A Student's Course Guide

for

BIO 488/588: Environmental Impact Analysis

Taught by

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Acknowledgments

Dr. Ronald C. Dilcher, Professor Emeritus of Biological Sciences, SUNY College at Brocport, and Mr. Albert Butkas, Region 8 Permit Administrator, Division of Regulatory Affairs, NYS Department of Environmental Conservation, have made invaluable contributions to the quality of this course over many years.

Introduction

Welcome

This Guide is designed to: 1) provide you with a central source of administrative and content information about BIO 488/588, Environmental Impact Analysis, and 2) help you study and produce effectively as you master the content presented in this course. By frequently consulting this guide and using it as a valued reference source, you will find course information and due dates for all important aspects and assignments of the course plus detailed outlines for most lectures.

Purpose

This course will teach you about principles of environmental analysis, how to prepare an environmental impact statement, how to sample and identify aquatic and terrestrial plants and animals, and ecological issues in the Great Lakes ecosystem. It is assumed that you have had at least one college-level ecology course or some background in general science before attempting this course.

Together with the other aquatic science courses offered at SUNY Brockport (Limnology, Population Biology, Fishery Techniques & Indentification, Fish Ecology, Aquatic Invertebrates, Pollution Biology, Water Quality Analysis, Hydrology, Groundwater Geology), this course will provide information useful to prepare for graduate study, professional employment, or state/ federal civil service examinations in environmental sciences. Students interested in pursuing a career in environmental science should speak to me about specialized graduate programs at other universities and professional employment opportunities in these fields.

Goals

It is my hope that at the end of this summer session you will understand the principles and procedures of environmental analysis sufficiently well so that you can: 1) perform biological field and lab work to prepare, then write, an environmental impact statement for an employer, and 2) participate as a knowledgeable citizen in your local community to deal effectively with development and other environmental issues. You should also understand some key environmental issues in the Great Lakes ecosystem.

Course Information

Meetings

Course: BIO 488/588: Environmental Impact Analysis
Semester: Summer 1998, Session IV, July 6 - August 6
Time: 9:00 am - 5:00 pm; Monday through Thursday
Place: 109 Lennon Hall

Office

Hours: During regular class time
Place: 109 Lennon Hall
Telephone: 716-395-5783
E-Mail: jhaynes@acspr1.acs.brockport.edu

I will be happy to discuss any aspect of the course or your performance with you briefly during or after class meetings. In particular, you should come to me as soon as you perceive that you may be having difficulty with any aspect of the course. Please bring your notebook and any other relevant course materials to our meetings.

Text

Bregman J.I., and K.M. Mackenthun. 1992. Environmental Impact Statements. Lewis Publishers, Inc. Boca Raton, FL. 279 p.

Reading assignments for each class meeting day are listed in the Syllabus below (e.g., B&M: 1-27) and should be completed before coming to class. The reading is quite straight-forward and provides good background material and checklists relevant to preparing EIS's.

Syllabus

Week 1

Mon, Jul 6
am: Introductions: Course, Participants, Environmental Analysis/NEPA
pm: Tour Project Area; Preliminary Scoping; Set Gill Nets
Assignment: This Course Guide, pp. 1-15; SEQRA/Permit Materials

Tue, Jul 7
am: Great Lakes Origins/Cultural/Environmental History; Pull Gill Nets
pm: Process Gill Nets; Electrofishing and Seining; Identify Fish
Assignment: B&M: 1-27, 199-205; SEQRA/Permit Materials

Wed, Jul 8
am: Plankton and Algae Collection
pm: Plankton and Algae Identification
Assignment: B&M: 47-61; SEQRA/Permit Materials

Thu, Jul 9
am: Critter Review; Quiz #1; EIA/EIS Procedures
pm: Regulatory Perspective: SEQRA, Impact Analysis, Permits, Scoping of the Class Project (Mr. Albert Butkas, NYSDEC)
Assignment: B&M: 29-34

Week 2 (taught by Dr. Ronald C. Dilcher)

Mon, Jul 13
am: Characteristics/Classification/Keys of Local Birds and Terrestrial/Aquatic Plants
pm: Terrestrial Macrophyte Sampling and Identification in the Field

Tue, Jul 14
am: Bird Sampling and Identification in the Field

pm: Aquatic Macrophyte Sampling and Identification in the Field

Wed, Jul 15

am: Bird Sampling and Identification in the Field

pm: Field Review of Aquatic/Terrestrial Macrophyte Identification

Thu, Jul 16

am: Wetland Ecology Lecture

pm: Lab Review of Bird and Aquatic/Terrestrial Plant Identifications; Quiz #2

Week 3

Mon, Jul 20

am: Assessing Environmental Impacts

pm: Teams Prepare Environmental Impact Assessment (EIA)

Assignment: B&M: 63-81

Tue, Jul 21

am: Teams Complete EIA; Make Positive or Negative Declaration

pm: Benthic Invertebrate Sampling and Processing

Assignment: B&M: 83-106

Wed, Jul 22

am: EIA/EIS Methodologies

pm: Benthic Invertebrate Identification

Assignment: B&M: 107-141

Thu, July 23

am: Benthic Invertebrate Identification; Quiz # 3

pm: Organize and Work on Team Special Projects

Assignment: B&M: 143-173

Week 4

Mon, Jul 27

am: Citizen Participation in EIA

pm: Teams Organize and Tabulate EIS Data

Assignment: B&M: 35-45; 173-196

Tue, Jul 28

am: Consultant Views on and Procedures for EIA/EIS

pm: Work on Team Special Projects

Assignment: B&M: 207-258

Wed, Jul 29

am: Great Lakes Pollution and Human Health

pm: Complete Team Special Projects and EIS Data Tabulation

Thu, Jul 30

am: Complete/Present Special Projects to Class

pm: The Great Lakes Fishery Ecosystem

Week 5

Mon, Aug 3

am/pm: Teams Begin Drafting EIS's

Tue, Aug 4
am/pm: Teams Complete Drafting EIS's
Wed, Aug 5
am: Teams Exchange and Critically Review Draft EIS's
pm: Permit Hearing Preparation and Delivery (Mr. Albert Butkas, NYSDEC)
Thu, Aug 6
am/pm: Teams Finalize and Hand-in EIS's at **4:00 pm**

Class Work

Class begins at 9:00 am, Mon - Thur, unless the instructor states otherwise for a particular day. Class will end as close to 5:00 pm as possible after we clean up following each day's activities. You will need a notebook to record field and lab observations and to jot down ideas about the environmental analysis you will do. Please keep in mind two additional points:

1. Equipment is expensive and difficult to replace on short notice. Accidents happen to the most careful of us, but please think and ask questions before you act impulsively or unknowledgably in the field or lab.

2. We will go into the field rain or shine, but schedules may change from the syllabus for a variety of reasons. Dress appropriately for field and lab work; this means have warm and cool clothing, hat, rain gear, sunscreen and bug repellent readily available each day. Remember that conditions near Lake Ontario are often cooler and windier than in Brockport.

A typical day will begin with a morning lecture/discussion on environmental impact analysis or Great Lakes ecology issues, followed by an afternoon of work in the field, in lab or on a student team activity. My formal lectures will use slides or the overhead transparencies reproduced at the end of this Guide. Field work will revolve around learning to sample and identify animals and plants and to develop species lists and relative abundance data for team EIS's. Laboratory work will focus on sample processing and organism identification. Guest experts on various phases of environmental analysis will also contribute to some morning or afternoon sessions. You are expected to ask questions on material you do not understand and to participate fully in class discussions of questions raised by me, guests or other students.

Material presented in lecture may or may not be highly correlated with assigned readings. We will discuss topics in class that are not covered in the readings and vice versa. You must be familiar with information from both sources to successfully complete this course. The emphases in the course will be on key concepts relevant to environmental analysis, procedures for preparing an environmental impact statement, field techniques, organism identification, and a team-approach to
problem-solving.

Studying

It is important that you study regularly during the short intervals between classes and

over weekends. Take notes on key points and processes discussed in readings and in class. Review and annotate your notes each evening after each class. This course covers much material quickly. If you do not understand something, see me. Do not fall behind!

I recommend that you use your EIS team as a study group to prepare for quizzes. Small study groups will help you to improve your performance no matter what your native ability is. Even students who understand the material well can reinforce and deepen their understanding by explaining and teaching concepts and techniques to others.

Attendance

College Policy: "The student is responsible for all assigned course work and can not be absolved of this responsibility. When enrolled in a particular course, the student is obligated to do all of the work assigned. Punctual and regular attendance is vital to the discharge of this obligation. Absences, excused or not, do not alter this responsibility. Absences will be excused for (a) documented illness, (b) official representation of the college, (c) death of a close relative, (d) religious holiday, and (e) other circumstances beyond the control of the student. Substantiation of excused absences is the responsibility of the student. Excuses for official representation of the college must be obtained from the official supervising that activity or event. Absences deemed excessive by the instructor may result in a lowered grade. Students whose unexcused absences exceed 15% of the scheduled classes and laboratories will be subject to failure at the instructor's discretion. Regulations more restrictive than those stated above, but not in conflict with them, may be established by the instructor for any course. Instructors are responsible for distributing this attendance policy, and any additions, in writing during the first class meeting".

My Policy: Because of the diversity and pace of the material presented, it is vital that you attend and be prepared to participate in each class meeting. In terms of this course, the 15% absentee limit described above translates into 3 class meetings. Thus, if you have 3 or more unexcused absences, you will earn an E in this course, regardless of your actual grades. A very important reason for your attendance is the dependence of your EIS team on your knowledge and effort. Don't let your team down.

In sum, you are expected to attend and participate in all class meetings, take quizzes and hand-in written assignments on the dates specified by me. Valid absences will be excused if you consult with me before an absence. Otherwise, I will require a valid written excuse (e.g., doctor's note) before you will be permitted to make-up a missed assignment. No exceptions.

Grading

Quizzes (3)	30%
EI Assessment	10%

Team Project	10%
Permit Hearing/Role Play	10%
EI Statement	40%

It is possible for you to earn a total of 200 points during the course (multiply the percentage value of each assignment by 2 to determine how many points it is worth). Your final letter grade for the course will be assigned according to the following percentage scale (divide the total number of points you earn by 2):

	Undergraduate	Graduate
A	90 - 100%	92 - 100%
B	80 - 89%	82 - 91%
C	70 - 79%	72 - 81%
D	60 - 69%	
E	0 - 59%	0 - 71%

Plusses and minuses will be awarded to students with final percentages near the upper or lower ends of these ranges, respectively. Graduate students can not earn D's at Brockport.

Tests

Quizzes will consist of short essay, definition and other questions designed to evaluate your understanding of and ability to use key concepts, ideas and processes discussed in lectures and your text. They will also cover field sampling techniques, laboratory methods and organism identifications. If you can answer competently the Study Questions presented later in this Guide, and identify the organisms we have sampled, you should have no trouble with quizzes. Note that quizzes are a relatively minor component of the final grade. Assignments related to the team EIS will comprise 70% of your final grade.

Drops

You may drop this course without academic penalty (there is a financial penalty imposed by the College) until 4:00 pm, July 17. **I strongly recommend that you drop much earlier than this if you are so inclined. Otherwise, you will let your team down severely. Also, there are people on a waiting list for this course.** After July 17, you must request permission from me, in writing and in person, to withdraw from the course. According to College policy, withdrawals after mid-semester are granted only for reasons of prolonged illness or unusual circumstances. The Department of Biological Sciences is very strict in these matters. Under no circumstances will I or my Department Chairperson grant permission to withdraw for academic reasons (e.g., failing grades, dislike of course, changing major, etc.).

Handicaps

If you have a physical or mental handicap, a diagnosed learning disability or concerns about study skills/academic performance that may affect your progress in this course, please

discuss this with me in private immediately. It may be possible for me to help you obtain special assistance to facilitate your successful completion of this course. Recognize, however, that this is a field intensive, physically strenuous course and that no special accommodations are possible for boat and other field activities.

The Writing Process

Overview

Coherent, clear and technically correct writing is a major ingredient for success in a career in environmental science. Writing in BIO 488/588 will require the same skills you have employed in previous courses plus content knowledge of this course. Below I review each of the steps you should take while preparing your sections of the team environmental impact statement or any written work for this or other courses.

Steps

1. **Thinking**: explore the problem by brainstorming, free association, jottings or scratch outlines; recall and record any information that comes to mind about the topic; don't worry about organization, spelling, etc. in this step.

2. **Research and Note Taking**: use your text, lecture notes, field trips, personal experiences, interviews, or references in the library as resources for developing information, facts and ideas for your sections of the team EIS.

3. **Organize**: prepare a list of main points and subpoints in logical order that you will address in your EIA or EIS sections; this is an outline.

4. **Verify Topic**: compare the original assignment with your outline; have you addressed all aspects implied in the assignment questions?; have you eliminated extraneous topics not asked for in the assignment?

5. **Write a Complete 1st Draft**: this must be done using a word processor (the College has Macintosh and PC computers and advisors in Dailey Hall and the Department has a PC center in 102 Lennon); rework the draft until you are satisfied that it is correct grammatically and says what you want it to say to meet fully the requirements of the assignment; does the draft follow your outline?

6. **Seek Peer Review**: use your EIS team members to review your writing; your team must ask another EIS team to critically review your team's impact statement using a copy of my evaluation form (see below) that will be handed out later in the term; based on the peer review and your own judgement, revise your documents appropriately.

7. **Write Final Draft**: the final writing produced should be neat, clear, concise and

follow all assignment guidelines; with your final manuscript, also hand-in your peer reviewers' comments.

Criteria for Good Writing

General Impression: Good writing begins with good thinking, i.e., knowing exactly what you want to say, and then expressing yourself clearly and directly. Coherent and correct organization, style, grammar, sentence structure, paragraphing and other mechanical components of good writing are essential to producing high quality written work, but they will never hide or make up for muddled or incoherent thinking. Clear thinking and correct exposition are the foundations of all successful writing. Furthermore, whether you have produced a high quality product or not usually will be apparent in your first paragraph.

Content Evaluation: Your paper should address clearly all factors relevant to an EIS and the project you are evaluating. Key terms and concepts should be defined explicitly. You should introduce appropriate information to support your discussion (facts, principles, examples from lectures/texts/journals, illustrations, etc.). Personal opinions, experiences and values also may be appropriate, but the relevance of any material used to support your main idea(s) or thesis must be clear. Finally, and most importantly, you must say some meaningful things, i.e., have some good, thoughtful ideas. In short, I should find your work interesting to read.

Organization: Organization is the key to presenting content coherently. It defines the overall plan and direction of your work, and will provide a sense of unity, continuity and coherence. Organization of the EIS follows the eight CEQ categories discussed in class. Within the manuscript, each
paragraph addresses one topic that is related to the CEQ category. The content of each paragraph is related to a sub-thesis stated in its first sentence (topic sentence) and contains no irrelevancies, asides or information not related to the topic sentence.

Language and Style: The kinds of words selected and their use should be appropriate for your topic and purpose. Cliche's and vernacular expressions are not appropriate for rational discussion of the scientific issues that you will write about. You should clearly distinguish among facts and opinions; the tone of your writing should be reasonable and unbiased. Avoid unneeded words, repetition of phrases and redundant content. Sentences should be varied in length and type, but strive for clarity, simplicity and coherence. Use an 'active', not 'passive', voice whenever possible (e.g., passive: In terms of an unavoidable negative impact, this project will cause the loss of aquatic macrophyte habitat that is used by juvenile fishes. vs. active: Loss of aquatic macrophyte habitat used by juvenile fishes is an unavoidable negative impact of this project.).

Mechanics: Your writing must be correct grammatically. Verb tenses must be appropriate and in agreement within sentences and throughout the text. Sentences must be complete (noun, verb, etc.). Spelling, capitalization, punctuation, etc. must be correct. All written work must be done on a word processor. Standard software used on campus has spelling, grammar and word selection checkers. A combination of these electronic aids, the ease of revisions on word processors, and peer reviews of your writing means there is no excuse for you

to give me a sloppy paper with mechanically poor writing or typos.

Grading Your Writing

Feedback: I will not mark everything that is 'wrong' with your writing and I will not be completely negative. I will try to point out strengths and weaknesses in your writing and to suggest remedial actions. Generally, I will comment in the margins and provide a brief summary of key issues at the end of your paper. Although I expect grammatically polished work from students, I am often disappointed. I may extensively edit one paragraph in your work and indicate that you must do the same with the rest of the piece. Remember that it is your responsibility to complete the paper properly and to write effectively. I will not read poor quality work repeatedly in hopes of finding some redeeming value.

Standards: My writing standards for you are based on realistic expectations for upper division/graduate students and literate professionals who will do much writing on the job. An average or 'C' paper is one that adequately and completely addresses the assignment. There are no major errors in Content, Organization and Language/Style, but there might be questionable or unclear aspects or several Mechanical errors. None of the
criteria are filled in an exceptional way. An 'A' paper is substantial, accurate and lucidly written. Points are fully developed and discussed, and there are almost no mechanical errors. It excels in several criteria and is deficient in none. As deficiencies mount, your grade will decrease. An 'E' paper is seriously deficient in at least two major criteria. In general, this level of work is unclear, vague, illogical, difficult to follow, lacks supporting information and is frustrating to read. 'B' or 'D' work falls between these categories.

Peer Review/Grading Form

I will use the form below to evaluate your team's EIS and your individual contributions to the EIS. Blank copies of the form will be given to you later in the course. You must have one other team use this form to review your EIS before you turn in a final draft to me.

Reviewing Team Names:

Your Team Names:

Title of EIS:

CONTENT EVALUATION (50%): Do the writers clearly define central terms and concepts? Are important points illustrated by examples, research findings, etc. Have all aspects of the question been addressed adequately and logically? Are the CEQ categories fully addressed? What impacts, alternatives, conditions, ideas, etc. have been left out? What examples, ideas, or information would clarify or reinforce the conclusions reached in the EIS?

ORGANIZATION, STYLE and LANGUAGE (25%): Is the EIS clearly organized around the CEQ categories and class field observations? How logical and effective are the paragraphs? Are there effective transitions between paragraphs? Are the introduction and

conclusion effective? Are terms used clearly? Is word choice appropriate? Are sentences logical and clear? Is writing style appropriately objective?

MECHANICS (25%): Are verb tenses appropriate? Which sentences have grammatical errors? Which words are spelled incorrectly? Is punctuation, capitalization, etc. correct?

GENERAL COMMENTS: What are the overall strengths and weaknesses of the EIS? What revisions should be made to improve the EIS and make it ready for final grading?

References

You will cite some scientific literature in your writings; it is important for you to cite references correctly in the **Literature Cited** section at the end of your EIS. This means you will include only references that are actually cited. In general you should paraphrase information; keep quotes to absolute minimum in the text of your EIS. If you do quote someone directly, put the refrain in quotation marks and cite it, e.g., "...smallmouth bass reproduction was impaired by marina operations, especially gasoline spills and motor exhaust" (Smith 1988, Green 1985). When paraphasing a source, cite this way: Previous researchers (Brown and Jones 1985, cited in Smith 1988) concluded that the habitat loss estimates of Barkly et al. (1982) were incorrect. Note carefully how these citations are punctuated, and how many authors are listed, when used in various text situations (compare to citations below).

Use only the following formats for citing references in your Literature Cited section. Note the exact way each type of citation is written in the Literature Cited relative to the number of authors, order and type of entries, underlining, abbreviation, capitalization, punctuation, etc. All references (do not separate books, articles and reports) should be listed in alphabetical order by first author's last name and without numbers. Always undeline or italicize genus/species names (e.g., Acipenser transmontanus or *Acipenser transmontanus*).

Article (example citation)

Barkly, L.P., J.A. Gardner and S.W. Hope. 1982. Effects of marina development on smallmouth bass in streams. Trans. Amer. Fish. Soc. 116 (2): 191-205.

Book (example citation)

Brown, E.A., and P.S. Jones. 1985. The Ecology of Black Basses (Genus *Micropterus*). John Wiley and Daughters. New York, London and Tokyo. 566 p.

Book Chapter (example citation)

Green, M.N. 1985. Reproductive behavior and habitats of smallmouth bass. In: Pages 141-167, E.A. Brown and P.S. Jones (Eds.), The Ecology of Black Basses (Genus Micropterus), John Wiley and Daughters. New York, London and Tokyo.

Government Document (example citation)

Smith, S.L. 1988. Feeding habitats of smallmouth bass (Micropterus dolomieui). U.S. Fish and Wildlife Service Report Series No. 58. Kansas City, MO. USFWS 88/03515-12. 32 p.

Internet (example citation)

Tremont, J.P. 1998. Effects of marina development on Great Lakes wetlands. http://www.michdnr/wetlands/marinas.html (many times there is no author; use keywords in title for citations in text of EIS; e.g., Marina Development 1998)

Assignments

Environmental Impact Assessment: Midway through the course, each team will prepare an EIA. This document will serve as a initial overview of the final EIS. You will cover the eight CEQ categories and reach a conclusion, without field data, on whether the project is likely to have a significant environmental impact. You will then make, and briefly defend (based on the EIA), a positive or negative declaration.

SPECIAL TEAM PROJECT: Each team will pick one of the topics below and do research on it during the course. The results will be presented to the class late in the term and summarized in a 5-8 page document copied to each of the other teams. Along with biological data collected in the field, this information will be used by all teams to prepare their EIS's.

1. Neighborhood Survey: One team will conduct a car/boat traffic survey at various times of day to assess current use of the project area and to extrapolate further use created by the proposed project. This team will also prepare and conduct a survey of residents and businesses along lower Sandy Creek to assess attitudes about the impacts of previous boat launch/marina projects in the area. This project will be mostly field work and will include odd hours and days.

2. Coastal Development Impacts: One team will review literature provided by the Instructor and conduct research in Drake Library to provide a discussion of likely positive and negative impacts of and mitigations for project-related construction activities: dredging, revetments, docks, boat traffic, etc. This project will be mostly indoor work involving reading, notetaking and writing, and may include odd days.

3. Local, State and Federal Laws/Regulations: One team will review literature provided by the Instructor, conduct research in Drake Library, and make contacts with local agencies to provide a discussion of laws and regulations applicable to development projects in wetlands and navigable waters. This project will be mostly indoor work involving literature review and some phone calls to agencies. It may include odd days and visits to agency offices.

4. Project Alternatives: One team will examine other potential local sites for this project and provide an estimate of the cumulative demand for boat launching and marina services in the Rochester region of Lake Ontario. This team will provide an overview of the likely major impacts of each alternative and the null alternative. This project will require some travel to local sites, brainstorming, and phone calls to local officials and

fishermen, and may include odd days.

Environmental Impact Statement: Each team will prepare an EIS in NEPA format by following CEQ and Instructor guidelines. Within each team, workloads will be decided and assigned equitably in terms of quantity and quality of effort required by each individual team member. EIS sections prepared by each individual will be separately identifiable, but ideally the whole EIS will be in a common format and type style. Most important: the individually prepared sections must clearly be part of an integrated whole environmental analysis of the project.

Writing Slants: Each EIS team will choose a "slant" for their EIS. Within the bounds of the data accumulated by the class, one team will write their EIS as though they are the *Developer and His/Her Consultants.* The other three teams will write from the following points of view: 1) *Independent Scientists* evaluating the data "completely objectively", 2) *Regulatory Agency Personnel* evaluting the data from the perspective of laws, regulations and permit criteria, and 3) an *Environmental Activist Group* opposed to the project.

DUE DATES:

21 Jul Team EIA's due in class; include summary coverage of of the eight CEQ categories as brainstormed by the team; does not require data; this is a best guesstimate of what the likely impacts of the proposed project will be; will serve as an outline for EIS

30 July Team special project reports to class and summaries distributed

6 Aug Team EIS's due by the end of the day

There will be a 5% per day penalty for late submissions.

Study Questions

The following questions are designed to test your knowledge of the content covered in Environmental Impact Analysis. If you can answer these questions based on lecture and reading materials, you should have little trouble mastering quizzes. Questions are indicated for each week of class.

Week 1

1. Identify by sight the family and common names of fishes, zooplankton and algae collected in the field. Explain the equipment/techniques used to collect/preserve/identify these organisms.

2. Describe the geological origins and environmental history of the Great Lakes.

3. What are the key provisions of SEQRA? How is this law administered by NYSDEC? What process does DEC go through before issuing a project permit?

4. Define and describe NEPA, EIA (or EA), EIS, CEQ, ROD, EPA, FONSI, impact, positive and negative declarations, categorical exclusion, mitigation, scoping, Notice of Intent, lead agency, Executive Order 11514, 40 CFR Part 6.

5. What is the legal and historical basis for environmental impact analysis and NEPA? What are the key provisions of the law? What are the benefits and deficiencies of NEPA?

6. What are the 11 steps or tasks required to prepare an EIS? How do EA's and EIS's differ? What are the eight categories of information required by CEQ in an EIS? Why is each important? What kinds of information typically are included in each category?

7. For a typical EIS, what are the important things to know about soils, geology, physiography/ geomorphology, climatology and floodplains? Why?

Week 2

1. Identify and be able to assign the common name and appropriate higher taxa (as specified by Dr. Dilcher) of the birds, and aquatic & terrestrial plants studied during the week. Explain the equipment and techniques used to sample these organisms.

2. Explain the basic ecology and habitats of the species found in the project area. NOTE: Be sure to check with Dr. Dilcher about whether you will be responsible for other information.

Week 3

1. Identify by sight the class/order/family/genus (as appropriate) and common names of the aquatic macroinvertebrates collected in the field. Explain the equipment and techniques are used to collect, preserve and identify these organisms?

2. Define environmental attribute. List typical environmental attributes considered in an EIS. What kinds of things do we need to know to fully assess the environmental impacts of a change in an attribute? Why are projections over time and consideration of cumulative impacts important?

3. What biological groups and ecological characteristics of a project environment should be considered when preparing an EIS? How are they typically sampled? What legislation is relevant to impacts on biological and ecological resources?

4. What are some typical environmental impacts on surface and groundwater? How are models used to estimate impacts, and what are some examples? What legislation is relevant?

5. How are primary and secondary air impacts predicted? What legislation is relevant? What impacts does noise cause and how are they mitigated? What legislation/regulations are relevant?

6. What are some typical hazards and nuisances that require EIS work? What legislation is relevant? What is meant by "historic and cultural resources"? What legislation is relevant? What steps are used to estimate historic/cultural impact?

7. What are some different approaches to evaluating impacts? What must an approach do to be effective? What are some typical screening criteria used to estimate the magnitude of impacts?

Week 4

1. Why is citizen participation in the EIS process crucial? What strategies should agencies and preparer's of EIS's use to involve the public? What steps must citizens take to: a) ensure that they find out about projects in a timely fashion?; b) determine whether a project falls under NEPA or a SEPA; c) influence how an EIS will be prepared and what will be addressed; d) object to a Negative Declaration; e) review a draft or a final EIS; and f) object to a final EIS?

2. With respect to transportation, what are some important issues to consider in an EIS? Define socioeconomics and the "human environment". What socioeconomic issues typically are considered in an EIS and why are they important? Based on the issues raised in Appendix 2 of your text, how can you improve your team EIS?

3. What is the evidence for risks to human health from consuming some Great Lakes fishes? What are some of the key Great Lakes ecosystem issues related to fisheries and exotic species?

Summary

This Course Guide was prepared to help you enjoy and succeed in this and future courses. I hope you will use the Guide extensively this semester, and that you will note how it can be improved for students in future classes. lease feel free to share with me your suggestions for improvement, verbally or in writing. For you, I wish good studying and success in Environmental Impact Analysis.

Lecture Outlines

The following pages are copies of the overhead transparencies I will use during my lectures. They are intended to provide an outline for you as I speak, along with definitions, figures and key concepts. By relieving you of much writing, these pages should make it easier for you to concentrate on what I am saying, to ask questions, and to discuss what is presented in class. Also on the following pages are supplementary readings for two of my lectures and a key to common aquatic organisms you will encounter in this course.

Sandy Harbor Marina

A Development Proposal to Enhance Recreational Boating on Lake Ontario

Presented by

James M. "Wild Build" Haynes
Lakeside Develop-It-All Corp.
Brockport, NY

May 1998

Background

In 1984-85, a public boat launching facility was built on the north side of the Lake Ontario State Parkway on Sandy Creek, Monroe County, New York. The facility consists of two launching ramps and parking spaces for about 50 vehicles and trailers adjacent to a 2 ha wetland that is part of an 8 ha complex of wetlands divided by the Lake Ontario State Parkway. The lead agency was the NYS Dept. of Transportation. That agency prepared an EIA under SEQRA and declared the project a Type II action with little environmental impact (NYSDOT 1984). In conjunction with the DOT analysis, two Brockport summer classes (1983, 1984) also conducted environmental analyses at the site. While their EISs are not available, raw data from their biological investigations can be obtained (Haynes, unpublished).

Project Description

Recently the Lakeside Develop-It-All Corp. purchased 4 ha of the upland, wetland and backwater of Sandy Creek adjacent to the state-owned public boat launch. The project will reduce the existing 4 ha of freshwater wetland to approximately 3 ha. We propose to build a full service marina on the property to accommodate sail and power boats. This will require dredging the backwater to a depth of 3 m (current depths are < 1 m), building 350 m of docks for 100 boat slips, and constructing a ship's store, repair shop, gas dock and restaurant. A small parking lot will be constructed on-site with daily overflow parking directed to the public parking areas adjacent to the facility. Proposed locations for these facilities are indicated on Map 1.

Winter storage of boats and trailers will be the responsibility of individual boat owners. Analysis of sediments indicates that toxic chemical levels do not differ from background levels in Lake Ontario sediments, so approximately 10,000 cubic yards of dredge spoil will be dumped at the nearest permitted disposal site in the lake. Boats from the marina will use the existing channel in Sandy Creek to enter Lake Ontario, and some dredging of this channel may be required. For further details, refer to the Marina EAF form prepared by the EIS teams employed by the developer.

The project is expected to cost $1.5 million and require two years to complete. Memberships and sales are expected to generate $175,000 per year. Annual expenses are expected to be $100,000.

Project Justification

Access to Lake Ontario is a critical impediment to expanded recreational opportunites: boating, sailing, fishing, water skiing, etc. The current public boat launch provides needed access for anglers, especially during fishing derbies, but does not address the needs of many boaters. Private marinas along Sandy Creek do not all provide full services for boaters and, until the recent economic downturn, were filled to capacity. This project will provide the first full service marina on Sandy Creek. Surveys in the 1990s of the marinas and local residents indicated most businesses and neighbors do not oppose a new marina facility. To mitigate potential boating safety and noise problems, the developer and owner will provide boating safety and courtesy information to renters of dock space. While the small wetland will be changed, the economic benefits to the Monroe County economy far outweigh the environmental costs. This project will pay property taxes and provide jobs for 4-6 people. For these reasons, local and state authorities should grant variances to their laws and regulations so that residents of the region can enjoy the scenic beauty of lower Sandy Creek and the economic benefits that will accrue from this project.

Logistics

The developer has his own construction firm to build the marina. He will contract with a commercial dredging firm to deepen the channel. He has hired environmental scientists from SUNY Brockport to prepare the required environmental impact statement. All questions concerning the project should be directed to the developer.