Syllabus

Dr. Tom Langen: tlangen@clarkson.edu, phone 268-7933
Dr. Rick Welsh: welshjr@clarkson.edu, phone 268-3988

OPEN OFFICE HOURS: 10:00 – 11:30 Tu & Thu or by appointment in Science Center 163 (Langen)
12:00-2:30 Tu & Thu or by appointment in 270 Snell Hall (Welsh)
MEETINGS: MWF @ 9:00 – 9:50 AM (section 1), 10:00 – 10:50 AM (section 2) in ERC111. On weeks that we have a guest lecturer (see schedule, below), Friday class will be canceled.


COURSE OBJECTIVES: One important way that governments, businesses, and NGOs analyze complex technological and social problems is by forming task-force groups. The groups are comprised of individuals with diverse skills and interests, who are asked to analyze the many facets of a problem and then provide a consensus document on their findings. The document, often referred to as a white paper, is designed to objectively inform the reader about the problem, and then make some considered recommendations about policy or directions of further study.

Your task will be to work in a group of 4-5 individuals to produce a white paper on the A2A corridor initiative. Your group will have to analyze both the scientific argument for of the A2A (is it really scientifically justifiable?) and the socio-political argument for it (is it feasible & desirable, given the political, social and economic realities of the region?)

We have five objectives for this honors course: You will (1) Learn some fundamental principles of conservation biology and sustainable agriculture. (2) Develop your skills at evaluating diverse sources of information (written texts, oral interviews) to produce a considered opinion about a complex problem. (3) Hone your skills at collaboratively working in a group toward a common goal. (4) Learn how to write an objective but thought-provoking white paper which will be useful to decision makers and concerned citizens. (5) Acquire an understanding of the challenges that are faced when trying to develop landscape-level plans for sustainable land use in the Adirondack – St. Lawrence Valley – Algonquin Region, and how the lessons learned here might be profitable applied in other regions of North America.

There are three components of the course:

(1) LECTURES (Mon): Lectures will provide the conceptual background for the topic.

(2) DISCUSSIONS (Wed): Discussions will be based on the assigned readings for the week. We will use different models for conducting discussions, so be prepared for the unexpected! One of us will assess your participation, using the following rubric: 3 = exceptional, thoughtful participation, 2 = average participation, 1 = little or no participation, 0 = not present. Note that we are interested in the quality of your participation (what you have to contribute) and NOT the quantity (how much you contribute).

You will also have to turn in a 1 – 2 page type-written report on the readings and course progress, due at the beginning of Wed. class. Minimally this report will include (a) a paragraph or two that summarizes the major theme connecting the assigned readings for that week (what was the take-home message or “bottom line” of the week’s assigned readings?), (b) a paragraph on your opinion of the readings, and (c) a paragraph of ‘journal’ reflections on what you have learned and thought about in the past week relevant to the course. This can include reflections on the lectures, readings, outside research, discussions within your work group or with peers, problems of group work etc. No class members will see these reflections except the instructors.

Grading of the reflections will be as follows: 3 = detailed, informative, well-written report, 2 = fair but lacking in detail, incomplete or poorly written, 1 = poor – lacking in detail, incomplete and poorly written, 0 = not turned in.

(3) GUEST LECTURES & INTERVIEWS (TBA): Almost every week we will have a speaker, who will provide some perspective relevant to the questions we are addressing in this course. We plan to have the guest speakers give their talks to both sections at 4 pm on Thursdays unless this time is inconvenient for the class members. You will be expected to attend all talks and take notes, which can be incorporated into your white paper. One
team (one sole task group, not one from each section), will also be assigned to interview each guest. It will have to develop a structured list of questions (incorporating input from the whole class), and dictate the answers. A transcript will be provided to both sections as a reference.

Grading of the interview transcript will be as follows: 3 = well structured and informative interview, 2 = adequate interview but could have been improved by better questioning, 1 = poor – lacking in focused, structured questions, or poorly written transcript, 0 = not turned in. All group members receive the same grade.

(4) WHITE PAPER: The white paper will be written as a collective effort of the task group. The minimum length is 20 pages of text in the main body (excluding title page, bibliography etc.). Formatting is double spaced, 12 point font, 1 inch margins.

Each paper must include (a) a background section on the A2A initiative, (b) a section analyzing the scientific justification of the project, (c) a section analyzing the social, economic and political impacts of the project, and (d) a section of conclusions and recommendations. Remember, this is meant to be an analytical but thought provoking and interesting piece. You may conclude that there is not enough information to make an informed recommendation about the desirability and feasibility of the A2A. If so, you need to suggest what kind of information should be gathered to make an informed decision. We encourage use of bulleted lists, liberal use of subheadings and other ways to make the report readable. Use some of the white papers we provide as a model.

You will be asked to provide a rough draft on week 13. We will return the papers with comments the next week. The final draft is due Wednesday of finals week. Each of the instructors will independently grade the papers on a scale of 0 – 100, basing ¾ on content and ¼ on structure of the white paper. To detect ‘free-riders’, we will ask each of you to assess the relative efforts of all group members. For example, in a group of 5, if in your judgment everyone contributed equally, then each would be credited with 20% effort. If one person did the lions-share, you might credit that person with 80% and the other four with 5% effort each. We will use the median score of all of the group members’ rankings to assign grades. Your grade on the white paper will be the overall (group grade), weighted by your participation as judged by members of your work group. Thus someone who works less than other group members will be penalized, someone who works relatively more will be rewarded.

The final paper will be posted on the web, and a set of print copies of all reports will be distributed to our guest speakers. You have the opportunity to make a significant contribution to the debate on an important, controversial policy issue – the usefulness of your contribution will be determined by the care and effort that you and other group members take in making your report.

GRADING: Your grade will be based on the following breakdown: 75% for the white paper, 15% for the weekly written reports, 10% for the Discussions and Interviews. Course grades will be based on a percentage of the total normalized score: 90% or greater = A, 87-89% = B+, 80-86% = B, 77-79% = C+, 70%-76% = C, 67-69% = D+, 60-66% = D, 59% or less = F. However, We reserve the right to curve down (lower the grade cutoffs) if we judge it warranted.

COURSE ASSESSMENT: We will be performing an assessment of the course as an aspect of our own research. We will distribute a short pre-course test, an end-of-course test, and a follow-up test at a later date. We are interested in tracking how your content knowledge and opinions change as a consequence of this course, and we also would like to collect some demographic data to characterize the ‘population’ taking this course. The exams will be coded so that your performance is anonymous, and therefore will not be used in calculating your grade. Indeed, we will not look at the pre-course test or end-of-course test until after the grades have been assigned. We will also use your final white paper and copies of your weekly reports in the analysis. Please let us know if you have any concerns or reservations about this. However, in order to track pre and post test scores you will place your birth-date and middle initial on the tests. This way we cannot identify you but we can discern how individuals scored on pre- and post-tests.

FINAL POINT: The schedule may be modified during the semester. Readings & the schedule of speakers may be altered, depending on contingencies. For example, Dr. Langen will become a father sometime in October, which may cause some disruption to the schedule.
**Curriculum of HP 302:**

*An A2A (Adirondack to Algonquin) Corridor: Functional and Feasible?*

Although the entire course will incorporate biological and social science content, roughly the first half of the course will primarily deal with the science of conservation biology in the context of biodiversity preservation through the use of parks and other protected areas— including biodiversity corridors. The second half of the course will primarily focus on the socioeconomic aspects of the problem of establishing biodiversity corridors in a human-dominated landscape by setting aside land or introducing restrictive land-use regulation. The conservation biology and socioeconomic sections will be organized into five modules each. The modules will vary in length depending on the number of issues to be covered within each.

**CONSERVATION BIOLOGY MODULES (Led by Tom Langen)**

**Module 1: Environmental History of the Adirondack & Algonquin Regions.**
An understanding of the biogeography of the area, and how the landscape has been formed by natural processes and human activities, is essential for understanding the present-day condition of the region. In this module, the students will learn about the pre-European natural communities of the region, and how these communities were altered with the arrival of extractive industries (e.g. lumbering), farming settlements, and tourism. Present-day conditions will be compared to those of the past, and future scenarios will be discussed. This will set the stage for the principal question of the next four modules: *Is it scientifically feasible to restore and manage a portion of the region as an intact ecosystem—an ecosystem in which all necessary components are present in approximately their natural abundances?*

**Module 2: Biology of Small Populations.**
Small populations are particularly vulnerable to extinction. From the perspective of population dynamics, small populations can be at risk because of demographic stochasticity (random variation in survival and reproduction) and environmental stochasticity (random variation in environmental conditions that affect vital rates). From the perspective of population genetics, small populations can be at risk because of a loss of genetic diversity, which may lead to reduced survival and fecundity in the short term, and reduced capacity to evolve in response to environmental change in the long term. In this module, students will learn why small populations are at risk, and how conservation biologists go about estimating whether a population (or species) is ‘big-enough’ that its persistence is assured by applying analytical mathematical models and by running computer simulations (called Population Viability Analysis). This module will help students understand why large areas of habitat may be needed to maintain viable populations of moose, wolves, lynx, and other large animals of the Adirondack—Algonquin region.

**Module 3: Species Interactions in Disturbed Communities.**
A significant alteration of the abundance of one species (e.g. its extinction, or population explosion) will affect others—those it feeds upon, those that feed upon it, those that compete with it for resources etc. Sometimes such changes can result in a dramatic cascade of effects through a natural community, whereas in other cases it will only have a modest effect. In this module, the students will learn why it is difficult to predict the consequences of species extinctions or species introductions, but how some reasonable generalizations can be made. As a result of this module, students should understand why conservation biologists often advocate restoring large predators to ecosystems such as wolf and lynx to the Adirondacks, and why they actively discourage the introduction and spread of exotic species such as by game fish stocking practices or accidental transfer of zebra mussels and European milfoil by boat traffic.

**Module 4: Habitat Alteration, Loss, & Fragmentation.**
A root cause of declining ecosystem integrity is (1) habitat alteration such as declining tree cover because of acid rain or eutrophication of surface waters due to seepage of human and farm animal wastes, (2) habitat loss such as by deforestation and wetland drainage, and (3) habitat fragmentation such as by construction of artificial barriers like roads and dams. In this module, students will examine how alteration of the landscape by these processes can result in small, fragmented populations of species, making them at high risk of extinction. Furthermore, entire communities become altered, because of the loss of some species and the invasion of new ones that are more suited to the altered conditions. At the boundaries of natural communities with human-dominated landscapes (agricultural or residential areas), disturbances become especially severe because of altered microclimatic conditions and hydrology, and increased frequency of disturbance by humans and invasive species. As a result of this module, students should
understand why some aspects of the current management practices of the Adirondack Park and other protected areas in the region are laudable as ways of preserving ecosystem integrity, and why some aspects are quite bad.

**Module 5: Principles of Biodiversity Reserve Design.**
A new paradigm for biodiversity conservation through nature reserves has come to dominate field of conservation biology and environmentally-concerned land management, which takes into account the problems associated with small population sizes of species, alterations in natural community membership, and the consequences of habitat alteration, fragmentation, and loss. Instead of trying to maintain biodiversity by creating a number of isolated, protected parks, situated like islands surrounded by a sea of unregulated land-use, the current ideal is to surround parks by buffer zones of regulated land-uses that have less extreme impact on the ecosystem within the parks, and to link parks by corridors that facilitate movement of organisms between them. Ideal parks should be large, have configurations that minimize borders with other land-uses, and should be near enough to other parks that functional corridors can be maintained. It is this paradigm that is the impetus for the A2A proposal. As a result of this module, students should clearly understand the scientific justification for creating reserve networks, and the problems that can result from poorly designed reserve systems, and thus should be able to critically think about whether the A2A initiative is justifiable on scientific grounds.

**SOCIOECONOMIC MODULES (Led by Rick Welsh)**

**Module 1: Economic valuation of nature, natural areas and biological diversity.**
Students will read papers and texts on the tools economists use to calculate values for non-market goods. The material will focus on the general applications of these tools, as well as specific case examples of attempts to place values on relevant non-market goods such as wild areas. Discussions will emphasize the efficacy and appropriateness of the techniques.

**Module 2: Land use issues**
The establishment of the A2A corridor will almost certainly necessitate the evaluation of current farming practices by private landowners engaged in agriculture. The use of pesticides and the nutrient loading from concentrated animal feeding operations (CAFOs) have a history of detrimental impacts on wildlife and natural areas. Some of the techniques developed to address pesticide impacts have been organic systems, integrated crop and pest management systems and the introduction of particular types of transgenic crops. Nutrient loading from animal manure has become more important as the agriculture industry consolidates into larger operations both on and off the farm. Students will read and discuss material on structural change in the agricultural industry, pesticide use issues, organic production, transgenic production and issues surrounding the shift toward fewer larger livestock operations.

**Module 4: Issues of land ownership**
The acquisition of land by conservation groups as well as governments is not sufficient to meet the public’s needs for biodiversity preservation and recreation in natural areas. Therefore it is imperative to induce private landowners to merge their acquisition of private benefits from the use of their land with public needs. Material in this module exposes students to land ownership as an evolving concept determined by social dynamics and relations. Property rights issues will be presented and discussed with a focus on how issues around public and private property potentially impact the setting aside of protected areas such as the establishment of biodiversity corridors. This module will also cover the use of conservation easements as a potential tool for protecting land for future generations, while also allowing the owner to retain property rights.

**Module 3 Politics of ecosystem management**
Ecosystem management is not only based in biology but also in political and social change. Debates over the management of natural or wild areas revolve around the most appropriate framework, model or paradigm to be employed as a management guide. Part of this debate is the perceived relative need to reorient our scientific and government institutions toward an ecological sustainability framework and away from sustained multiple use framework. In addition, there are questions about whether community, or citizen, needs and participation should be the driving force behind managing a natural area; or whether a detached and objective science-based approach is more beneficial in the long run. Readings and discussions in this module cover these issues and others including the development of effective government regulations and policy for sound ecosystem, or wild area, management.
Module 5: Eco-tourism as a sustainable development strategy
Eco-tourism is often held up as a potential model for reconciling biodiversity preservation and economic development of rural areas. Many conservation organizations have expended significant resources in order to convince governments, communities and property owners that positive economic outcomes can be obtained from natural resources through tourism rather than extraction. In this module, students will read material that defines, promotes and critiques eco-tourism as a vehicle for rural and regional economic development. In addition, students will read and discuss material regarding the conditions under which eco-tourism is most and least effective.
## SCHEDULE

| Week 1       | Aug 27   | Environmental History of the Adirondack & Algonquin Regions |
|             | 29       | How to interview, and why?                                  |
|             | 31       | Recitation & Discussion. Of Readings                       |
| Week 2      | Sept. 3  | Lecture: Biology of Small Populations                      |
|             | 5        | Recitation & Discussion. Of Readings                       |
|             | 7        | Speaker: Tom Jasikoff, Regional Director, US Fish & Wildlife Service |
| Week 3      | 10       | Species Interactions in Disturbed Communities              |
|             | 12       | Recitation & Discussion. Of Readings                       |
|             | 14       | Speaker: Jean Langlois, Canadian Parks & Wilderness Society |
| Week 4      | 17       | Habitat Alteration, Loss, & Fragmentation                  |
|             | 19       | Recitation & Discussion. Of Readings                       |
|             | 20       | Speaker: Robert Inslerman, Region 5 Wildlife Manager, NYSDEC |
| Week 5      | 24       | Principles of Biodiversity Reserve Design                  |
|             | 26       | Recitation & Discussion. Of Readings                       |
|             | 28       | Speaker: Norman Ruttan, Superintendent, Thousand Islands National Park (Canada) |
| Week 6      | Oct. 3   | Corridors as a Conservation Strategy                      |
|             | 5        | Recitation & Discussion. Of Readings                       |
| Week 7      | 8        | Conservation Biology and the A2A Corridor                 |
|             | 10       | Recitation & Discussion. Of Readings                       |
|             | 11       | Speaker: Graham Cox, New York Audubon Society              |
| Week 8      | 15       | Estimating the Value(s) of Biodiversity Corridors          |
|             | 17       | Recitation & Discussion. Of Readings                       |
|             | 19       | Speaker: William Vitek, Environmental Science & Policy, Clarkson University |
| Week 9      | 22       | Structure of Agriculture & Pesticides                      |
|             | 24       | Recitation & Discussion. Of Readings                       |
|             | 26       | Speaker: Rebecca Rivers, Dept. of Environmental Studies, St. Lawrence University |
| Week 10     | 29       | Animal Agriculture                                         |
|             | 31       | Recitation & Discussion. Of Readings                       |
|             | Nov. 1   | Speaker: Jan Wojcik, Liberal Arts, Clarkson University     |
| Week 11     | 5        | Politics of Ecosystem Management                           |
|             | 7        | Recitation & Discussion. Of Readings                       |
|             | 9        | Speaker: Max Pfeffer, Dept of Rural Sociology, Cornell University |
| Week 12     | 12       | Issues in Land Ownership, Management & Acquisition        |
|             | 14       | Recitation & Discussion. Of Readings                       |
|             | 16       | Speaker: someone from Nature Conservancy                  |
| Week 13     | 19       | Group Work in Class                                        |
| Week 14     | 26       | Conservation Easements                                    |
|             | 28       | Recitation & Discussion. Of Readings                       |
|             | 30       | Speaker: open                                              |
| Week 15     | 3        | Ecotourism                                                 |
|             | 5        | Recitation & Discussion. Of Readings                       |
|             | 7        | Speaker: open                                              |
SCHEDULED READINGS

Week 1
(1) A. Leopold. *The Land Ethic*

Week 2
(2) AF Bennett (1999) Linkages in the Landscape: Part 1

Week 3
(1) RF Noss, AY Cooperrider (1994) Saving Natures Legacy: Chapters 1-3

Week 4
(1) RF Noss, AY Cooperrider (1994) Saving Natures Legacy: Chapters 4-6

Week 5
(1) RF Noss, AY Cooperrider (1994) Saving Natures Legacy: Chapters 8-10

Week 6
(1) AF Bennett (1999) Linkages in the Landscape: Part 2

Week 7
(1) AF Bennett (1999) Linkages in the Landscape: Part 3

Week 8
(2) A. Philips (1998) Economic Values of Protected Areas – Guidelines for Protected Area Managers

Week 9

Week 10
(5) TBA

Week 11

Week 12

Week 13

Week 14


Week 15

(5) TBA