

Natural Resource Conservation and Policy

**The Stone Age came to an end,
but not because we ran out of stones.*

— Sheikh Yamani, former OPEC oil minister

**Conservation, viewed in its entirety, is the slow and
laborious unfolding of a new relationship between people
and land.* —Aldo Leopold,
Wisconsin Wildlife Chronology (1940)

*If we draw on the resources in our **minds**,
we won't have to rely on resources that we **mine**.*

—Stan Oshinsky, Inventor

**Tell me the landscape from which you come,
and I will tell you who you are.*

— Jose Ortega y Gasset

**The king who cannot take good care of the mountain, forest,
lake and meadow, will not be able to rule the nation.*

—Guan Zhong (645 BC)

**A nation deprived of its liberty may win it, a nation divided
may unite, but a nation whose natural resources are
destroyed must inevitably pay the penalty of poverty,
degradation, and decay.*

—Gifford Pinchot, founder, U.S. Forest Service

**Despite our artistic pretensions,
sophistication and accomplishments—
we still owe our existence*

to a six-inch layer of topsoil and the fact that it rains.

—Chinese Proverb

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Josie is studying for her masters in natural resource management. She will lead a Leopold discussion group and grade the quizzes and the reading summaries.

Course Description:

The course examines the conservation of natural resources, including its history and ecological, economic and social foundations. First we discuss the basic principles of resource management including sustained yield, ecology, conflict resolution, and the effects of world population growth. With this foundation, we take a more detailed look at the management of specific resources, including agriculture, forestry, wildlife, fisheries, and recreation management, then fossil fuels and renewable energy.

The course attempts to take the LONG view. Many of our resource problems have been caused because people put short-term interests over their own best interests over the long run. In addition to that, the history of natural resource management is a key part of the last 10,000 years of human history. NRM began when we “stopped chasing our food and started growing it,” —Gary Snyder. All of civilization is based on natural resource management. NRM has greatly increased the carrying capacity of the Earth for humans, but often at the expense of many other species. Throughout its history, NRM has put people first and short-term over long-term goals. Human ingenuity is remarkably good at adjusting to new information, and we will start changing this.

The course also takes a GLOBAL view. Since the days of the spice trade, natural resource management has had global implications. Now there are so many humans on the planet that we are having global impacts. Again, human ingenuity will hopefully come to the rescue to reduce these.

Themes

Natural resource conservation is about supplying what humans need while trying to minimize the impacts of this on the environment.

Natural resource conservation has enormously increased the carrying capacity of the Earth for humans.

Much of natural resource management has involved domesticating the plants, trees, mammals, birds and fish that humans favor. There is a spectrum of domestication, from plants and animals that cannot live without human assistance to plants and animals that survive with little or no assistance from us.

We have faced famines and serious environmental impacts in the past and thus far, human ingenuity has always saved the day. History shows that some people sound an alarm, declaring that a catastrophe is within sight. Then others put great effort into solving the problem, and the catastrophe is averted. Life has gotten better and better in terms of human life expectancy, child mortality and education.

Most resources are limited in supply and/or growth rates, but the ability of humans to learn and adapt seems virtually unlimited. This is good, because we are always facing new problems and challenges and the best minds are needed to overcome them.

The Goal of Resource Conservation:

“To learn to live on a piece of land without spoiling it.”

—Aldo Leopold

Resource conservation is about survival—survival of both our planet and ourselves. Over the long-term, human welfare and environmental quality are inseparable. Resource conservation is about working *with* nature to provide what we need while trying to minimize our impact on the environment. We cannot “lock up” *all* of Earth’s natural resources. People are consumers—when we stop using the Earth’s bounty, we die. We must try to limit our population and to stop consuming far

more than we need. But even if we succeed in doing so, the remaining humans will still need food, water and shelter. We will still need to obtain everything we require from the Earth. And as Leopold said, we must learn to do so without spoiling the very source of our livelihood.

Required Texts and an iClicker required:

For those of you on a tight budget, copies of both texts will be on reserve in the Bioscience Library and the main library and an eBook is available online for the first text.

1) Natural Resource Conservation: *Management for a Sustainable Future*, 9th or 10th Edition by Daniel D. Chiras; John P. Reganold,. This book provides vital background and supplementary information that we don't have time to cover in lecture: You can order a hardcopy at <http://www.UAFText2U.com>

You can also buy an "eBook subscription" of this book for \$66.33. It gives you online access for 180 days. Go to http://www.coursesmart.com/givecoursesmartatry?xmlid=9780321682598&_instructor=2207693

2) A Sand County Almanac by Aldo Leopold. We will read and discuss this book in detail in discussion groups. Please get the Oxford 1987 Edition ordered for this class. Other editions have different essays! Copies of this book can be obtained online and some will be available at the campus bookstore. This book is not available as an eBook.

3) iClickers. We will be using iClickers in this class and the use of these will count for up to 200 pts of the participation grade. Get the clickers from Debbie Gonzalez in Room 110C Arctic Health, across the street from Elvey Bldg, between 9 and 5, closed for lunch. **Clickers must be purchased by Sept 15 at 5 pm.** They cost \$30, of which \$25 is a deposit.

Additional required and optional readings will be available on Blackboard, the online resource for this class at <http://classes.uaf.edu/>. See the course schedule on the last page of the syllabus for due dates.

Course Objectives:

Upon completion of this course, the student should:

- Recognize that the history of resource management is one of turning an increasing amount of the world's biomass into humans and the things humans want and need.
- It is also a history of increasing domestication. We started with grass seeds, then other plants, some livestock, trees, and finally fish.
- Recognize our total dependence on natural resources and our own *personal* impacts on them. All of us "live off the land," though for most of us, this link is so remote that we are no longer aware of it. *All* of us are consumptive users of the environment and reducing impacts must begin on a personal level.
- Recognize the complexity of our resource problems; that there are often no simple answers and there is no free lunch—*all* decisions have consequences.
- Recognize the importance of our philosophy in determining both the types of environmental problems we

are likely to confront and the types of solutions we are willing to consider.

- Recognize that *everything is connected*. Resources are not separate entities, but communities of living, interacting organisms and their abiotic environments.
- Recognize that both optimistic and pessimistic perceptions play important roles in our survival. Pessimists sound the alarm about problems and optimists go to work to solve them. We need both.
- Be able to explain what sustained yield is and why it is important in resource management.
- Consider both human needs and the needs of ecosystems.
- Know where much of our food, shelter and clothing comes from and understand the ancient history of these products.
- Be able to tolerate, and even appreciate, diverse viewpoints.
- Recognize that few disciplines are more controversial than resource management—and few are more important.
- Recognize that in today's world, most issues and impacts are global.
- Know the Three Principles of Sustainable Resource Mgmt:
 1. Reduce dependence on non-renewable, non-recyclable materials, as these will run out.
 2. Harvest renewable resources no faster than they can be renewed, or they will also run out.
 3. Produce wastes no faster than nature can absorb or break them down, or we will poison our environment—and ultimately, ourselves.

Learning Disabilities:

If you have a learning disability that may interfere with your ability to perform the work in this course, I am happy to make any necessary accommodations. However, it is the student's responsibility to obtain an Accommodation Letter from the Disabilities Office of the Health Center (ext.6158). This letter **MUST** be presented to Dr. Todd **within the first two weeks** of class. No accommodations will be made until this letter is given to the professor. Accommodations will NOT be made retroactively (i.e. if you have a spelling disability, you must present the letter **before** any points are deducted for spelling).

ATTENDANCE

Research has shown that students who attend classes do much better and are much more likely to graduate. The US has dropped from 1st to 12th in the number of students who start college and actually manage to finish, so professors are urged to take attendance, as this has been shown to increase graduation rates. Also, you may be a brilliant student, but if you are not reliable, employers want to know that. They feel this should be reflected in grades, and I agree. Therefore, I will give credit for attendance through the iClickers.

TAKE NOTES

Research also makes it clear that students who take notes do better in classes and again, are more likely to graduate. Note

taking helps keep your mind from wandering, it helps you concentrate on the class.

Conduct in Class

COMPUTERS ARE NOT ALLOWED. Computers distract other students and are therefore not allowed.

Guest Speakers are Volunteers—please be considerate! Most speakers are nervous about speaking to a group this large. They spend considerable time putting together a talk they hope you will like. Please show them—and your fellow students—the respect they deserve. Good audience behavior enhances the reputation of the University and our ability to attract speakers who are at the cutting edge of their fields.

- Do NOT put books away or zip backpacks until class is over (i.e. NOT ONE MINUTE BEFORE 11:30).

- If you arrive LATE, please sit in the back.

- If you MUST leave early, please sit in the back and depart quietly.

- Feet belong on the floor, not up in a speaker's face.

- If other students are disturbing or distracting you, please let me know.

Email: include a subject & your name

If you send an email to me or to the TA, please put “**NRM 101**” and your name at the start of the subject line. Most faculty get 100-200 messages/day, many of which are spam.

If you want us to read your email, **ALWAYS include a subject and your name**. Otherwise, it could to be considered spam and be deleted.

Only those with active UAF accounts are allowed to use our “online classroom” called Blackboard. Your UAF email account will be created automatically. If you have any questions about email or Blackboard, contact the Computing Help Desk at helpdesk@alaska.edu.

Blackboard

We use the online course center called “Blackboard” (abbreviated BB) for many things in this class. It allows us to post copyrighted material (since only those with a password can access it), most of the gradebook is kept online, and you can access lecture notes, announcements, handouts, etc. It will also be the place to take quizzes and submit some assignments.

Go to <http://classes.uaf.edu/> and log in using your UA username (eg. sktodd). Don't know it? Go to: https://uaonline.alaska.edu/banprod/owa/bwgk2gid.P_DisplayID_Request.

First time users of BB should use their student ID number without any dashes as their password. Once logged in, you can change your password by going to “TOOLS” and then to “PERSONAL INFORMATION” where you can click on “CHANGE PASSWORD.”

Grading Policy

Zeros play havoc with the total number of points received in the semester. Each year, 15% of the students in this course receive an F, and inevitably they have several zeros on the grade sheet. This is NOT a difficult course—unless you fail to do the work. It is always better to turn in something rather than taking a zero. Grades will be based on the percentage of points earned in the course.

Graded Assignment	# Points
Make a Homepage profile on Blackboard	30
19 Online Quizzes on the readings and lectures (30 pts each)	570
Turn in your notes on 4 videos shown in class (20 pts each)	80
Attend 3 Leopold Discussions at 50 pts each	150
Attend 2 Commons Game Sessions at 50 pts each	100
Write 3 papers on Leopold's A Sand County Almanac at 100 pts each	300
Summary of "Predator Fish" + "Should we eat 100-year-old fish?" + the conclusion from the book <i>Four Fish</i>	100
Two tests at 300 each	600
Final Exam	450
Participation, 100 pts each: a) iClicker responses, b) lecture response cards, c) full and timely participation in all parts of the course.	300
Correct iClicker responses (to avoid wild guessing, you'll get points for getting the right answers)	100
Total Points	2780

Extra Credit: Up to 150 points extra for the Entry Quiz	150
Extra Credit: Up to 50 points extra for summary of the “Salmon” chapter from <i>Four Fish</i>	50
Extra Credit: Provide written proof that you had an NRM job interview scheduled through the NRM Career Day. Must have signature & business card of your interviewer.	75

Anyone who has less than 51% of the points possible after the first test will be withdrawn from the course. You will be sent an email if this is the case.

A – Exceptional – The work is of “*professional*” quality, demonstrating originality, independence, and a thorough mastery of the subject matter. This not only means fulfilling the requirements, but doing it in a way that *goes beyond* the basic expectations of the assignment.

B – Very Good – Work does not have all the *refinements* that could give it real polish, but also didn’t have any significant problems. Work is accomplished on time and presented neatly and thoroughly but does not have the depth and originality for an “A.”

C – Acceptable – The work fulfills the *minimum* requirements with only a few notable errors. The student grasps the essential information; but work is not consistently thorough and does not demonstrate mastery. BTW, if this course is required for your major, you must get a C or better (even a C- is not adequate).

D – Unacceptable – The work demonstrates a lack of understanding of the fundamental nature of the assignment or material.

F – Complete lack of understanding of the fundamentals of the course.

Academic Honesty:

The UAF [Student Code of Conduct](#) requires that collaboration among students will not be allowed on essays, tests, exams and online quizzes. Copying or paraphrasing another student's writing is a violation of the Student Code. Evidence of academic dishonesty (either copying anyone else’s work or allowing someone to copy yours) will be presented to the Director of Judicial Services and may result in an F for the course and possible expulsion from the University.

Editing and Spelling MATTERS...

One point will be deducted for each spelling error on each written assignment except tests. If you have trouble spelling, ask the Writing Center or a friend to proofread your papers. The Writing Center on 8th Floor Gruening has trained staff who will proofread your paper for FREE. Save points by taking your paper there before turning it in. If your first paper loses many points for grammar and spelling, your section instructor will require that you take your last two papers to the Writing Center.

Jobs in natural resources, wildlife and fisheries are highly competitive. The first contact most applicants make with potential employers is through their cover letters and resumes. **Would an employer spend 30 minutes reading a poorly written letter, when she could read a well-written one in just three minutes?** An ability to write so that others can easily understand it is essential to finding a job in this field.

NOTE: ALWAYS keep a copy of graded & ungraded written assignments (in all classes) in case one gets lost or your grade was recorded incorrectly.

LATE PAPERS:

The Sand County Almanac Papers and the fisheries summary will be turned in **AT THE END OF CLASS on the DATE DUE**. It is far easier to keep track of papers if they are all collected in class at the same time. To encourage everyone to turn them in on time and to reward those who do, the following points will be deducted from late papers.

Points Deducted for Late Papers:	
Papers submitted outside my office (349 O’Neill) after 1 p.m. but before 5 pm on the day it is due.	— 20 %
Papers submitted after 5 pm on FRIDAY, but before class the following Monday.	— 30 %
Papers after this without a note from a doctor or other responsible party.	— ALL points

Tests & Final Exam

There will be two tests and one comprehensive final exam. Each of these will include about 30 true/false questions, several multiple choice and a few short answer questions. Dates for tests and the exam are given on the attached course schedule.

Questions on Test Scores

An opportunity for students to discuss questions regarding a test score will be provided, subject to the following guidelines. Please do **not** discuss the score after class. I can be surrounded by a dozen students pleading for points and this isn't fair to any of us. Instead, do the following:

Write the number of the question on the back of the test and explain why you feel you deserve more points for it, then turn it in.

I will look these over and correct any problems. When you get your corrected test back, if you still have concerns, please make an appointment to discuss it with me. However, an appointment to discuss a particular test must be made within one week after I have checked it. Do NOT wait until the end of the semester to bring such problems to my attention.

No Early Final Exams

Early final exams are not allowed (an airline ticket is not an excuse for missing the final exam). However, if you have 3-4 exams in one day, provide

proof and if possible, we will allow you to take the final exam at a different time.

Don't Miss a Test!

Missed Test Policy

If you are delayed for any reason, remember that arriving late to a test is preferable to missing it altogether.

This policy is an effort to be fair to those who did take the test on time and who have complained in the past that they, too, would have liked extra time to study (or sleep, etc...).

Sports Teams. If you are on a team that requires you to miss a test, you must have an excuse signed by your coach and make arrangements with me to take the test as soon as you return.

Other reasons. Legitimate problems do happen, but sleeping through the test, getting caught in a blizzard that mysteriously occurred only at your house, being detained by aliens, etc. do NOT constitute reasons to take the test another day!

Illness. Anyone absent due to *severe* illness must write me an email as soon as possible (preferably before the quiz) and make it up as soon as possible.

Other. Any other excuse must be signed by the Dean of Students—preferably *before* the test, but at the latest during or before the next class period following the test.

NO OTHER EXCUSE WILL BE ACCEPTED

Approaches to Management: A Prologue by Kenneth Boulding

A Conservationist's Lament

The world is finite, resources are scarce,
Things are bad and will be worse,
Coal is burned and gas exploded,
Forests cut and soils eroded.
Wells are dry and air's polluted,
Dust is blowing, trees uprooted.
Oil is going, ores depleted,
Drains receive what is excreted.
Land is sinking, seas are rising,
Man is far too enterprising.
Fire will rage with Man to fan it,
Soon we'll have a plundered planet.
People breed like fertile rabbits,
People have disgusting habits!

Moral: The evolutionary plan
went astray by evolving Man.

The Technologist's Reply

Man's potential is quite terrific,
You *can't* go back to the Neolithic!
The cream is there for us to skim it,
Knowledge is power, and the sky's the limit!
Every mouth has hands to feed it,
Food is found where people need it.
All we need is found in granite,
Once we have the men to plan it.
Yeast and algae give us meat,
Soil is almost obsolete.
Men can grow the pastures greener,
Till all the Earth is Pasadena.

Moral: Man's a nuisance, Man's a crackpot
But only Man can hit the jackpot.

1. Thoreau tried growing a bean patch, but he felt guilty destroying weeds and fighting woodchucks. He concluded that farming should be condemned as discrimination against innocents. Thereafter, he obtained his beans from his mother's garden.
2. A timber harvesting protest is held in lovely *log* home; dozens of flyers printed on *paper*, protesters hold *paper* placards on *wooden* stakes. Are they aware of the paradox?
3. New Alaskan: "You know, when I came to Alaska from Baltimore, I was totally opposed to cutting trees. But since I got here, I've realized something. I—well, I *like wood!*"
4. A man who condemns any manipulation of nature by resource management agencies sees porcupines in his own garden and yells: "I'm going to *firebomb* those devils! "
5. Leslie: "My mother always bought chicken drumsticks in packages of four. As a result, my sister was 12 years old before she discovered that chickens don't have four legs."
6. A Native woman describes how she was sad when she caught a mother lynx with two kittens on her 50-mile trapline. The kits would surely die. Asked how she dealt with that, she said, "Well I know that someday it will be my turn. It's like they say, 'First the salmon feed me, then I feed the salmon.'"

TENTATIVE SCHEDULE

wk	dy	DATE	TOPIC	READINGS DUE	WRITTEN ASSIGNMENTS
0	F	3-Sep	Course Logistics, Requirements & Themes.		
1	M	6-Sep	LABOR DAY — NO CLASS		Complete Entry Quiz on Blackboard for up to 150 points extra credit. Must be completed by 5 pm on Sep 10
	W	8-Sep	Essential terminology.	Read Chapters 1 and 2 in Chiras.	
	F	10-Sep	Example of my own work: Fortymile Wolf Mgmt Plan	Read Richard Nelson, "The Gifts" & Jack London, "To Build a Fire", find them on Blackboard (BB)	Complete your homepage on Blackboard by 9 am Sep 13.
			Annual NRM PICNIC at the UAF Farm--all NRM 101 students invited. Directions to farm (just south of class) are on BB. We provide the food, just bring yourselves.		
2	M	13-Sep	Discuss "To Build a Fire" and "Gifts." Discuss Environmental Ethics	READ Sand County Almanac (SCA), Pgs vii to xxviii and pages 1-18.	Complete Quiz on Ch 1 & 2 of Chiras on Blackboard.
	W	15-Sep	Ecosystem vs. Resource Mgmt & Pillars of NRM	Read SCA, pages 19-40	Take Terminology Quiz on BB
	F	17-Sep	Two "Sides" of Conservation: John Muir and Gifford Pinchot	Read SCA, pages 41 - 62	Turn in your notes on John Muir & Gifford Pinchot video—due in class
3	M	20-Sep	The Legacy of Aldo Leopold	Read SCA, pages 62 - 92, Start working on SCA paper, due Oct 8.	
	W	22-Sep	Resource Demand: The Population Challenge	READ Chiras Ch.4: Population	Take History Quiz on BB
	F	24-Sep	Resource Supply: Principles of Ecology	READ Chiras Ch.3: Lessons from Ecology	Take Population Quiz on BB
4	M	27-Sep	NRM Impacts: Extinction	READ Chiras Ch.15: Extinction	Take Ecology Quiz on BB
	W	29-Sep	NRM Impacts: Ecosystem Services	Read Ecosystem Services handout on BB	Take Extinction Quiz on BB
	F	1-Oct	Commons Game in GREAT HALL, RASMUSON LIBRARY. ATTENDANCE WILL BE TAKEN		
5	M	4-Oct	Commons Game in GREAT HALL, RASMUSON LIBRARY. ATTENDANCE WILL BE TAKEN		
	W	6-Oct	Commons Discussion--ELVEY AUDITORIUM	Read SCA, pages 95-116	
	F	8-Oct	1st LEOPOLD DISCUSSION GROUP	DISCUSS Part 1 of SCA, Pgs 1 to 92	Sand County Paper on Part 1 DUE in Class
6	M	11-Oct	Tragedy of the Commons: video "Taking Stock" on the Collapse of the Newfoundland Cod Fishery	Read SCA, pages 117-137	Turn in your notes on "Taking Stock" video in class

	W	13-Oct	Resource Supply: Sustained Yield & Sustainability	Read SCA, pages 137-162, begin work on 2nd SCA Paper	Take Common Property Quiz on BB
	F	15-Oct	Resource Supply: Sustained Yield & Sustainability		Take Sustained Yield Quiz on BB
7	M	18-Oct	TEST 1		
	W	20-Oct	Soils: The Foundation of Terrestrial Ecosystems	Chiras Ch.6: Nature of Soils & "Soil Biodiversity" on BB Watch "Nitrogen as a Resource" on BB	
	F	22-Oct	2nd LEOPOLD DISCUSSION GROUP	DISCUSS Part 2 of SCA, Pages 95 through 162	Sand County Paper on Part 2 DUE in Class
8	M	25-Oct	AGRICULTURE —or— 9 Billion People are Coming for Dinner!	Read SCA, pages 165 - 194	Take Soils/Nitrogen Quiz on BB
	W	27-Oct	NRM Employer Panel—meet at Wood Center Ballroom	Read SCA, pages 194 - 226	EXTRA CREDIT for going to a job interview at the Job Fair
	F	29-Oct	Agriculture	READ Chiras Ch. 5: Hunger & Ch.7: Agriculture	Take Agriculture Quiz on BB
9	M	1-Nov	TBA		
	W	3-Nov	Forestry & Silviculture	Read Chiras Ch.14: Forest Mgmt	
	F	5-Nov	3rd LEOPOLD DISCUSSION GROUP	DISCUSS Part 3 of SCA, Pages 165 - 226.	Sand County Paper on Part 3 DUE in Class
10	M	8-Nov	Forestry & Silviculture	Review Shade Tolerance Handout & Forest Products Flowchart on BB	
	W	10-Nov	Film: Fire Wars		Turn in your notes on Fire Wars Video in class
	F	12-Nov	Wildland Fire Management		Take Forestry Quiz on BB
11	M	15-Nov	Wildlife Management, Kris Hundertmark	Read Chiras, Ch. 16: Wildlife Management	Take Wildlife Quiz on BB
	W	17-Nov	Rangeland Management	Read Chiras Ch.13: Rangeland Mgmt and "Where Bison Once Roamed" on BB	Take Rangeland Quiz on BB
	F	19-Nov	TEST 2		
12	M	22-Nov	Watershed Management	Required: Read "Conclusion" of <i>Four Fish</i> , pages 243-256	Take Watershed Quiz on BB
	W	24-Nov	Ocean Acidification, Jeremy Mathis	Read "Ninety Percent of Predator Fish Gone" and "Should We Eat 100-Year-Old Fish?" on BB	Submit 2-3 pg summary of 1) "Predator Fish" + 2) "100 year old Fish" + 3) "Conclusion" Chap from <i>Four Fish</i> .
	F	26-Nov	THANKSGIVING BREAK		
13	M	29-Nov	Fisheries Management, Dr. Amanda Rosenberger	Read Chiras Ch.12: Fisheries.	Optional: Submit Summary of "Salmon" chap from <i>Four Fish</i> on BB for extra credit. Must be submitted by 9 am Nov 29.
	W	1-Dec	Fisheries Video: Empty Oceans, Empty Nets		Take Fisheries Quiz on BB Turn in your notes in class on Empty Oceans.
	F	3-Dec	Renewable Energy	Read Chiras Ch.23: Sustainable Energy	
14	M	6-Dec	Fossil Fuels	Read Chiras Ch.22: Nonrenewable Energy	Take Renewable Energy Quiz on BB
	W	8-Dec	Global Warming & NRM	Read Chiras Ch.19: Global Warming	Take Fossil Fuels Quiz on BB
	F	10-Dec	TBA		Take Global Warming Quiz on BB
	F	17-Dec	FINAL EXAM , FRI 10:15 to 12:15 a.m. Elvey Auditorium. NOTE: EARLY EXAMS ARE NOT AN OPTION		