

SAULT COLLEGE OF APPLIED ARTS & TECHNOLOGY
SAULT STE. MARIE, ONTARIO

COURSE OUTLINE

Course Title: CARRYING CAPACITY

Code No.: FOR 303-4

Program: PARKS AND RECREATION/FISH AND WILDLIFE ✓

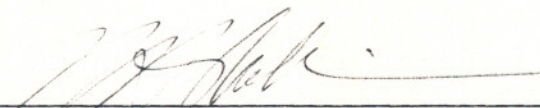
Semester: SIX

Date: DECEMBER 10, 1984

Author: HAROLD COOPER

New: _____ Revision: X

APPROVED:


Chairperson

_____ Date

CALENDAR DESCRIPTION

Carrying Capacity

FOR 303-4

COURSE NAME

COURSE NUMBER

PHILOSOPHY/GOALS: This course is an advanced ecological study of the interrelationship of plants and animal communities and the ability of the environment to support them. A review of population dynamics, the physical and biological factors affecting land capability for production and use of fish and wildlife and recreation-based resources is included. Emphasis is on multiple sustained use capacities for developed and wild lands.

METHOD OF ASSESSMENT (GRADING METHOD):

1. Term tests based on theory. 3 @ _____% = _____% (see below)
2. Attendance and assigned problems 10%
3. Practicum (see description, page 3)
Total value 20-30% of final mark. Students will decide on worth of this assignment during first class.

_____ %
100 %

Student Grades:

- "A" - Consistently excellent, over 80%
- "B" - Consistently above average, 70-80%
- "C" - Has basic knowledge of course material, 60-69%
- "I" - Incomplete - One or more units not satisfactory.
One make-up test will be held in spring,

This course is primarily designed to be presented in the lecture/discussion mode. There may be one field trip and/or field assignment based on practical means of assessing carrying capacity and the problems one may encounter. In order to get full value from the course, students will be expected to attend and participate in the discussions after each lecture.

TEXTBOOK(S):

FOR 303 - CARRYING CAPACITY

PRACTICUM:

Each student will prepare and present a workshop based on some component of the course or material related to the course. The topics for the practicum will be posted and selected by students, or assigned by the instructor. Due dates will be assigned depending on when the topic fits into the course outline. Some references will be suggested for each topic.

- The student will:
- A. Review all current literature about the topic.
 - B. Summarize the info in an organized manner.
 - C. Prepare a two-page summation of key parts for the instructor, and attach a reference list.
 - D. Present the information to the rest of the class in a lecture or workshop style. Since these topics will cover important theory material, it will be necessary for the audience to take notes on the presentation. The presenter therefore should:
 - use adequate visual aids and other aids to assist understanding of the topic
 - pace him/herself to 'note-taking' rate
 - be prepared to lead a discussion on the topic
 - attempt to make the presentation as interesting as possible
 - above all...BE WELL ORGANIZED!

FOR 303-4 - CARRYING CAPACITY

TOPIC	PERIODS	DESCRIPTION
1		<u>INTRODUCTION AND SIGNIFICANCE OF C.C.</u> <ul style="list-style-type: none">- definition of terms- importance of resource technologists- review of ecological principles; energy flow models, pyramids, communities and their characteristics - tolerance, succession, diversity and stability
2		<u>CHARACTERISTICS OF POPULATIONS</u> <ul style="list-style-type: none">A. Population Features - natality, mortality, life tables, survivorship, age structure graphs and pyramids.B. Population Growth - theoretical models - exponential growth at biotic potential, logistic (sigmoid) growth with environmental resistance, J-shaped curve<ul style="list-style-type: none">- population growth problems- divergence from above patterns; irruptive and cyclic trends- human population growth and effects on resources
3		<u>RECREATIONAL CARRYING CAPACITY</u> <ul style="list-style-type: none">- contrasts with biological carrying capacity- major components: management objectives, visitor attitudes, impact on physical resources and impact on visitor enjoyment- management to achieve or increase rec. carrying capacity- categories of recreational users and their effects

FOR 303-4 - CARRYING CAPACITY

4

FACTORS AFFECTING BIOLOGICAL CARRYING CAPACITY

A. Extrinsic Factors Acting on Populations

- density-independent factors - soil, climate
- density-dependent factors - food, cover, water, competition, disease, parasites, predation
- effects of hunting, trapping, fires, grazing, cutting, herbicides, pesticides, fertilizers and selected pollutants

B. Intrinsic Factors Acting on Populations

- reproductive habits, behavior and crowding
- territoriality and stress

5

APPLICATION OF CARRYING CAPACITY TO BACK-COUNTRY RECREATION PLANNING

- examples of backcountry or wildland activities (differences)
- expectations of users of resources
- impact of crowding and the control of over use
- estimating capacity use standards for backcountry recreation

6

WATER-BASED RECREATION AND RESOURCE USE

- lake and stream productivity ratings
- standards for development
- use of biological resources (flora, fish wildlife)
- procedure for resource planning based on use standards
- problems in determining "safe" use
- beach capability

FOR 303-4 - CARRYING CAPACITY

7

ESTIMATING CARRYING CAPACITY OF VARIOUS
RESOURCES

- nutrition-based calculations for game spp.
- food and cover mapping
- Ont. Land Inventory and Canada Land Inventory for wildlife and recreation
- other methods to estimate recreational carrying capacity

REFERENCE LIST

UNITS

PROJECTS ASSOC. WITH
UNIT

- | | | |
|---|---|---|
| 1 | (1) Robinson, W.L., and E.G. Bolen, 1984
"Wildlife Ecology Management",
MacMillan Publ., N.Y., 478 pp. | |
| | (2) Dasmann, R.F., 1964, "Wildlife Biology"
Macmillan Co., London, 135 pp. | |
| | (3) Edwards, R.Y., and C.D. Fowle, 1955.
"The Concept of Carrying Capacity"
(see "readings") | |
| | (4) Canadian Imperial Bank of Commerce, 1979
"Canadian Population Growth - Trends and
Prospects" (see "readings") | |
| 2 | (1) above, Chapter 5 | 1. Wildlife
population Cycles
- causes & effects |
| | (2) above, reprinted pages (see "readings") | 2. Human population
growth & implications
to resource use |
| 3 | (5) Lime, D.W. and G.H. Stankey, 1971,
"Carrying Capacity: Maintaining
Outdoor Recreation Quality" (see
"readings") | 3. General problems
determining rec. C.C.
4. Role of management
objectives |
| | (6) Chubb, M, 1964. Outdoor Recreat.
Land Capacity: Concepts, and
Definitions. M.Sc. thesis,
Michigan State University, 165 pp. | 5. Role of visitor
attitudes & user
characteristics |
| | (7) Tivy, Joy n.d. "Concept & Determination
of Recreational Carrying Capacity in
U.S.A.", C.G.S. Occ. paper, paper #3,
Perth, Scotland, 58 pp. | 6. Impact on Physical
Resources
7. Impact on Biolog-
ical Resources |
| | (8) Knudsen, D.M., 1984. Outdoor Recre-
ation, MacMillan Publ., N.Y., 586 pp. | 8. Management to
increase rec. c.c. |

REFERENCES...continued

<u>UNIT</u>	<u>PROJECTS ASSOCIATED WITH UNIT</u>
4 (1) Above	9. Effects of climate
(9) Schmidt, J.L. and D.L.G. Gilbert, 1978. Big Game of North America W.M.I. and Stackpile Books, Pa. 494 pp.	10. Effects of soils
	11. Effects of food quality & quantity
	12. Artificial Feeding - + & -
	13. Effects of grazing/browsing
Assorted Game Management texts	14. Cover & shelter- importance
	15. Role of Water
	16. Role of parasites
	17. Role of disease
	18. Role of predation
	19. Role of hunting/ trapping
	20. Role of forest practices
	21. Role of forest fire and logging
	22. Role of herbicides and pesticides
	23. "
	24. Role of fertilizers
	25. Role of pollutants
	26. Territoriality
	27. Migration and dispersal of animals
	28. Response to humans
	29. Learning & behavior
	30. Effects of crowding & competition

<u>UNIT</u>	<u>PROJECTS ASSOCIATED WITH UNIT</u>
5 (10) Stankey, G.H., 1973. "Visitor Perception of Wilderness Rec. C.C.", U.S.D.A. Forest Source Int - 142. Ogden, Utah. 62 pp.	31. Problem areas for B.C. users (sources of congestion)
(11) Wagar, J.A., 1964. "The Carrying Capacity of Wildlands for Recreation", For. Sci. Monograph 7. Soc. Am. For. 22 pp.	32. Expectations of back-country rec. users
(12) "Wilderness Carrying Capacity", 1977 from <u>Wilderness Management</u> , U.S.D.A. For. Service, Publ. #1365, 381 pp. (see "readings")	33. Impact of crowding on user satisfaction
(13) van Staalduin, B., 1980. The Wilderness Campsite: Criteria and Procedure for Development. M.N.R. Report. Toronto	34. Impact on resource
(14) Ibid., 1980. Evaluation of the Lakeshore Class Project. M.N.R. Toronto. 7 pp.	35. Regulation of
(15) Peterson, G.L., 1977. Concepts and Methods for Designing Entry Quotas in Quetico. N. Central Forest Experimental Station. Minnesota. 4 pp.	36. B.C. areas, acts
(16) MacDonald, C.K., 1977. Summary Report on the Interior Campsite Plan for Algonquin Park. M.N.R. report, Toronto. 36 pp.	37. regulations, quotas, etc.

<u>UNIT</u>		<u>PROJECTS ASSOCIATED</u> <u>WITH UNIT</u>
6	(17) N/A. 1977. Lake Planning Guidelines M.N.R., Toronto.	38. Limit systems for 39 Lakes
	(18) N/A. 1982. River Cottaging Guidelines	40. See ref. (18)
	(19) Jaakson, R. 1979. "A Spectrum Model of Lake Recreational C. C. Estimation".	41. Assessment by spectrum model
7	See (1) and (9)	42. O.L.I. - Wildlife
	(20) N/A. 1975. "Ontario Recreational Supply Inventory". Tourism & Outdoor Recreational Plan Study Committee, Toronto.	43. O.L.I. & C.L.I.- Recreation 44. Nutritional C.C. of Animals
	(21) Thomasson, R.D. Ontario Land Inventory for Wildlife.	45. ORSI - methods & value
	(22) Lesko, G.L., 1973. "Preliminary Site Capability for Campground Use in Alberta". Envir. Canada. N.F.R.C. NOR-X-4S. Alberta.	46. Optimum Rec. C.C. - Baseline method
	(23) Chubb, M. 1969. "Parks & Rec. Standards Research". M.S. Univ. Tech. Report #5, E. Lansing.	47. Standards - problems in assigning use standards
	(24) Suhm, L.L. "Contact Hour Unit"	48. Site Capability Rating (based on physical factors) Alberta
	(25) Sinclair, G., et al. 1973. "A Method of Calculating C.C. Potential Attractiveness and Management Input of a Site for Varied Uses", M.N.R. Toronto.	49. Calculating C.C. and Management Input for multiple use on any area
	(26) N/A. 1977. "Guidelines for Understanding & Determining Optimum Recreation Carrying Capacity". U.S. Department of the Interior BOR #5-14-07-5. Washington, D.C.	
	(27) Clark, Cameron. (n/d) Prescribing Carrying Capacity Standards for Wildland Areas..." M.N.R., approx. 20 pp.	