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The Three Hundred and Twenty-Eighth Report of the Curricular Affairs Committee: proposal for bachelor of Science Degree in Resource Development with an Interdisciplinary Major in Environmental Economics and Management

University of Rhode Island Faculty Senate

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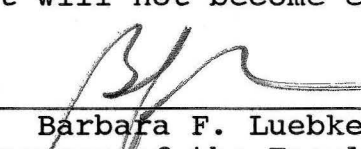
Serial Number #94-95--31

UNIVERSITY OF RHODE ISLAND
Kingston, Rhode Island
FACULTY SENATE
BILL
Adopted by the Faculty Senate

TO: President Robert L. Carothers
FROM: Chairperson of the Faculty Senate

1. The attached BILL, titled The Three Hundred and Twenty-Eighth Report of the Curricular Affairs Committee: Proposal for a Bachelor of Science Degree in Resource Development with an Interdisciplinary Major in Environmental Economics and Management, is forwarded for your consideration.
2. The original and two copies for your use are included.
3. This BILL was adopted by vote of the Faculty Senate on May 11, 1995
(date)
4. After considering this bill, will you please indicate your approval or disapproval. Return the original or forward it to the Board of Governors, completing the appropriate endorsement below.
5. In accordance with Section 10, paragraph 4 of the Senate's By-Laws, this bill will become effective June 1, 1995 , three weeks after Senate approval, unless: (1) specific dates for implementation are written into the bill; (2) you return it disapproved; (3) you forward it to the Board of Governors for their approval; or (4) the University Faculty petitions for a referendum. If the bill is forwarded to the Board of Governors, it will not become effective until approved by the Board.

 May 12, 1995
(date)



Barbara F. Luebke
Chairperson of the Faculty Senate


ENDORSEMENT

TO: Chairperson of the Faculty Senate
FROM: President of the University

Returned.

- a. Approved .
- b. Approved subject to final approval by Board of Governors .
- c. Disapproved .

 5.17.95
(date)



President

UNIVERSITY OF RHODE ISLAND
Kingston, Rhode Island

FACULTY SENATE

May 1, 1995

Faculty Senate Curricular Affairs Committee
Three Hundred and Twenty-Eighth Report

Proposal for a Bachelor of Science Degree in Resource Development
with an Interdisciplinary Major in
Environmental Economics and Management

On January 30, 1995, the Faculty Senate Curricular Affairs Committee approved the proposal from the College of Resource Development to establish a new interdisciplinary major in Environmental Economics and Management to the Bachelor of Science Degree in Resource Development.

In accordance with the provisions of section 8.85.10 of the UNIVERSITY MANUAL, the Environmental Economics and Management proposal was forwarded to the Office of the Vice President for Business and Finance on February 7, 1995 with the request that a budgetary impact statement be prepared. On May 1, 1995, the Faculty Senate Executive Committee reviewed the budgetary impact statement, dated April 24, 1995, prepared by J. Vernon Wyman, Assistant to the Vice President for Business and Finance. In his memorandum, Mr. Wyman stated that the proposed new interdisciplinary major will "be offered and supported within the existing resource base provided to both departments (Resource Economics and Natural Resources Science). Therefore, the administration, teaching facilities and library resources that currently exist, are suitable to support this new major."

After their review, the Executive Committee agreed that the proposal for a new Bachelor of Science Degree in Resource Development with an interdisciplinary major in Environmental Economics and Management does not require review and ranking by the New Program Review Committee because it meets the criteria for exemption set forth in section 8.85.24 of the UNIVERSITY MANUAL:

If programs do not require the allocation of funds for direct costs, or if the program can be entirely supported by reprogramming existing departmental funds, or if the amount of general revenue funds required per year does not exceed the current calendar year salary of an instructor, no review under 8.85.20 shall be required.

The Curricular Affairs Committee recommends that the Faculty Senate approve the proposal for a Bachelor of Science Degree in Resource Development with an interdisciplinary major in Environmental Economics and Management as follows (The proposal is in the format required by the Board of Governors for Higher Education.)

C.A.C. #328--95-5-1

PROPOSAL FOR A BACHELOR OF SCIENCE DEGREE IN RESOURCE DEVELOPMENT
WITH AN INTERDISCIPLINARY MAJOR
IN ENVIRONMENTAL ECONOMICS AND MANAGEMENT

A. PROGRAM INFORMATION

1. Name of Institution:
University of Rhode Island
2. Departments and College:
Department of Resource Economics and Department of
Natural Resources Science, jointly
College of Resource Development
3. Title of Proposed Program:
Major: Environmental Economics and Management
Degree: Bachelor of Science in Resource Development
4. Intended Date of Initiation:
Fall 1995
5. Anticipate Date of First Degree:
June 1996
6. Intended Location:
University of Rhode Island, Kingston Campus
7. Institutional Review & Approval Process

	<u>Date Approved</u>
Department of Resource Economics	<u>11/1/94</u>
Department of Natural Resource Sciences	<u>11/9/94</u>
College Curriculum Committee, CRD	<u>12/2/94</u>
College of Resource Development, Dean	<u>12/2/94</u>
Faculty Senate Curricular Affairs Committee	<u>1/30/95</u>
Faculty Senate	_____
President of the University	_____

8. Summary of the Program:

This program combines two majors, both of which deal with the management of ecosystems and the environment, into a single multidisciplinary program. Students will be better prepared to take a holistic view of resource management by having a broader understanding of the relationship between the processes of the physical and biological world and of economic systems. They will be trained to understand the competing forces which resource managers have to accommodate. The program also requires a strong background in communication skills which are critical for resolving the conflicts in resource use which necessarily arise in modern society.

The program will require no new resources, rather it will increase the productivity of existing efforts by the Department of Resource Economics and Department of Natural Resources Science.

9. Signature of the President:

Robert L. Carothers

10. Persons to contact during the review:

Stephen K. Swallow
Associate Professor
Department of Resource Economics

Blair M. Lord
Vice Provost
Academic Programs

792-4589

792-2447

B. RATIONALE

1. Description: This program establishes a rigorous interdisciplinary major for University of Rhode Island undergraduates with a strong interest in natural resource sciences and in how the environment affects the economy. The program makes more effective use of existing instructional resources in both the Natural Resources Science and Resource Economics Departments.
2. Academic and Societal Needs: This proposal arises from a belief that an interdisciplinary major will serve the best interests of many students. Nearly every agency in the federal government is moving to implement ecosystem management as a foundation for setting policy and making environmental management decisions. In addition, most policy assessments are now mandated to evaluate the benefits and costs or the economic implications of government decisions, including environmental decisions. Moreover, environmental managers are rapidly finding that environmental - or ecosystem - management problems are often

driven by the economic incentives and values that drive people's individual decisions. These factors suggest that environmental managers of the present and future will need an ever-increasing understanding of how economic factors may affect environmental management decisions and their effectiveness. Furthermore, private sector business, industry and consulting will have an increasing demand for specialists who understand both the natural sciences and the economy, particularly as the private sector faces new regulations on environmental quality.

This proposal also serves as a partial response to the Provost's report examining ways to reorganize the academic resources of the University. The existing undergraduate major offered by the Department of Resource Economics was identified as one program that did not appear to make the fullest use of existing academic resources.

In response, the Undergraduate Committee of the Department of Resource Economics has examined several options. That committee, after numerous meetings, currently believes that an interdisciplinary major with the Department of Natural Resources Science (NRS) is an opportunity that will substantially improve the effective use of the academic resources of both departments.

Several factors support the opinion that this proposal will use existing resources more effectively. First, the Department of Natural Resources Science has been given "impacted status" due to the large number of undergraduates who desire to pursue one of the majors in NRS. Thus, demand for environmental management options is strong. Second, NRS and REN faculty have found that many of the NRS majors are substantially interested in policy as related to the environment. Historically, the Resource Economics Department (REN) finds a number of NRS students seeking a feasible program to merge their interests in both departments. Many of these students will be served well by an interdisciplinary major with active advising from REN faculty, which should, in turn, help to alleviate NRS's impacted status.

Third, the resource economics field, especially as conducted for two decades at URI, is naturally interdisciplinary - training students to understand economic systems and concepts in relation to the environment while also demanding that students become well-versed in environmental and life sciences relevant to their special area of interest. The present resource economics major not only requires a substantial number of credits in resource economics but also requires a substantial number of credits in the sciences. However, students in the interdisciplinary major will be required to establish a more advanced (300-400 level) background in a spectrum of NRS subjects suitable for environmental management.

These three factors, when added to the high likelihood that this proposal provides a unique and valuable opportunity for students, provide a compelling rationale to consider NRS-REN cooperation. Therefore, we propose an interdisciplinary major with the NRS and REN faculty.

The attached curriculum is modeled from the existing NRS major in Environmental Management. It appears that an interdisciplinary major would be most complementary to NRS's current Environmental Management program. However, the existence of an interdisciplinary major in Environmental Economics and Management would not preclude the ability of students in the pure Environmental Management major from taking courses from the Resource Economics department. Likewise, NRS majors in Wildlife Biology & Management and in Soil and Water Resources could elect to take some REN courses. Conversely, traditional REN majors may still take selected NRS courses as supporting electives or basic sciences.

3. N/A
4. Clientele. This proposed interdisciplinary major will serve students with interests in environmental policy issues. These students will continue to need a solid foundation in environmental sciences, as provided by NRS. However, increasing pressure of environmental regulations on private sector business combined with increasing public involvement in government decisions has spawned a demand for graduates who also understand how human choices, often economic choices, affect the environment.

The primary source of students would be existing applicants for the NRS majors in environmental management, some 15% to 20% of whom have an interest in environmental policy. The program may well attract attention from similar students regionally because it currently appears that the most similar program in the region is offered at the Masters level by Yale's School of Forestry and Environmental Studies.

5. Projected Enrollments: We anticipate an equilibrium enrollment of majors ranging between 20 and 35 FTE students.
6. Admission requirements: Undergraduates must meet the same requirements for admission to the interdisciplinary NRS-REN major as for the existing NRS major. In addition, students under the interdisciplinary major will be included under the "impacted status" cap for NRS, currently set at 45 by the Provost. Therefore, admission to the interdisciplinary NRS-REN major requires students to complete 24 credits of coursework, including three of the following: NRS 100; BOT 111 or ZOO 111 or BIO 102; GEL 103; CHM 103, 105 or CHM 101, 102; and MTH 131. Students must also meet the weighted quality point average ("GPA") cutoff set by NRS, currently ranging between 2.40 and 2.60.

7. N/A

C. INSTITUTIONAL ROLE

1. This interdisciplinary major is consistent with URI's Land Grant University mission to disseminate knowledge and foster its application in the daily lives of the citizenry. Since environmental and economic issues have been an increasing concern of U.S. citizens for over 15 years, this interdisciplinary major responds to a need to create opportunities for citizens to develop skills integrating both environmental and economic sciences. In this way, the program also furthers URI's role in providing graduates for the public and private sector enterprises which deal with interactions between the environment and the economy.

Within the long-range plans for URI, this interdisciplinary major promotes further interdisciplinary cooperation among URI faculty across departmental lines. Such cooperation will continue to enhance the academic curriculum for undergraduates.

2. The proposed program is derived from existing majors in both NRS and REN, while leaving those existing majors intact.
3. The interdisciplinary major establishes a feasible means for undergraduates to develop a basic level of competence in both Natural Resources Science and Resource Economics without reducing their ability to specialize in one field by choosing one of the traditional majors.

Students in the interdisciplinary major will be included under the "impacted status" cap applied to all NRS majors, so there will be no additional burden on NRS enrollments.

D. CONTENT

1. Curriculum Display
- a. Title: Interdisciplinary Major in Environmental Economics and Management
- b-g. Courses, requirements, options, distribution, and electives:

General Education (27 plus 3 in M and 6 in N from credits in Basic Sciences below):

C: COM (3) and WRT (3) required
 M: (3 in calculus from Basic Sciences below)
 N: (6 credits from Basic Sciences)
 S: 6 credits
 L, A, F: up to 6 credits each, with a minimum of 15 total credits from L, A, F

Basic Sciences (32-34 credits)

Botany 111 (4) General Botany prereq. for other NRS
 Zoology 111 (4) General Zoology
 or Biology 102 (3) General Animal Biology
 prereq. for other NRS
 Zoology 262 Introductory Ecology (3) (Pre: BOT/ZOO 111)
 prereq. for other NRS
 Physics 109 + 110 (4) Intro. Physics + Lab
 Geology 103 (4) Physical Geology
 Chemistry 103 + 105 (4) Intro Chem + Lab
 or Chem 101 + 102 (4) General Chem + Lab
 prereq. for other NRS
 Chemistry 124 + 126 (4) Intro Organic Chemistry
 Math 131 (3) Calculus I or MTH 141 (4) Calc. I with
 Analytical Geometry
 Statistics 308 (3) Intro Statistics (pre: MTH 107, 108)

Introductory Professional Courses (9):

NRS 100 (3) Natural Resource Conservation
 REN 105 (3) Intro to Resource Economics
 prereq. for other REN
 NRS 212 (3) Intro Soils
 prereq. for other NRS

Interdisciplinary Major Concentration Credits (24 min.)

Forestry & Wildlife (two of the following): (6)
 NRS 301 Introductory Forest Science (3) (pre: BOT 111)
 NRS 302 Fundamentals of Forest Management (3)
 (pre: NRS 301)
 NRS 305 Principles of Wildlife Management (3)
 (pre: BOT 111, ZOO 111, and ZOO/BOT 262)
 NRS 402 Wildlife Biometrics (3) (pre: ZOO 262)
 NRS 304 Field Ornithology (3) (pre: ZOO 111)
 NRS 324 Biology of Mammals (3) (pre: ZOO 111)
 NRS 406 Wetland Wildlife Management (3) (pre: NRS 305)
 Soil & Water (two of the following): (6)
 NRS 461 Hydrology & Water Management (4) (pre: NRS 212)
 NRS 424 Wetlands & Land Use (4) (pre: NRS 423)
 NRS 412 Soil-Water Chemistry (3) (NRS 212 & CHM 124, 126)
 NRS 450 Soil Conservation & Land Use (3) (pre: NRS 212)
 NRS 423 Wetland Ecology (pre: BOT/ZOO 262 and GEL 103/105)
 NRS 451 Soil Conservation Technology (3) (pre: MTH 111)
 NRS 471 Soil Morphology and Mapping (3) (pre: NRS 212)
 Resource Economics (required) (6)
 REN 310 Economics for Environmental Resource Management and
 Policy (3) (or equivalent) (pre: REN 105 or ECN 201)
 (recommended prior to taking REN 432)
 REN 432 Econ of Land and Water Resources (General Resource
 Econ) (3) (pre: REN 105 or ECN 201)
 Two Other Courses from REN: (6) (excluding REN 470 required
 under communications):

REN 440 Benefit-Cost Analysis (3) (pre: REN 105 or ECN 201)
 REN 426X Economics of Property Rights to Natural Resources
 (3) (pre: ECN 328 or REN 310)
 REN 456 Tourism Economics (3) (pre: 105 or ECN 201)
 REN 345 International Trade in Natural Resource Products
 (3) (pre: REN 105 or ECN 201)
 REN 410 Fisheries Economics (3) (pre: ECN 328 or 323 or RI
 310)
 REN 435 Aquacultural Economics (4) (pre: REN 105)
 REN 341 Economics of Agricultural and Seafood Marketing (3)
 (pre: REN 105 or ECN 301)

Communication Skills: (9)

REN 470 Natural Resource Allocation and the Leadership
 Process (3) (pre: junior or senior status)
 One course from Communication Studies SPE (3)
 One other course in communications (3)

Supporting Electives: (12)Free Electives: (6)

D.h.1. Total required for graduation

TOTALS:

Gen Ed (plus some in Basic Sciences below)	27
Basic & Supporting Science (average range 32-34)	33
Intro Professional Courses	9
Concentration	24
Forest & Wildlife	6
Soil & Water	6
Resource Economics	12
Communication Skills	9
Supporting Electives	12
Free Electives	6
GRAND TOTAL (minimum)	120

This program meets the 120 credit minimum for a Bachelor of Science degree from a U.S. university. This total includes and above-average emphasis on communication skills. With 12 concentration credits, each in Natural Resources Science and in Resource Economics, the graduates will have a standard, basic foundation in both Environmental Management and Environmental Economics.

2. Typical Curriculum

Freshmen and Sophomore years: Typically students will complete coursework satisfying general education and/or basic sciences requirements. In addition, the typical student will complete Introductory Professional Courses (NRS 100, REN 105, and possibly NRS 212). Junior and Senior course schedules would vary depending on the student's interest and consultations with advisors. Some examples are outlined below. In all cases, advisors would assist

students in selecting supporting electives to complement these selections based on individual interest.

Example 1: Student interested in a broad environmental management and policy base.

NRS 301 Intro Forest Science
 NRS 305 Principles of Wildlife Management
 NRS 461 Hydrology and Water Management
 NRS 423 Wetland Ecology
 REN 310 Econ of Environ Resource Mgmt & Policy
 REN 432 Econ of Land and Water Resources
 REN 440 Benefit-Cost Analysis
 REN 426X Econ of Property Rights to Natural Resources

Example 2: Student interested more in private sector interactions with the environment.

NRS 301 Intro Forest Science
 NRS 302 Fundamentals of Forest Management
 NRS 450 Soil Conservation and Land Use
 or NRS 451 Soil Conservation Technology
 NRS 461 Hydrology and Water Management
 REN 310 Economics for Environmental Resource Management and Policy
 REN 432 Econ of Land and Water Resources
 REN 456 Tourism Economics
 REN 341 Econ of Agricultural and Seafood Marketing
 or REN 345 International Trade in Natural Resource Products

Example 3: Student interested in general ecology and public policy.

NRS 305 Principles of Wildlife Management
 NRS 304 Field Ornithology
 or NRS 324 Biology of Mammals
 or NRS 406 Wetland Wildlife Management
 NRS 423 Wetland Ecology
 NRS 424 Wetlands and Land Use
 REN 310 Economics for Environmental Resource Management and Policy
 REN 432 Econ of Land and Water Resources
 REN 440 Benefit Cost Analysis
 REN 426X Econ Property Rights to Natural Resources
 or REN 435 Aquaculture Economics

In addition, juniors and seniors would round out their schedules with courses in supporting or free electives and communications, including REN 470. Often, supporting electives will be drawn broadly from other departments including Biochemistry, Chemistry, Computer Science, Economics, Statistics, Journalism, Microbiology, Communication Studies, Writing, as well as NRS or REN. Suggested courses will be reviewed annually by the NRS and REN designated representatives (currently T. Husband of NRS and S. Swallow of REN). One area that some students may pursue is "quantitative methods" which would include: NRS

402 Wildlife Biometrics, ECN 376 Intro to Econometrics, Six credits from STA or CSC. Students with interests in ecology and economics might substitute NRS 410 Fisheries Economics for one course from STA or CSC.

3. Licensing and certification requirements are not applicable.

E. INSTITUTIONAL

1. In this region, there are no exact parallel programs. The closest are listed here:

Yale University, School of Forestry and Environmental Studies offers a professional masters degree in "environmental studies" with a policy emphasis.

Brown University has an undergraduate environmental studies program.

2. The objectives of the present program are to provide undergraduates with a rigorous foundation in both environmental sciences and resource economics sufficient as preparation to become contributors in the public or private sectors dealing with environmental management and economic problems or as preparation for advanced studies.

Brown University's program in environmental studies does not ensure the solid grounding in resource economics (although some Brown students may choose options to develop more depth in economics).

Yale's program is similar to Brown's but is offered for master's candidates, not undergraduates.

3. There are special provisions needed in anticipation of transfer students.
4. This interdisciplinary major would have no direct impact on other higher education institutions in Rhode Island since it draws students from the same pools as all URI majors. The interdisciplinary major, however, will be a relatively attractive option for students who recognize society's need for individuals with expertise in both natural resources science and resource economics.
5. N/A
6. N/A

F. RESOURCES

1. Administration
 - a. This program will be jointly administered by NRS and REN.

b. Responsible Persons:

Associate Professor Stephen Swallow (REN)
Professor Thomas Husband (NRS)
Time allocations will be included in existing teaching and advising assignments.

- c. This program will require no new administrative salaries or costs because it makes more effective use of existing undergraduate teaching resources in both departments.

2. Faculty

- a. Present undergraduate teaching faculty of NRS and REN will be involved through their existing classroom assignments.
- b. No faculty additions are anticipated.
- c. No support personnel additions are anticipated.
- d. No change in costs are anticipated since this program makes more effective use of existing teaching resources.

3. Learning Resources

Existing resources are already sufficient to establish this interdisciplinary major.

4. Facilities and Equipment

- a. Existing resources are already associated with courses currently taught in REN and NRS and are fully appropriate to this interdisciplinary major.
- b. No additional facilities will be required.

5. Operating Expenses

No new resources will be required. Operating expenses will be associated with labs and classrooms already in operation.

6. Scholarships and Fellowships

None available

7. N/A

8. There will be no increase in expenditure above those currently incurred by both Departments. There will likely be no increased revenues given that NRS is an impacted program. The gain will be from the value of a joining of disciplines to provide a multidisciplinary offering which will address subject matter important to the global economy and environment.

G. Evaluation

The proposed program is a unique offering in the Northeast. It will be evaluated at the end of the third year by an interdisciplinary departmental committee. In addition, the program will be subject to the periodic internal program review process which is required by the University.