<table>
<thead>
<tr>
<th>Department</th>
<th>Biology and Wildlife</th>
<th>College/School</th>
<th>CNSM</th>
</tr>
</thead>
<tbody>
<tr>
<td>Prepared by</td>
<td>Mark Lindberg</td>
<td>Phone</td>
<td>907-474-6598</td>
</tr>
<tr>
<td>Email Contact</td>
<td><a href="mailto:mslindberg@alaska.edu">mslindberg@alaska.edu</a></td>
<td>Faculty Contact</td>
<td>same</td>
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</tbody>
</table>

### 1. ACTION DESIRED
(CHECK ONE):
- [X] Trial Course
- [ ] New Course

### 2. COURSE IDENTIFICATION:

<table>
<thead>
<tr>
<th>Dept</th>
<th>WLF</th>
<th>Course #</th>
<th>No. of Credits</th>
</tr>
</thead>
<tbody>
<tr>
<td>WLF</td>
<td>F694</td>
<td></td>
<td>3</td>
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</table>

This course covers an advanced topic in wildlife management that builds on course material covered in undergraduate degree programs. The material presented in this class is broad and covers mostly introductory topics and is therefore proposed as a 3 credit class.

### 3. PROPOSED COURSE TITLE:
Decision Analysis for Conservation

### 4. To be CROSS LISTED?
- [ ] Yes
- [X] If yes, Biology Course # F694

### 5. To be STACKED?*
- [ ] No
- [ ] If yes, Course #

How will the two course levels differ from each other? How will each be taught at the appropriate level?:

* Use only one Format 1 form for the stacked course (not one for each level of the course!) and attach syllabi. Stacked course applications are reviewed by the Undergraduate Curricular Review Committee and by the Graduate Academic and Advising Committee. Creating two different syllabi (undergraduate and graduate versions) will help emphasize the different qualities of what are supposed to be two different courses. The committees will determine: 1) whether the two versions are sufficiently different (i.e. is there undergraduate and graduate level content being offered); 2) are undergraduates being overtaxed?; 3) are graduate students being undertaxed? In this context, the committees are looking out for the interests of the students taking the course. Typically, if either committee has qualms, they both do. More info online - see URL at top of this page.

### 6. FREQUENCY OF OFFERING:
Even-numbered springs

### 7. SEMESTER & YEAR OF FIRST OFFERING
(Effective AY2015-16 if approved by 3/31/2015; otherwise AY2016-17)

- [ ] Fall, Spring, Summer (Every, or Even-numbered Years, or Odd-numbered Years) — or As Demand Warrants
- [X] Spring 2016

### 8. COURSE FORMAT:

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<th>1</th>
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6 weeks to full semester

**NOTE:** Course hours may not be compressed into fewer than three days per credit. Any course compressed into fewer than six weeks must be approved by the college or school's curriculum council. Furthermore, any core course compressed to less than six weeks must be approved by the Core Review Committee.

**COURSE FORMAT:**
(check all that apply)

- [ ] 1
- [ ] 2
- [ ] 3
- [ ] 4
- [ ] 5
- [X] 6

**OTHER FORMAT**
(specific)

Mode of delivery (specify lecture, field trips, labs, etc)

Lecture
9. CONTACT HOURS PER WEEK: 3
   LECTURE hours/week  LAB hours/week  PRACTICUM hours/week

Note: # of credits are based on contact hours. 800 minutes of lecture=1 credit. 2400 minutes of lab in a science course=1 credit. 1600 minutes in non-science lab=1 credit. 2400-8000 minutes of practicum=1 credit. 2400-8000 minutes of internship=1 credit. This must match with the syllabus. See http://www.uaf.edu/uafgov/faculty senate/curriculum/course-degree-procedures-guidelines-for-computing/ for more information on number of credits.

OTHER HOURS (specify type)

10. COMPLETE CATALOG DESCRIPTION including dept., number, title, credits, credit distribution, cross-listings and/or stacking (50 words or less if possible):

Example of a complete description:

FISH F487 W, O Fisheries Management
3 Credits Offered Spring
Theory and practice of fisheries management, with an emphasis on strategies utilized for the management of freshwater and marine fisheries. Prerequisites: COMM F131X or COMM F141X; ENGL F111X; ENGL F211X or ENGL F213X; ENGL F414; FISH F425; or permission of instructor. Cross-listed with NRM F487. (3+0)

WLF F694 Decision Analysis for Conservation
3 Credits
Offered Spring Even-numbered Years
Introduction to theory and application of structured decision making and adaptive management to wildlife conservation. Prerequisites: Graduate standing or permission of the instructor.

11. COURSE CLASSIFICATIONS: Undergraduate courses only. Consult with CLA Curriculum Council to apply S or H classification appropriately; otherwise leave fields blank.

   H = Humanities  S = Social Sciences

Will this course be used to fulfill a requirement for the baccalaureate core? If YES, attach form.

   YES:  NO:

IF YES, check which core requirements it could be used to fulfill:

   O = Oral Intensive,  W = Writing Intensive,  X = Baccalaureate Core

Format 6  Format 7

11.A Is course content related to northern, arctic or circumpolar studies? If yes, a “snowflake” symbol will be added in the printed Catalog, and flagged in Banner.

   YES  NO

12. COURSE REPEATABILITY:

   is this course repeatable for credit?  YES  NO  X

Justification: Indicate why the course can be repeated (for example, the course follows a different theme each time).

   How many times may the course be repeated for credit?  TIMES

   If the course can be repeated for credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

   If the course can be repeated with variable credit, what is the maximum number of credit hours that may be earned for this course? CREDITS

13. GRADING SYSTEM: Specify only one. Note: Changing the grading system for a course later on constitutes a Major Course Change - Format 2 form.

   LETTER:  X  PASS/FAIL:  
14. PREREQUISITES
Graduate standing or permission of the instructor.
These will be required before the student is allowed to enroll in the course.

15. SPECIAL RESTRICTIONS, CONDITIONS

16. PROPOSED COURSE FEES
Has a memo been submitted through your dean to the Provost for fee approval?
Yes/No

17. PREVIOUS HISTORY
Has the course been offered as special topics or trial course previously?
Yes/No

If yes, give semester, year, course #, etc.: 

18. ESTIMATED IMPACT
WHAT IMPACT, IF ANY, WILL THIS HAVE ON BUDGET, FACILITIES/SPACE, FACULTY, ETC.
Classroom space will be needed and occasional use of laptop computers available through Biology and Wildlife.

19. LIBRARY COLLECTIONS
Have you contacted the library collection development officer (kljensen@alaska.edu, 474-6695) with regard to the adequacy of library/media collections, equipment, and services available for the proposed course? If so, give date of contact and resolution. If not, explain why not.

No | Yes | x | 10/20/2015 - 2 of the 3 books will be available through the library, the 3rd will need to be purchased and this is noted on the syllabus.

20. IMPACTS ON PROGRAMS/DEPTS
What programs/departments will be affected by this proposed action?
Include information on the Programs/Departments contacted (e.g., email, memo)

I contacted the Director of Academic Programs, Dave Valentine, in SNRE and discussed with him both NRM F649 and F403. NRM F403 is a required class for NRM majors and is offered every fall. Although NRM F403 uses one of the same texts as I am proposing for WLF 694 we believe these will be complementary courses since 403 is taught at an introductory, undergraduate level and 694 is a graduate offering and I plan to go into much more detail on a number of topics that are covered in both courses. NRM F649 is offered more sporadically and again we thought this class is complementary with WLF 694.

We plan to meet in the near future to discuss the possibility of organizing these classes and maybe others in a sequence.

WLF 410 provides an introduction to structured decision making for a couple weeks of the semester. This is a component of the class that I included in the past when I taught this class and most current instructors continue to include this material. However, this is a cursory introduction and exposure to the material and has no meaningful overlap with WLF 694.

FISH F642 Bayesian Decision Theory for Resource Management is a specialized course (see description below) on decision analysis that is focused on a specific process (Bayesian) for making decisions and therefore has limited overlap with the broad approach that I propose for WLF 694.

4 Credits
Offered Spring Even-numbered Years

Application of decision theory to problems in natural resources management. Students will learn to perform Bayesian calculations and uncomplicated decision analysis themselves. Special fees apply. Prerequisites: FISH F621 or FISH F630 or permission of instructor. Cross-listed with STAT F642. (2+2)
Finally, decision courses are offered through the School of Management, which are mostly focused on decision making in a business setting and therefore have limited overlap with WLF 694.

### 21. POSITIVE AND NEGATIVE IMPACTS

Please specify positive and negative impacts on other courses, programs and departments resulting from the proposed action.

This course fills a niche in decision analysis courses currently offered at UAF and brings this information directly to Biology and Wildlife majors, a skill that is becoming increasingly important for employment of our majors. RAP is very interested in having their students enroll in WLF 694.

Because the course I am proposing compliments other decision classes, I don’t expect negative impacts to those classes or programs. However, students in other departments may enroll in my class, which again I don’t see as negative, since this class is complimentary to existing classes. I currently teach WLF 695 a course on population dynamics of animals which is similar to courses offered in fisheries and is in fact cross-listed in this department. I have taught this class 5 times and I believe I only had 1 fisheries student during that time. So, I don’t expect significant negative impacts to any department.

### JUSTIFICATION FOR ACTION REQUESTED

The purpose of the department and campuswide curriculum committees is to scrutinize course change and new course applications to make sure that the quality of UAF education is not lowered as a result of the proposed change. Please address this in your response. This section needs to be self-explanatory. Use as much space as needed to fully justify the proposed course.

Decision analysis has long been an important concept in disciplines such as business. However, application of decision analysis to natural resource management and related fields is relatively recent with a rapid increase in application in the last 2 decades. Natural resource programs around the world are starting to recognize this growth and importance of decision analysis by offering courses and even majors in this area of study (e.g., [http://snr.unl.edu/gradstudent/special/adapt_man/](http://snr.unl.edu/gradstudent/special/adapt_man/)). We have observed the growing importance of decision analysis in wildlife conservation and related fields, however, we did not offer a specific course in this topic because we did not have a faculty member trained in this area. During the last 2 years, Mark Lindberg has worked with experts in this field including a trip to Australia to interact with some of the world leaders (see [http://www.edg.org.au/](http://www.edg.org.au/)) to develop the skills and knowledge necessary to offer such a class. He has also co-taught 2 workshops on decision analysis with other instructors at the National Conservation Training Center (US Fish and Wildlife Service - [http://training.fws.gov/](http://training.fws.gov/)) and the syllabus for this course is modeled after these workshops. We think this course is an important first step in ensuring that our students receive necessary training in this field.
National Conservation Training Center (US Fish and Wildlife Service - http://training.fws.gov/) and the syllabus for this course is modeled after these workshops. We think this course is an important first step in ensuring that our students receive necessary training in this field.

APPROVALS: Add additional signature lines as needed.

Signature, Chair, Program/Department of: Wildlife Biology & Conservation
Date: 21 Aug 2015

Signature, Chair, College/School Curriculum Council for: CNSM
Date: 9-3-15

Signature, Dean, College/School of: CNSM
Date: 9/3/15

Offerings above the level of approved programs must be approved in advance by the Provost.

Signature of Provost (if above level of approved programs)

ALL SIGNATURES MUST BE OBTAINED PRIOR TO SUBMISSION TO THE GOVERNANCE OFFICE

Signature, Chair
Date

Faculty Senate Review Committee: ___Curriculum Review ___GAAC
____Core Review ___SADAC

ADDITIONAL SIGNATURES: (As needed for cross-listing and/or stacking)

Signature, Chair, Program/Department of:
Date

Signature, Chair, College/School Curriculum Council for:
Date

Signature, Dean, College/School of:
Date
ATTACH COMPLETE SYLLABUS (as part of this application). This list is online at:
http://www.uaf.edu/uafgov/faculty-senate/curriculum/course-degree-procedures/uaf-syllabus-requirements/
The Faculty Senate curriculum committees will review the syllabus to ensure that each of
the items listed below are included. If items are missing or unclear, the proposed course
(or changes to it) may be denied.

SYLLABUS CHECKLIST FOR ALL UAF COURSES
During the first week of class, instructors will distribute a course syllabus. Although
modifications may be made throughout the semester, this document will contain the
following information (as applicable to the discipline):
1. Course information:
   - Title, number, credits, prerequisites, location, meeting time
     (make sure that contact hours are in line with credits).
2. Instructor (and if applicable, Teaching Assistant) information:
   - Name, office location, office hours, telephone, email address.
3. Course readings/materials:
   - Course textbook title, author, edition/publisher.
   - Supplementary readings (indicate whether required or recommended) and
     any supplies required.
4. Course description:
   - Content of the course and how it fits into the broader curriculum;
   - Expected proficiencies required to undertake the course, if applicable.
   - Inclusion of catalog description is strongly recommended, and
   - Description in syllabus must be consistent with catalog course description.
5. Course Goals (general), and (see #6)
6. Student Learning Outcomes (more specific)
7. Instructional methods:
   - Describe the teaching techniques (e.g., lecture, case study, small group discussion,
     private instruction, studio instruction, values clarification, games, journal writing,
     use of Blackboard, audio/video conferencing, etc.).
8. Course calendar:
   - A schedule of class topics and assignments must be included. Be specific so that it
     is clear that the instructor has thought this through and will not be making it up on the
     fly (e.g., it is not adequate to say “lab”. Instead, give each lab a title that describes
     its content). You may call the outline Tentative or Work in Progress to allow for
     modifications during the semester.
9. Course policies:
   - Specify course rules, including your policies on attendance, tardiness, class
     participation, make-up exams, and plagiarism/academic integrity.
10. Evaluation:
    - Specify how students will be evaluated, what factors will be included, their
        relative value, and how they will be tabulated into grades (on a curve, absolute
        scores, etc.)
    - Publicize UAF regulations with regard to the grades of "C" and below as
        applicable to this course. (Not required in the syllabus, but is a convenient way to
        publicize this.) Link to PDF summary of grading policy for "C":
11. Support Services:
    - Describe the student support services such as tutoring (local and/or regional)
      appropriate for the course.
12. Disabilities Services: Note that the phone# and location have been updated.
    http://www.uaf.edu/disability/
    The Office of Disability Services implements the Americans with Disabilities Act (ADA),
    and ensures that UAF students have equal access to the
    campus and course materials.
    - State that you will work with the Office of Disabilities Services (208 WHITAKER
      BLDG, 474-5655) to provide reasonable accommodation to students with disabilities.

5/21/2013
WLF/BIOL F694 - Decision Analysis for Conservation

Mechanics

- 3 Credits
- Prerequisites: Graduate standing or permission of instructor
- Location and Meeting Time: Murie 309, TR 9:45-11:15
- Instructor: Mark Lindberg
  411 Irving I
  TR 11:30-12:30 office hours
  474-6598
  mslindberg@alaska.edu

Course Reading Material

- Texts:
  - Required
  - Recommended
    - Pielke, R.A. Jr. The Honest Broker: Making Sense of Science in Policy and Politics. Cambridge. (available at UAF library)

Course Description

- Introduction to theory and application of structured decision making and adaptive management to wildlife conservation.

Course Goals

- Understand decision analysis through PrOACT process (Problem Definition, Objectives, Alternatives, Consequences, and Tradeoffs)
- Complete computer exercises in population modeling and decision analysis

Student Learning Outcomes

- Examine application of decision analysis to actual problems in wildlife conservation
- Develop skills in using common software (e.g., Netica) for decision analysis
- Use a complete decision process to inform an actual conservation problem in wildlife conservation

Instructional Methods

- Class will meet 3 hours per week and lectures will be the main instructional method. We will also consider some case studies in detail and discuss readings as a class. Small group exercises will be used to complete the term project.
Course Policies

- Students are to work independently on all assignments, unless otherwise indicated. If plagiarism (using someone else's ideas as your own) is detected, students will be given a grade of zero on their assignment/test. Note that material lifted from the internet or term papers previously submitted by students at UAF or other universities is very likely to be detected as plagiarized using online resources such as turnitin.com and plagiarism.org.
- Grades will be determined using straight percentages. Class participation will be used as a criteria to make decisions about borderline grades. This is a graduate class so I will not take attendance and I will assume that if you miss class that you have a valid reason. If you know in advance that you will miss several classes, please let me know. I will also assume that you are familiar with the student code of conduct, particularly as it applies to academic issues.
- Students are expected to submit assignments on time, and grades will be reduced by 10% each day after the due date.
- I will work with the Office of Disabilities Services (208 WHIT, 474-5655) to provide reasonable accommodation to students with disabilities.

Evaluation

- Letter grades without + or –
  - >89% - A
  - >79% - B
  - >69% - C
  - >59% - D

- Grades will be based on following:
  - Homework Assignments – 50%
    - Assignments (5) will address all components of the decision process and provide you with the tools necessary for completing the term project. Assignments will include written assignments through computer exercises.
  - Term Project – 50%
    - Term projects will be completed in small groups and will include an oral presentation of results

Grades and Grade Point Average
You must have a cumulative GPA of 3.0 in the courses identified on your Advancement to Candidacy form to remain in good standing and to graduate. In addition, for the purpose of satisfying degree requirements, you must earn a B (3.0) or better (no P grades) in each F400-level course and a C grade (2.0) or better in each F600-level course. NOTE: A B- is less than a 3.0 and, if obtained in a F400-level course, will not count for meeting degree requirements; likewise, a C- is less than a 2.0 and, if obtained in a F600-level course, will not count for meeting degree requirements.

Course Calendar (Tentative)

<table>
<thead>
<tr>
<th>Week</th>
<th>Topic</th>
<th>Reading</th>
<th>Assignments</th>
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<tbody>
<tr>
<td>11 Jan (class will only meet on R, Jan 14,</td>
<td>Introduce Class</td>
<td>• Smart Choices (SC) – Chap 1</td>
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<tr>
<td>Date</td>
<td>Topics</td>
<td>SC - Chaps</td>
<td>DM - Chaps</td>
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<tr>
<td>18 Jan</td>
<td>- PrOACT</td>
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<td></td>
<td>- Problem Definition</td>
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<td></td>
<td>• Decision Making (DM) - Chaps 1&amp;2</td>
<td>• SC - Chap 2</td>
<td>• DM - Chap 2</td>
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<tr>
<td>25 Jan</td>
<td>- Identify Term Projects</td>
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<td></td>
<td>- Identify and Describe Objectives</td>
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<td></td>
<td>• SC - Chap 3</td>
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<td>• DM - Chap 3</td>
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<tr>
<td>1 Feb</td>
<td>- How to Develop Alternatives</td>
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<td>- Develop Term Project Objectives and Alternatives</td>
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<td>• SC - Chap 4</td>
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<td></td>
<td>• DM - Chap 6</td>
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<td>8 Feb</td>
<td>- Quantify Consequences</td>
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<td>- Psychology in Decision Making</td>
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<td></td>
<td>• SC - Chap 5&amp;10</td>
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<td>15 Feb</td>
<td>- Term Project Development</td>
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<td>- Solving Single Objective Problems</td>
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<td></td>
<td>• SC - Chap 6</td>
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<td>22 Feb</td>
<td>- Consequence Tables</td>
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<td>- Decision Trees</td>
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<td>29 Feb</td>
<td>- Solving Multiple Objective Problems</td>
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<td>• SC - Chap 9</td>
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<td>• DM - Chap 5</td>
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<tr>
<td>7 Mar</td>
<td>- Predictive Modeling</td>
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<td>- Modeling Exercise</td>
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<td>14 Mar</td>
<td>Spring Break</td>
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<td>21 Mar</td>
<td>- Accounting for Uncertainty</td>
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<td>- Risk Analysis</td>
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<td>• SC - Chaps 7&amp;8</td>
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<td>• DM - Chap 7</td>
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<td>28 Mar</td>
<td>- Monitoring and Adaptive Management</td>
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<td>- Project Development</td>
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<td>• SC - Chap 11</td>
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<td>• DM - Chap 8</td>
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<tr>
<td>4 Apr</td>
<td>- Case Study:</td>
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<td>• DM - Chap 9</td>
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<td>Case Study #2</td>
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<td>• Case Study: Adaptive Harvest Management of Waterfowl</td>
<td>• DM – Chap 9 - Case Study #1</td>
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<td>• Guided Project Development</td>
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<td>• Project Presentations</td>
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<td>2 May</td>
<td>• Project Presentations</td>
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