Executive Summary

The graduate program in the Department of Natural Resources Management (NRM) within the College of Agricultural Sciences and Natural Resources (CASNR) was scheduled for its 6-year review in 2011–2012. The five committee members chosen by the Graduate School to conduct this review were Drs. Randall Jeter (Biological Sciences), Jeff Johnson (Agricultural and Applied Economics), Jeff Lee (Geosciences), Tala Awada (School of Natural Resources, University of Nebraska–Lincoln), and Stuart Marsh (School of Natural Resources and the Environment, University of Arizona).

The internal review committee members met with Dr. Clifford Fedler and Marlene Kenady at the Graduate School on December 12, 2011. The charge given to the committee was to formulate objective judgments of the quality and effectiveness of the graduate program, and to determine where the program fits in the discipline regionally, nationally, and/or internationally. All committee members then reviewed the “program self-study” documents provided by NRM with assistance from the Graduate School. The on-site visit took place on January 23–24, 2012. The committee held separate meetings with the Department Chairperson and Graduate Advisor, Interim Dean of the College, faculty, and graduate students, and was given a comprehensive tour of the facilities.

According to its mission statement, NRM is “committed to providing the highest standards of excellence in learning, research, and engagement on all aspects of regional, state, and global natural resource management and environmental sciences.” Their vision is to be “perceived by the public as the center of excellence for leadership, discovery, and delivery of disciplinary and multidisciplinary knowledge on all current and emerging aspects of the regional, state, and global natural resource management and environmental sciences.”

The committee noted that the NRM graduate program has a number of positive attributes. At present there are 12 tenured/tenure-track faculty at the full, associate, or assistant professor level who have an acceptable level of productivity, and four open positions are now being advertised. The department has 20 doctoral and 40 M.S. students in the current (2012 spring) semester. This represents a
upward trend, since the total number of graduate students remained relatively steady (ranging from 32 to 38) between 2005 and 2010. Another major change in the past year has been the merging of separate M.S. and Ph.D. degrees in Wildlife Science, Fisheries Science, and Range Science into one M.S. and one Ph.D. in Wildlife, Aquatic, and Wildlands Science and Management. Graduate education is enhanced by a close connection with the Texas Cooperative Fisheries and Wildlife Research Unit (TCFWRU). Extramural funds brought into the department to support graduate research during the past 6 years have averaged over $905,000 per year. It was evident to the committee that NRM is thinking proactively about how to adapt to changing research opportunities, such as its participation in the new South-Central Climate Science Center. Importantly, deep internal divisions that were present in the department several years ago appear to have been healed, creating a much more positive environment for teaching and research and putting NRM on a rising trajectory to make future progress.

On the other hand, the committee identified several issues that could impede such progress. Briefly, the graduate students expressed some concern that most of the graduate-level courses being offered by the department are combined undergraduate/graduate (“piggyback”) classes that do not provide them with much of an intellectual challenge. The faculty and students are scattered among several different buildings and the facilities, while generally adequate, are old and, in some cases, in need of renovation. For the long term, the possibility of constructing a new, state-of-the-art building that brings everyone in the department under the same roof and facilitates productive teaching and research interactions should be given serious consideration. Lastly, it is crucial for the future success of the department that new faculty hires receive start-up packages that are at least comparable to those offered by our peer institutions.

In summary, the committee gives the NRM graduate program an overall ranking of **good to very good** with more detailed assessments and recommendations in each of the specific areas described below.

**Program Overview and Vision – Rating: Very Good**

The Department of Natural Resource Management has had a distinguished history of providing a quality educational experience, both in terms of courses and research experience, to its graduate students. The Department Chairperson and faculty are committed to the mission and vision statements published in the NRM Strategic Plan. The Department is organized to fulfill the mission of providing learning, research, and engagement in all aspects of natural resource management
and environmental services. The faculty is committed to the vision of being the center of excellence in all important aspects of natural resource management and environmental services. Because of the overwhelming faculty support of and knowledge of the strategic plan, it is evident that the faculty was very involved in the planning and vision development for the strategic plan.

NRM plays a key role at the state, region, and national level in the education of natural resource management graduate students who go on to successful careers. Faculty members have been recognized through internal teaching and research awards and by recognition by the Society of Range Management and the Wildlife Society. Faculty members are also serving as editors and members of editorial boards of high impact professional journals. Faculty have also been very successful in securing research funding to support graduate student research and are clearly doing all they can to provide a high quality experience for their graduate students. An employment rate of 93% for their graduates clearly attests to both NRM’s commitment to their graduate students and the success of their efforts. The number of inquiries by prospective graduate students (~100/year) and the very high rate of graduate students that accept admission are particularly impressive. Finally, NRM’s $7.5 million endowment also attests to the department’s reputation, and efforts to grow this fund continue.

Over the review period, NRM clearly suffered the effects of the loss of senior faculty (25%), budget cuts, and internal friction. Currently, the new Department Chairperson, Dr. Mark Wallace, is in the process of overcoming these problems with the support of the faculty, and he is to be commended for these positive changes. In December 2011, NMR was given four new faculty lines to address faculty loss. These positions in Aquatic Sciences, Fire Ecology and Modeling, Quantitative Applied Ecology, and Regional Natural Resources Planning and Management represent an incredible opportunity to revitalize NRM. In addition, the Department is part of an interdisciplinary initiative by the TTU Climate Science Center to bring in more senior faculty in Climate Response Modeling and Analysis. Clearly, making the right hires into these positions and providing sufficient salary and start-up funding to attract excellent new faculty will be critical to the future success of NRM. The opportunity presented by these multiple hires would be unique for any Department and we are confident that the Department Chairperson and faculty, Dean of the College, and the University Administration will provide the support to bring in great new faculty.

The impact of budget cuts has clearly affected NRM. The state line item funding for NRM has been used in the past to provide graduate faculty members with
research assistants, summer salary, and staff support as well as operational support. Though clearly a wonderful advantage for faculty and graduate students that appears to have been used productively, the uncertainty of this funding into the future requires implementing a new model. These funds, whatever they might be in the future, must be directed to support new and junior faculty to allow them the best chance of implementing their research career. Such a shift would also provide further incentive to existing faculty to develop and submit more proposals to support their research and their graduate students. When the review committee met with the faculty, all seemed to understand the need to implement a new budgetary model that creates incentives for grant writing and submission and supports the next generation of faculty.

With the implementation of Responsibility Centered Management (RCM) budgeting, NRM is also faced with the need to attract more undergraduate and graduate students and put greater emphasis on securing state, federal and private research grants. NRM is clearly pursuing both goals and is assessing alternative graduate models (non-thesis Masters and 5-year co-terminal Bachelors/Masters), which will clearly position them for the future.

What perhaps remains to be resolved by NRM faculty and the Department Chairperson is developing how they wish to market themselves to prospective graduate students. Development of their new recruiting video “Securing the Legacy” and the B.S. degree program in Conservation Law Enforcement were excellent steps in the recruitment of undergraduates. Now NRM needs to clearly develop and state what they are best at and what they have to offer to future graduate students. By developing the “value proposition” of the department they will be able to better guide their hiring decisions, allocation of limited resources and attract new graduate students.

**Curriculum and Programs of Study – Rating: Good**

NRM’s curriculum and programs of study have undergone significant change in the past year. The decision to combine the multiple individual degrees in Wildlife Sciences, Fisheries Science, and Range Science into single M.S. and Ph.D. degrees in Wildlife, Aquatic, and Wildlands Science and Management is a step many natural resource sciences departments have already taken and should surely benefit the department as it moves forward. The recent (2010–2011) comprehensive review of courses and content and procedures for adding new courses appears to have been successful in having faculty work in a unified direction for the overall benefit of NRM.
There are currently 60 graduate students in the department and the 5-year annual average has been 39.8. Average rates for graduates per year (5.89 M.S. and 3.6 Ph.D.) are quite reasonable given expected yearly recruitment but certainly there is room for growth. Average time to completion statistics are also quite good. M.S. and Ph.D. students appear to have most of the courses and guidance they need to complete their degrees efficiently. One issue raised by both faculty and graduate students is the potential penalty to the department and thus the students regarding time to completion (99 SCH rule) set by the State of Texas. The department’s implementation of annual reviews of each graduate student’s progress should help students complete their degree within the University guidelines. Obviously the Department and University face conflicting objectives – demonstrate productivity in terms of graduate graduation rates compared to RCM funding metrics based upon SCH.

Review of NRM’s graduate curriculum, particularly in light of the 4–5 new faculty hires, indicates that the department will be well positioned to meet the needs of their students. Both faculty and students see a need for more graduate-only courses, a teaching wet laboratory, and advanced biometrics/quantitative methods classes. These issues clearly can be addressed in the coming years as the new faculty hires are recruited and assigned teaching responsibilities and may be a source of increased SCH if these courses also attract graduate students from outside the department. In light of the additional new faculty positions, NRM will need to perform a curriculum assessment and implement restructuring to align offerings with current and future graduate student needs and faculty vision for the department.

The recent addition of a non-thesis MS degree will boost SCH in graduate courses and thereby increase department income. The workload on individual faculty members will increase due to this new program, but not excessively.

**Faculty Productivity – Rating: Very Good**

The faculty members of NRM are productive and take their responsibilities for graduate education seriously. They are to be commended for their efforts.

Between 2005 through 2010 the number of full-time faculty has been between 12 and 14. The productivity of the faculty in terms of refereed articles and abstracts has been impressive (averaging ~4 publications per faculty FTE/year). In terms of teaching, over the period 2005 through 2010 the College average SCH/FTE was 184
while NMR’s average was 147. Though somewhat lower than the College average, the loss of a significant number of faculty over this same period would clearly have impacted these numbers. Encouragingly over the past three years the SCH/FTE has grown steadily and in 2010 the number was essentially equivalent to the College average. Several faculty members also have been recognized with outstanding teaching awards, a clear indication of the teaching expertise of many in the department. A significant number of faculty members have positions of responsibility in professional societies and academic journals.

The number of successfully funded grants since 2005 has totaled ~5.5 million dollars and has average ~$900,000 per year. This level of funding is below identified peer institutions, some of which are Tier One Research Universities. The need to increase external funding is apparent to all faculty members who were interviewed. They also recognize that because current funding from multiple agencies is in decline, faculty will have to diversify the sources of funding to which they apply and be more active in the development of interdisciplinary research grants. Connection to the TTU Climate Science Center hopefully will help to facilitate the development of interdisciplinary proposals. Clearly, the future success of NRM will depend on the commitment, initiative, and resourcefulness of its faculty.

Many faculty members currently are the thesis/dissertation advisor for four or five graduate students at a time, which seems to be the maximum number of students any faculty member can be expected to mentor effectively. The hiring of four new faculty members this year should spread out the advising responsibilities. Any significant growth in the graduate population, however, may have to come from the new non-thesis Masters program.

The department has a history of contentiousness among the faculty of the different sub-disciplines. The current atmosphere in the department, however, is collegial and the faculty members work together for the benefit of the department and the students. They are to be commended for this progress.

On a final note, the lack of diversity in the faculty is something recognized by all concerned, and it is hoped that this can be addressed by the new faculty searches that are underway.

Quality and Quantity of Graduate Students and Graduates – Rating: Very Good

Perhaps the most impressive aspect of NRM is the quality and dedication of their graduate students. The academic quality of the students is very high and they play
an important role in performing the wide range of research initiatives being carried out by the faculty. Research assistants at the M.S. level receive $15,000/annum and Ph.D. students receive $18,000/annum plus benefits. This level of compensation is reasonable but clearly could be increased if research funding increases on a sustainable basis.

The review committee met with approximately 20 NRM graduate students over the course of more than two hours. The students were particularly appreciative of:

- The dedication of the faculty
- The encouragement by faculty for students to design their own research projects and their participation in writing research proposals with faculty
- The department’s efforts to find alternative funding when graduate student projects either fall through or reach completion
- The department’s financial and moral support for travel to meetings and making presentations at those meetings
- The department’s support in helping the students find positions upon graduation
- Support by the department for the student organization.

Concerns voiced included:

- The need for an ecological statistics course
- The need for more graduate-only classes
- More summer support for research
- The requirement to register for 9 credit hours over the summer
- Several TA’s are bearing the full teaching responsibility for freshman and sophomore courses and sometimes find it difficult to meet the associated demands on their time and focus on their studies and research
- The variable oversight of graduate student teaching by faculty (particularly in general education courses) unless it is sought out by the graduate student
- The need to increase the diversity of the faculty
- The desire to have more focus on professionalization through seminars that would include grant writing and preparation for Ph.D. students for academic positions.

Nevertheless, the students appear happy overall with their educational experiences and are doing very well. These students represent a great asset to NRM, should continued to be nurtured, and they want to help the department move forward and grow.
Facilities and Resources – Rating: Satisfactory

The overall evaluation of the Departmental facilities is that they are aging but have been satisfactory due to the faculty’s innovation and cooperation; however the facilities are inadequate for the Department in a phase of growth and revitalization. Although the faculty and graduate students are able to be productive in spite of current facilities, the labs tend to be crowded and inadequate for newly acquired lab equipment. The faculty is able to collaborate and co-locate with faculty from the Texas Cooperative Fisheries and Wildlife Research Unit (TCFWRU) and other departments on campus, but that imposes an unreasonable burden on the NRM faculty and the faculty of the other departments. The unit’s partnership with the TCFWRU alleviated some of these facilities-related concerns. Locating faculty and graduate students over several buildings clearly has detrimental impacts on the quality of research, attraction of top candidates, interdisciplinary collaborations, attraction of large grants, delivery of quality program, and capacity to grow in the future.

The range site near campus is the brightest aspect of the NRM facilities. It provides opportunities for studies related to native rangeland, playa lake interactions, and wildlife habitat at a site that is very near to the central campus. Its use for both undergraduate and graduate classes, student and faculty research, and as a unique preserve of a range environment is particularly important to the Department. Ultimately the site could prove valuable as an interdisciplinary research site for cooperative work between NRM faculty and scientists with the new TTU Climate Science Center. All efforts should be made to maintain and enhance this area for education and research at TTU.

Library resources and information technology are very good for the mission of the Department. The support staff is adequate for current operations, but should be increased as the Department continues to grow to meet its strategic goals.