

## Follow-up Study of CANR Undergraduate Students: Fisheries and Wildlife Majors

The purpose of this study was to assess the effectiveness of the CANR undergraduate programs as perceived by alumni and employers. Specifically, the objectives of this study were to:

1. Assess the perceptions of alumni toward the educational programs of the CANR, including courses taken and educational preparation.
2. Explore the opinions of the alumni about the quality of instruction received within the college.
3. Ascertain the opinions of alumni about their academic advising.
4. Determine whether the alumni found participation in extracurricular activities useful in relation to their current employment.
5. Identify employment information of graduates within the college.

### METHODS/PROCEDURES

#### Population and Sample

The target population of the study comprised of CANR bachelor's degree graduates from summer semester 1993 through spring semester 1998. A list of 3,400 graduates from all departments within the college was developed. A stratified random sample of 1,269 graduates was used in the study. The strata were proportional to the size of the 12 academic departments within the CANR. **However, the findings for this report pertain only to the Fisheries & Wildlife Science alumni.**

#### Instrumentation

The instrumentation for the study was a mail questionnaire. Two questionnaires were designed -- one for the alumni and one for their employers. The instruments included both open-ended and closed questions. The researchers developed the instruments after a careful review of previous follow-up studies; most scalar questions included in the instrument were adapted from these studies. The validity of the instrument was established through a panel of experts.

The instrument was tested for reliability using Cronbach's alpha procedures. For the alumni questionnaire, an alpha coefficient of .72 was determined for the scale pertaining to perceptions of educational preparation by required general courses outside the college; .76 for their education within the college; .79 for the preparation for work by the college; .89 for the quality of instruction; .89 for academic and career advising; .84 for extracurricular activities; and .75 for the graduates' satisfaction with their current positions. The employer questionnaire had an alpha of .87 for the scale relating to preparation for work by the college and .94 for the scale relating to career performance. These Cronbach alpha values were considered adequate to establish reliability for the scales included in this study.

### Data Collection

The data collection procedure used in this survey followed the recommendations of Dillman (1994). The first mailing was sent to all members of the sample and included a personalized cover letter, the questionnaires and return envelopes. A follow-up postcard thanking the respondents and asking those who had not responded to send in the questionnaire was sent out a week after the first mailing. The third and final mailing was sent out with a new cover letter to those who had not responded three weeks after the initial mailing. The researchers noted a significant frame error in this study, as 156 of the packets (12 percent) were returned as undeliverable.

Altogether, 359 usable questionnaires were received from the alumni population, resulting in a response rate of 32 percent. The researchers recognize the need to have a higher response rate to be able to generalize findings to the population. However, early and late respondents were compared to determine if they differed significantly on selected variables under study, and no differences were observed. Therefore, as suggested by Miller and Smith (1983), we generalized the findings to the study population.

All alumni included in the sample also received a second survey packet designed for their employers. They were requested to give the employer survey packet -- including a cover letter, questionnaire and pre-addressed stamped envelope -- to their respective supervisor. We received responses from 85 employers.

### Analysis of Data

The data were analyzed using the Statistical Package for the Social Science (SPSS). Statistical methods such as means, frequencies, percentages, cross tabs, standard deviations and t-tests were used to analyze the closed-ended questions. The non-response error was dealt with through a t-test comparing responses from early and late respondents.

### Limitations

A limitation of this study is that it includes only CANR graduates from 1993 to 1998 and their current employers. An employer population did not exist -- we requested the alumni to give the instrument to their respective employers. This study assumes that the alumni identified appropriate employers and that they represent the views of employing agencies. The lower response rate could be another limitation.

## FINDINGS

### Demographic Information

Of the 33 Fisheries & Wildlife Science alumni who responded in this study, the majority (59.4%) were male. Their ages ranged from 23 to 36 years, with the majority (90.6 percent) being younger than 30.

Response Rates by Major

Table 1. Response rates by major

Major Department	Number of Questionnaires Mailed	Frequency of Returns	Response Rate %
Agricultural & Extension Education	94	42	45
Agricultural Economics	123	34	28
Agricultural Engineering	122	21	17
Animal Science	114	43	38
Crops & Soil Science	98	31	32
Fisheries & Wildlife	120	33	28
Food Science & Human Nutrition	62	15	24
Forestry	75	24	32
Horticulture	101	39	39
Packaging	137	32	23
Parks & Recreation	104	31	30
Resource Development	119	31	30

Table 2. Educational preparation by required courses

Required Courses	(N)	Percent					Mean (SD)
		Poor	Fair	Good	Very Good	Excellent	
Basic Sciences	30	0.0	3.3	36.7	40.0	20.0	3.76 (.81)
Mathematics	29	6.9	13.8	31.0	27.6	20.7	3.41 (1.18)
Computer related courses	26	15.4	38.5	26.9	19.2	0.0	2.5 (.98)
Economics	24	12.5	16.7	58.3	8.3	4.2	2.75 (.94)
Basic Social Sciences	30	0.0	23.3	46.7	23.3	6.7	3.13 (.86)
Arts and Humanities	28	0.0	25.0	50.0	17.9	7.1	3.07 (.85)

Scale mean = 3.08 (St.Dev.=.65 )

Overall Rating of Elective Courses

**Overall quality of elective courses**

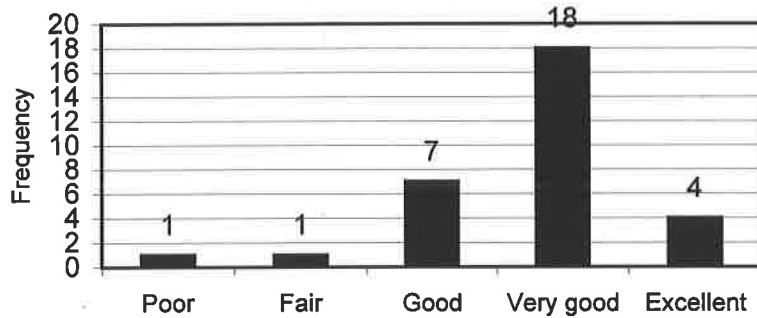


Figure 1.0 Overall quality of elective courses N=31

Table 3. Opinions of alumni toward their education within the college

	(N)	Percent					Mean (SD)
		Strongly disagree	Disagree	Neutral	Agree	Strongly Agree	
Relates to my present job	31	19.4	12.9	9.7	25.8	32.3	3.38 (1.54)
Was current in relation to issues within my field	33	6.1	12.1	12.1	39.4	30.3	3.75 (1.19)
Prepared me to be a problem solver when faced with new situations	32	0.0	9.4	12.5	56.3	21.8	3.90 (.85)
Prepared me to work easily with others	32	3.1	3.1	9.4	53.1	31.3	4.06 (.91)
Prepared me to be a leader	32	3.1	9.4	34.4	40.6	12.5	3.5 (.95)
Taught me skills for my present job	33	9.1	21.2	12.1	33.3	24.2	3.42 (1.32)
Taught me the importance of being motivated	32	3.1	9.4	28.1	28.1	31.3	3.75 (1.10)

Scale mean = 3.66 (St.Dev.=.73)

Preparation for Work by the College

Table 4. Preparation for work by the college

	Percent						Mean (SD)
	(N)	Poor	Fair	Good	Very Good	Excellent	
Writing skills	33	0.0	21.2	45.5	15.2	18.2	3.30(1.01)
Oral communication skills	33	0.0	21.2	51.5	21.2	6.1	3.12(.81)
Mathematic skills	32	12.5	15.6	43.8	25.0	3.1	2.90(1.02)
Computer skills	32	21.9	40.6	25.0	12.5	0.0	2.28(.95)
Technical knowledge	33	6.1	21.2	48.5	24.2	0.0	2.90(.84)
Getting along with people	33	0.0	15.2	36.4	36.4	12.1	3.45(.90)
Working in teams	33	0.0	6.1	36.4	42.4	15.2	3.66(.81)
Knowledge of career opportunities	32	25.0	34.4	21.9	15.6	3.1	2.37(1.12)
Ethical standards	33	0.0	21.2	45.5	27.3	6.1	3.18(.84)

Scale mean = 2.98 (St.Dev.=.51)

Overall Satisfaction of Educational Preparation by the College

**Overall satisfaction within the college**

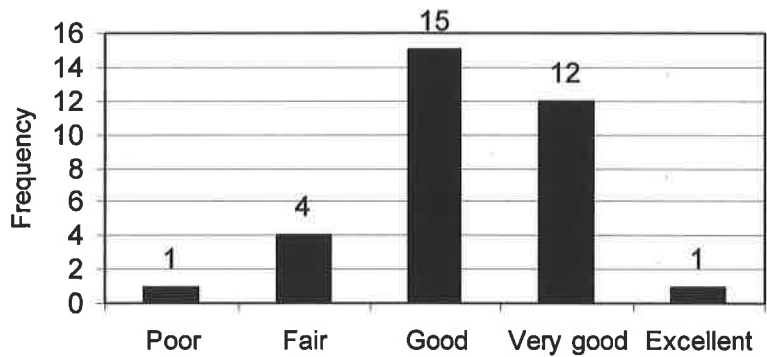


Figure 2. Overall satisfaction within the college N=33

What Needs the Most Academic Improvement within the College

All of the comments from the Fisheries & Wildlife Science alumni are listed below.

- Job placement issues
- Needs to be more applicable to future jobs (for example, I had one class which did a great job at preparing me for a typical job responsibility – we practiced writing responses back to the public’s questions or complaints. This was probably the best job application I had.)

- Update courses to the modern standards today's society demands – some courses were out dated.
- Hands-on experience.
- More classes with emphasis in computer use.
- Preparation for a sparse job market. A quote from a professor stated “90% of Fisheries and Wildlife students receive jobs pertaining to their degree” Impossible!
- More help in deciding what field of work you want to pursue
- More classes relating to actual processes and laws of the state and federal wildlife regulation agencies.
- Computer classes; knowledge of GIS
- Computer use and technical writing. Calculus and organic chem - why? I never use them.
- It has been six years since I graduated and I don't feel I could honestly answer this question with out knowing what is currently happening in the college
- In fisheries – the actual technical aspects and field tasks weren't covered well (thoroughly) enough.
- Less requirements or more selection of electives
- I'd like to see an environmental education track
- Teachers attitudes towards undergraduates
- Job placement – make students aware of what kind of jobs they are truly likely to get.
- The practical applications of formulas in lab and real life.
- More computer skills – general computer experience, more specific to the field – ie GIS/GPS. General university requirement of CPS 100 was useless
- Advisement of future job possibilities (or lack there of)
- The need to discuss types of jobs people get with major. There is a need to discuss lack of job opportunities in major.
- Field work
- More emphasis on critical thinking skills and less on pure memorization
- I am not working in a field related to my college experience.

Opinions of Alumni about the Quality of Instruction

Table 5. Alumni's perceptions toward the quality of instruction within the college

	(N)	Percent					Mean (SD)
		Poor	Fair	Good	Very Good	Excellent	
Teachers' knowledge of subject areas	33	0.0	0.0	21.2	54.5	24.2	4.03 (68)
Teaching skills	33	3.0	9.1	42.4	39.4	6.1	3.36 (.85)
Classroom discipline	32	0.0	6.3	37.5	46.9	9.4	3.59 (.75)
Helping students outside the classroom	33	0.0	12.1	45.5	24.2	18.2	3.48 (.93)
Evaluation and grading of students' work	33	0.0	12.1	54.5	30.3	3.0	3.24 (.70)
Classroom assignments	33	0.0	6.1	54.5	36.4	3.0	3.36 (.65)

Scale mean = 3.49 (St.Dev.=.54)

Opinions of alumni about their academic and career advising

Table 6. The opinions of alumni toward academic and career advising

	(N)	Percent					Mean (SD)
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Helped me decide the courses to pursue	32	9.4	18.8	37.5	3.1	31.3	3.28 (1.34)
Was easily accessible	32	9.4	15.6	53.1	9.4	12.5	3.0 (1.07)
Helped me find my first position	30	60.0	20.0	3.3	13.3	3.3	1.8 (1.21)
Helped me prepare my resume	31	58.1	22.6	16.1	3.2	0.0	1.64 (.87)
Helped me with interviewing skills	31	61.3	25.8	9.7	3.2	0.0	1.54 (.80)

Scale mean =2.23 (St.Dev.=.78)

Use of the MSU Career Services and Placement Office

- My advisor offered no career advising and his academic advising led me to take courses out of College Pre Rec. Requirements.
- I feel we were assigned an extreme amount of reading and memorizing; I would rather read and memorize less and retain more of it then to read so much that I don't remember hardly anything except for a few interesting facets.

- I majored in Fisheries and Wildlife, and professors were our academic advisors. Many were not familiar with courses or very helpful. I did most if not all of my academic planning. Need full-time advisors in that department.
- They should teach and encourage interviewing skills.
- I didn't use them in college, I guess I felt my field was non-traditional (F & W) - so I didn't think there were many jobs to apply to.
- MSUGSP/advising center needs more job listing focused towards fisheries and wildlife (full/part time/internships). Also, need on campus interviews for Fish/wildlife students
- I was basically on my own - which I believe this is the way it should be
- It was available, but I did not have a real need for it. Once I had my curriculum guide I really didn't have too many questions.
- The problem is that most teachers relinquish the responsibility or desire to help you once you graduate, when their expertise, knowledge, and connections are what you really need at the time.
- Most job postings were within the NR building
- By the time I saw an advisor most of my course was set so any advice was ineffective or impossible
- Allow department advisors more flexibility to substitute university required courses with those more specific to the student's career goals. Example: General Biology – ecology, social sciences – human dimensions
- Very few job listings for students pursuing natural science undergrad. Degrees
- Advisors need to schedule more time with students. More than 15 minutes.
- Shouldn't cost more money in order to use career services products and/or functions



Alumni Participation in Extracurricular Activities

Of the respondents, 45.5 percent had participated in an internship.

Table 7. Usefulness of internship experiences

	(N)	Percent					Mean (SD)
		Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree	
Was useful in preparing you for your first position	15	6.7	13.3	0.0	20.0	60.0	4.13 (1.35)
Helped you with deciding on your first position	14	14.3	7.1	14.3	14.3	50.0	3.78 (1.52)
Helped you become more attractive to employers	15	6.7	13.3	6.7	13.3	60.0	4.06 (1.38)
Was a waste of your time	15	0.0	0.0	6.7	13.3	80.0	4.73 (.59)

Scale mean = 3.29 (St.Dev.=.95)

- Internships as well as part-time jobs are what really provide you with applicable job skills. Some of the knowledge you have comes from the courses you take, but I would say the vast majority comes from learning on-the-job.
- Increase the number of internships available to students.
- I decided to do one on my own; no one told me of the importance of one, now I'm finding that I should have done it for a longer period of time; internships need to be stressed more. All employers seem to want someone with more experience.
- They are a very useful tool in preparing students to be competitive in the job market.
- It is a must for people in fisheries and wildlife the experience was very meaningful
- I feel the Fisheries and Wildlife program needs a required internship to earn a degree
- None, the fisheries and wildlife department run an excellent internship program.
- Require two or three
- The trick to internships is to take them when you can get the most use out of them. Also, it will take several to be useful in career placement.
- None – don't mess with a good thing. The F & W internship program was the best opportunity I ever had at MSU.
- Take advantage of them
- Possibly either pay more or don't charge students to work an internship. A lot of the money you make is used to offset the cost of the internship.

### Involvement in On-Campus Student Organizations, Clubs or Teams

The following are specific comments made by alumni in the Fisheries & Wildlife Science department in relation to involvement in extracurricular activities.

- Great way to make contacts – learn who your resources are and helpful tips for making your name stand out.
- Try, at least. If you find it doesn't interest you, consider it a learning experience and not a waste of time.
- It helps the student to feel more comfortable, it is a source of contacts, getting to know professors and friends.
- Get to know as many people in the field as possible
- Do it, the help build relationships and networks and improve people skills
- Get involved with clubs – it helps make you more confident, find friendships and learn about your career.
- An enriching experience
- Get involved and be active.
- Be involved, these are positive experience. Good people and good times.
- Get involved.
- It is truly the best way to learn about the reality of what is theorized
- May seem like a waste of time and effort now, but in the long run, it will become (one) of the best things you did.
- Join as many as you can!
- Probably is a good experience

### Participation in Overseas Study Programs

There were three persons in the department of Fisheries & Wildlife Science that reported participating in an overseas study program: Environmental Planning and Management - The Netherlands, Overseas courser within the Wildlife department, and ANR San Salvador Island Bahamas.

### Employment information of graduates within the college

Table 10. Length of time to their first position related to their degree (N=33)

How long it took to find their first position	Frequency of Response	%
Less than one month	8	24.2
1 to 3 months	4	12.1
3 to 6 months	2	6.1
6 to 12 months	7	21.2
12 to 24 months	1	3.0
More than 24 months	1	3.0
Never	10	30.3

Table 11. Number of full-time job offer at the time of graduation (N=33)

Number of full-time job offers at graduation	%
One	15.2
Two	6.1
Three	3.0
None	75.7

Nature of Current Employment

Table 12. Nature of employment of graduates (N=33)

Nature of employment	%
Full-time	84.8
Part-time	12.2
Unemployed	3.0

Salary information

**Salary information**

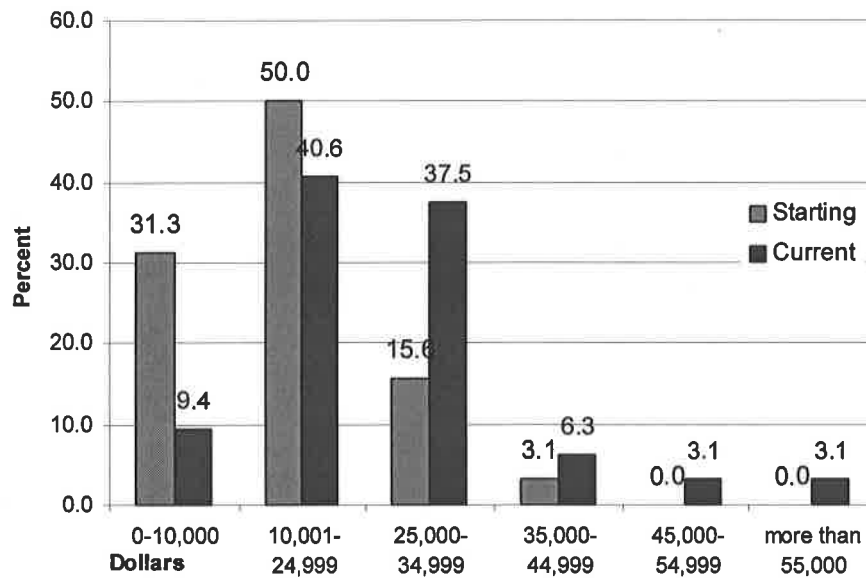


Figure 3.0 Starting and current salary information (Starting annual salary N=32; Current annual salary N=32)

Table 13. Satisfaction with current position

	(N)	Percent					Mean (SD)
		Poor	Fair	Good	Very Good	Excellent	
Challenging work	32	6.3	21.9	21.9	21.9	28.1	3.43 (1.29)
Opportunities for advancement	32	15.6	18.8	12.5	25.0	28.1	3.31 (1.46)
Overall working conditions	32	6.3	15.6	34.4	25.0	18.8	3.34 (1.15)
Salary	32	25.0	18.8	31.3	18.8	6.3	2.62 (1.23)
Your own job performance	32	0.0	0.0	21.9	53.1	25.0	4.03 (.69)

Respondents were also asked a one-item question concerning their overall satisfaction with their present position. Most of the respondents indicated that their overall satisfaction was “good” as shown in Figure 4 below.

Overall satisfaction with current position

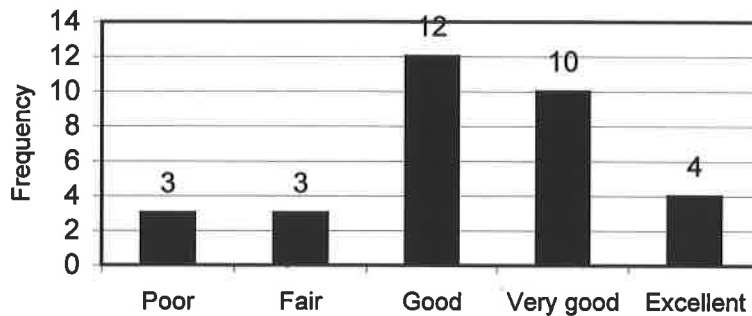


Figure 4. Overall satisfaction with current position N=32

## Assessment of Career Opportunities

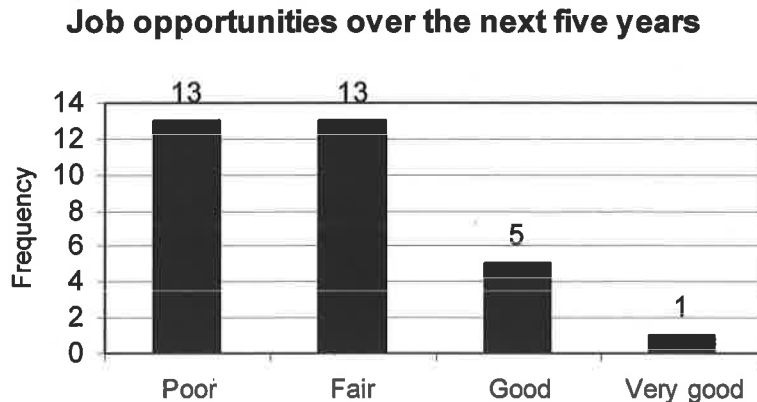


Figure 5. Assessment of job opportunities over the next five years N=32

### Comments about Areas of Additional Knowledge

- I could have learned a how to build a house instead of hug a fish.
- Each student should be encouraged to talk to a faculty member/counselor about their future plans. Some students feel they need to go on to graduate school just because it seems to be the next logical step after undergraduate studies. For some, graduate studies are not needed in their field – others it may be required. Some may find a law degree or dual major to be more useful. Careful help in determining your own needs could save time and money.
- No. Personal situation prevented further pursuit of career an d/or advanced degree (factors: family, finances, age, ability to relocate)
- Real world applications; hands-on experience; allowed to make mistakes.
- Seems like you need to have connections with the right people to get a job with the DEC or DNR. I would have taken more classes about fish science half of the civil service exam relates to fish. Knowing what kinds of jobs were out there would have been nice.
- If I would've known there was such a little demand for environmental employees with reasonable salaries, I would've majored in business. After graduation I received this offer from MSU. Track grouse in the UP for a couple of months, up to 12 hr days for about \$200.00 a month. Thanks FW program.
- I transferred to MSU from a community college, so I only spent a couple years at MSU. I was a commuter to and from school and I wish things were more convenient for older students who don't live on campus.
- What jobs were available to me – more help finding a job.
- A better indication of the differences between theories and simplifications and what is actually in the "real world". A better, more personal introduction to the product of a theory from the process of the scientific method. A more realistic sense of what the process feels like.

- I should have been a part of an internship while I was in school. I did several after I graduated.
- More knowledge about state agencies, DNR, DEQ and how they work and more info on private companies who hire people in my major.
- A required internship would have given me a beneficial experience. Class work doesn't give any field experience which is needed to attain an entry level position. That is why I didn't have a wildlife position.
- Not really. I knew before hand it would just be a challenge to get a job. Getting my foot in the door and proving myself was what I needed. The diploma just made my resume complete. A diploma is just a piece of paper.
- There have been lots of things that I have learned after graduation. They are things that life has taught me and experiences on the job have taught me. As far as classes, sure I could have paid for and taken more classes to improve myself, but I chose to enter the work force. My experience at MSU was a very good experience that I would not trade anything for. (Well almost anything)
- It would have been helpful to realize that there are very few permanent positions available in fisheries right out of college and even after gaining experience. Because of the government connection that most natural resource organizations have, it proves quite difficult to find (not just accept) full-time, permanent employment. Also, more experience with computers would have been helpful.
- Working on communication, interpersonal and management skills
- I sure could use more help from the faculty in finding a position I would actually enjoy and was thoroughly prepared for!
- Very good preparation, more long term curriculum planning would have helped. Lab practice courses, practice set-ups, discipline material gathering.
- I would have liked to have known how low paying jobs were in this field and how hard to come by they are.
- Just how lacking the field really is
- Party less – study more! Aggressively pursue opportunities outside of the classroom to meet and work with professionals in the Wildlife field. Know from day one, that this is an extremely competitive field and that you should plan to prepare for an advance degree MS or PhD because a BS won't get you far.
- No one really tells you that without a more advanced degree, fisheries and wildlife jobs are very limited and extremely hard to find. On the other hand, no one really goes into it with the intention of getting rich!
- Lack of opportunity in the major I'm in.
- More computer skills
- More guidance on career choices would have been very helpful.

#### Additional Thoughts for Improving CANR Programs

- College needs to be more fun! Please try to challenge students in fun, creative, real world situations. Challenge advisors to direct students into programs that they show interest in not just programs that the advisor is representing.
- I remember a lot of reading, formulas, memorizing and labs. Unfortunately, I don't remember a lot of what I learned from these exercises. What I remember the

most are the applications to job skills. Example: I remember studying the bones of animals and learning and memorizing their scientific names. I can barely remember any of that. If my spouse asks me “What kind of hawk is that sitting on that post over there” I can’t tell him even though I was a Fisheries and Wildlife major. We studied the insides more than the outsides – not very practical for undergraduate work – we should focus on the stuff people assume you would know with an undergraduate degree and save the more technical stuff for graduate work.

- Aside from four instructors (...) I was very disappointed in professors’ ability to “teach” interestingly enough all these teachers used the chalkboard rather than overheads. It is obvious that some professors place instruction secondary to other departmental obligations, i.e., Administrative responsibilities, research, publication, committees. Perhaps more emphasis needs to be placed on instruction. FW degree pursuit not conducive to the new “market” of students who are older, have family and 8-5 job. Courses that I would not take again: computer programming, ecosystem processes.
- Businesses want experience. Hands-on training is a must. Internships are not always the answer for this type of training. That just puts more time commitments on the students. MSU overall, I feel is a good school. Way too much time and money is wasted on being politically correct and trying to place everybody. Catch up with times. People can take care of themselves. The college I went to has some great instructors but need to get some excitement in our lectures.
- I don’t mean to sound bitter about my education and MSU. I am very happy with my current position. However, I worked extremely hard to be where I’m at today with little or not help from the Fisheries and Wildlife program. The only thing my degree has done for me is to show that I am willing to work hard for 4 plus years to achieve a piece of paper that is required by most employees.
- More tutoring and peer mentor - FREE programs for students who are not minorities.
- My experience was great
- Required internship for F & W degree
- To me, college is a way of weeding out serious students from ones who are not. Four years of torture and fun can do a lot for someone, and I would not ask to trade that in. However, more on the job training opportunities are needed because this is where you learn what you need to know. Other than that I wouldn’t change much.
- Go green! Go white!
- More computer training – general stuff concerning basic operations should be required. Further time spent analyzing issue and conflict management as well as constituency recognition and communication. The fisheries program at MSU has seemingly prepared me for a master’s degree/biologist position because of the programs emphasis on the analysis of data rather than the collection of it. It is difficult to get a chance to interview (in fisheries) for biologist positions because I lack a master’s degree. The education I received, however, focuses on biologist’s tasks as opposed to technician’s tasks. A bachelor in fisheries seems to prepare you for a biologist position while not enabling you to interview for that position.

An expensive irony. Possible, allowing students to pursue a technical (field study) emphasis or an analytical emphasis in fisheries science may be helpful.

- More group work, business skills
- Work with the University course requirements to determine if any classes related to the student's field can be substituted while still maintaining the university competence in that area. My schedule was too filled up with university requirements so that I wasn't able to take more courses in my field of study (that would have been more useful) and still finish in 4 years. Capstone course (ANR 489) should be earlier in the student's career. Mandatory computer applications course early in the student's career so they can use it for the remainder of their stay at MSU. Not a programming course, but a course that covers the fundamentals of what a computer consists of and different operation environments/programs. I.e. How to work Windows 95, word processing packages such as Word, WP, spreadsheets such as Quattro Pro, Excel. This would greatly improve the quality of class reports and give instructors more flexibility to explore/teach computer based applications and how they relate to the student's field of study.
- Classes that weren't necessary: comparative anatomy, economics (at least not the gargantuan univ. sections!) I think offering classes in interpretation; child development would be valuable and offer graduates many more job opportunities.
- The math and chemistry departments need major work. The biggest problem with the math department is the language barrier with instructors and TA's. Most can't understand or speak English well. Chemistry faces some of these problems too. To sum it all up. It was the professors who were dynamic in their teaching styles that made a difference. Too many professors were dull, never changing, out of touch and cookie cutter. There needs to be better evaluation of professors.