t 4 a 1 t 1 th 3 f buffer"

Page 122, under Assess existing protection, in the text "54" should be "47".

EXERCISE 18. ISLAND BIOGEOGRAPHY

The U.S. National Park Service website with species lists for each park is given below.

Access the NPFAUNA or NPFLORA databases at:
<http://www.ice.ucdavis.edu/nps/>

EXERCISE 19. FOREST HARVESTING

For a useful compilation of information on forestry and wildlife interactions, see below.

Forestry and wildlife interactions:
http://www.rr.ualberta.ca/wildlife_impacts/log1.htm (This resources is no longer available.)

EXERCISE 20. EDGE EFFECTS

An extensive list of literature about the effects of habitat edges on birds, useful for interpreting your results, is given below.

See: <http://www.ag.iastate.edu/centers/cfwru/edgerefs.htm> (This resources is no longer available.)

EXERCISE 21. ECOLOGICAL SURVEYS

Below is described a field station in the Adirondack Mountains of New York where a course in ecological survey methods, patterned after this text chapter, is offered. Information on the course or how it is structured can be obtained by contacting the station.

The Cranberry Lake Biological Station:
<http://www.esf.edu/clbs/>

EXERCISE 22. RESTORATION ECOLOGY

Some useful websites for restoration ecologists are listed below.

The Society for Ecological Restoration's website:
<http://www.ser.org/>

EXERCISE 23. LAND USE PLANNING

Below are listed some Internet resources useful for completing this exercise.

RESOURCES TO ASSIST MAPPING YOUR AREA

- To obtain baseline maps in the US:
<http://egsc.usgs.gov/isb/pubs/MapProjections/projections.html>
- To obtain aerial photographs, and related items in the US:

<http://www.usgs.gov/pubprod/aerial.html>

- For information on vegetation mapping systems:
<http://www.wcmc.org.uk/index.html> (This resource is no longer available.)
- For information specifically on wetland classification, see:
<http://www.fws.gov/wetlands/Data/wetlandcodes.html>
- For information on soils maps (in this case in Michigan), see:
<http://www.mi.nrcs.usda.gov>
- State Natural Heritage Programs can be contacted through:
<http://www.abi.org> (This resource is no longer available.)

RESOURCES FOR DETERMINING THE CONSERVATION STATUS OF PARTICULAR SPECIES

- The World Conservation Union "Red Data List" of endangered species:
<http://www.iucnredlist.org/>
- For the U.S., lists of extinct and endangered species organized by region and by state can be found at: <http://endangered.fws.gov/wildlife.html>
- Heritage Program offices have other lists of rare species in the Americas:
<http://www.heritage.tnc.org> (This resource is no longer available.); or
<http://www.abi.org> (This resource is no longer available.)
- For Canada, a complete endangered species list is available at:
http://www.registrelep-sararegistry.gc.ca/species/default_e.cfm
- For Australia, a list of rare and endangered animals is available at:
<http://www.ea.gov.au/biodiversity/threatened/>

EXERCISE 24. OVERPOPULATION AND OVERCONSUMPTION

CONSUMPTION QUESTIONNAIRE

1. Do you take your own bag(s) to the store?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)
2. If not, do you use **paper (2 points)** or **unrecyclable plastic (3 points)** bags for your purchases?
3. When given the choice, do you choose unrecyclable **plastic bottles (3 points)**, **glass bottles (0 points)** or **aluminum cans (1 point)** for your beverages?
4. Do you drive to places that you could otherwise get to by public transportation, biking or walking?

Always	Sometimes	Rarely	Never
(3 points)	(2 points)	(1 point)	(0 points)

5. When you wash your dishes, do you:
Let water run as you wash?
Always (3 points) **Sometimes (2 points)** **Rarely (1 point)** **Never (0 points)**
as you rinse?
Always (3 points) **Sometimes (2 points)** **Rarely (1 point)** **Never (0 points)**
6. Do you eat in fast-food restaurants?
Always (3 points) **Sometimes (2 points)** **Rarely (1 point)** **Never (0 points)**
7. Do you buy foods that are locally grown?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
8. Do you use phosphate-free detergents?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
9. How often do you use non-rechargeable batteries?
Always (3 points) **Sometimes (2 points)** **Rarely (1 point)** **Never (0 points)**
10. Do you recycle
paper?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
aluminum?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
glass?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
11. Do you subscribe to a newspaper? If so, how often do you read it?
Always (0 points) **Sometimes (1 point)** **Rarely (2 points)** **Never (3 points)**
12. Do you buy books new?
Always (3 points) **Sometimes (2 points)** **Rarely (1 point)** **Never (0 points)**

or take them out of the library?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

13. Do you buy clothing new?

Always	Sometimes	Rarely	Never
(3 points)	(2 points)	(1 point)	(0 points)

14. Do you buy used clothing or get hand-me-downs?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

15. Do you turn the lights off when you exit an empty room?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

16. Do you eat meat?

Regularly	Sometimes	Rarely	Never
(3 points)	(2 points)	(1 point)	(0 points)

17. Do you use compact fluorescent bulbs (energy-efficient) for your lights?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

18. Do you water your plants with "gray water" (water from rinsing dishes, etc.)?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

19. Do you select items from the store that have less packaging and buy in bulk when possible?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

20. Do you use and/or buy recycled materials when possible?

Always	Sometimes	Rarely	Never
(0 points)	(1 point)	(2 points)	(3 points)

21. Do you buy products such as disposable razors, disposable lighters, paper cups, or paper plates?

Always	Sometimes	Rarely	Never
(3 points)	(2 points)	(1 point)	(0 points)

RESOURCES

Below are listed some useful Internet resources for completing this exercise.

- [The U.S. population clock](#)

- [The world population clock](#)
- [Population pyramids for selected countries](#)
- [Shifts in population composition](#)

EXERCISE 25. ADVERSARIAL PROCEEDINGS

To find ways to provide testimony in public forums, it is best to carefully read your local papers. More efficient, perhaps, is to contact local environmental groups who can quickly orient you to opportunities to testify.

The National Wildlife Federation provides mechanisms for alerting to citizens to important, pending environmental legislation and actions. See: <http://www.nwf.org>

EXERCISE 26. AN INTERNATIONAL DEBATE

Below are listed some useful Internet sites related to this exercise.

- [The Galapagos Coalition](#)
- To understand how a World Heritage Committee works, see: <http://whc.unesco.org/>
- To learn more about your country, go to the [Encyclopedia Britannica Online](#)
- Updates on the actual situation in the Galapagos can be found at: <http://www.darwinfoundation.org/>

EXERCISE 27. CONSERVATION POLICY

The best way to find out what is "going on" in your region and where you can provide some input is to contact your local environmental advocacy groups. They will be able to quickly orient you to opportunities for providing comments.

A fairly extensive list of environmental advocacy groups active in the U.S. can be found at: <http://www.envirosw.com/advocacy.html> (This resource is no longer available.) These groups can also put you in contact with smaller, more locally focused groups specific to your area.

The National Wildlife Federation can provide direction on pending U.S. biodiversity issues: <http://www.nwf.org>

The Federal Register is a good source for identifying opportunities to comment on Government environmental actions. For example, consult the U.S. EPA digest of the Federal Register on endangered species issues, for which the U.S. Fish and Wildlife Service solicits written comments on various Recovery Plans each month: <http://www.epa.gov/docs/fedrgstr/EPA-SPECIES/>