



*Original Article*

# An Online Fisheries and Wildlife Degree: Can You Really Do That?

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**ABSTRACT** Online education has moved into the mainstream in the United States higher learning educational system, with enrollments increasing more rapidly than on many university campuses. The Department of Fisheries and Wildlife at Oregon State University began offering a Bachelor of Science (BS) Degree in Fisheries and Wildlife Science (FWS) completely online in autumn 2009, which resulted in numerous questions from potential students, educators, and fish and wildlife professionals. We provide an overview of our distance education (DE) degree and characterize our DE learners. The DE degree itself is the same as the on-campus major but the curriculum is slightly different; online students have fewer choices in classes and hands-on activities, but engage in more discussion than on-campus students. Our DE students differ from on-campus majors: they are on average 9 years older, 40% have a college degree, and 20% are employed by a natural resources agency. The value of our online FWS BS ultimately will be gauged by the success of our graduates and feedback from stakeholders. © 2011 The Wildlife Society.

**KEY WORDS** college education, curriculum, distance education, knowledge, online, skills, training.

Interest in distance education (DE) and the application of DE technologies for delivery of courses and curricula has increased substantially over the past decade. In 2009, participation in online courses and curricula increased 17% in a single year, a rate substantially above on-campus enrollment (Allen and Seaman 2010). Over 4.6 million students in the United States were enrolled in online courses in 2009, and about 25% of all university students took  $\geq 1$  courses online (Allen and Seaman 2010). The University of Phoenix, a mostly online university, has the highest undergraduate enrollment in the nation. Federal natural resource agencies are increasingly relying on DE methods for delivering continuing education programs needed by the profession and for providing professional development credits for certification by The Wildlife Society, American Fisheries Society, and Society for Wetland Scientists. The United States Fish and Wildlife Service National Conservation Training Center increasingly relies on DE technologies for delivering their programs;  $>10\%$  of the center's courses are offered using DE delivery methods (National Conservation Training Center 2010). The Bureau of Land Management National Training Center has used DE methods since 1998; all 78 training programs completed since 2007 ( $>300$  hr) are delivered using DE methods and another 65 DE learning projects are in progress (T. Joseph, Bureau of Land Management, personal communication).

Growth in DE programs at Oregon State University (OSU) has mirrored the national trend. Over 700 courses were offered online at OSU in 2009 and about 3,600 students were enrolled in  $\geq 1$  DE class per term (L. Templeton, OSU, personal communication). Faculty in the Department of Fisheries and Wildlife at OSU adopted DE technologies early. The department went from a single video course in 1995 (reviewed by Cross 2000) to 33 undergraduate courses during autumn of 2010, with another 4 in production. In autumn of 2009 we offered the first online Bachelor of Science (BS) degree in Fisheries and Wildlife Science (FWS) in the nation, and by autumn 2010 we had 153 online majors, representing a 37% increase in undergraduate majors in 1 year. By 2009, 42% of the undergraduate FWS majors graduating in the past 3 years had taken  $\geq 1$  DE class (Edge 2009). Oregon State University now offers 3 natural resource-related BS degrees online (Environmental Sciences, FWS, and Natural Resources).

The advent of our online FWS degree resulted in numerous questions from potential students, educators, and fish and wildlife professionals including The Wildlife Society Certification Review Board. Questions included: How did you develop an online Fisheries and Wildlife degree? How can a field-oriented degree be delivered online? Is this the same degree that you offer on campus? Who are the students pursuing this degree? How do students acquire the knowledge, skills, and abilities that natural resource agencies need in new employees? Here we address these questions. We provide an overview of the development of our online degree including financial support and faculty incentives and explain the major components of our degree, including

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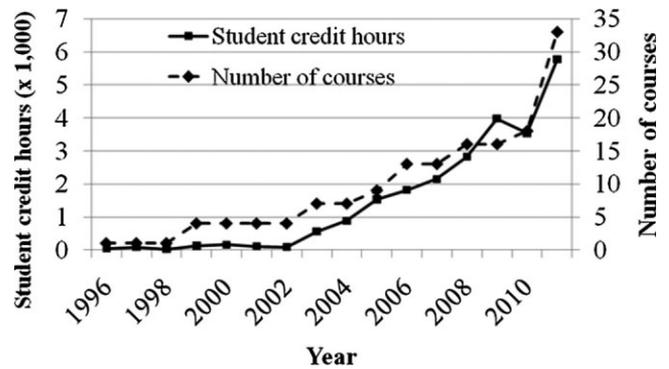
field experiences. We provide details about who our online students are and how they differ from on-campus students. Finally, we discuss some of the advantages of our DE degree relative to the knowledge, skills, and abilities required by natural resources agencies.

## DEVELOPMENT OF AN ONLINE DEGREE

Our DE program developed opportunistically for the first several years. Our first DE class, “Principles of Fish and Wildlife Conservation,” was developed in 1994 as a satellite broadcast and then as a video course in 1995, supported by grants from United States Department of Agriculture, Higher Education Challenge Grants, and the American Distance Education Consortium (Diebel et al. 1998, Edge and Loegering 2000). This class was also offered as an advanced placement class in high schools in Oregon and Washington (Loegering and Edge 1999). On-campus support in the form of financial, teaching methodology, and marketing for DE at that time was minimal; OSU had a mechanism for enrolling students, but little other support was available. The department did its own marketing and website development, provided technical support to students via email and toll-free phone line, and used locally developed software for interacting with the students. Other video classes followed within a few years, including “Wildlife in Agricultural Ecosystems,” “Biology of Birds,” and “Multicultural Perspectives in Natural Resources,” all supported by grants from United States Department of Agriculture, Higher Education Challenge Grants, the American Distance Education Consortium, and the Natural Resources Conservation Service (NRCS). We rented and shipped Video Home System tapes and later Digital Video Disks as a means of delivering course content throughout the country for several years.

By 2000, OSU began to offer incentives and provide substantial support for developing and delivering DE classes and curricula. Oregon State University Extended Campus (EC) was established to facilitate development and delivery of classes and to recruit and advise DE students. As OSU faculty developed new courses, EC provided DE instructional designers, multimedia development teams, and copyright specialists to aid faculty in the development of their courses. Distance-education students had access to advising specialists and technical support specialists to assist students in some of the technological challenges of learning online. Oregon State University adopted Blackboard® (Blackboard Inc., 2010) as its class management software, which substantially enhanced our content delivery and interactions with DE students and allowed DE students to more effectively communicate amongst each other.

The incentives at OSU, online curriculum development, and the department’s strategic planning resulted in rapid growth of our DE program over the past 10 years (Fig. 1). Two of the first online degrees offered by OSU in the early 2000s were BS degrees in Environmental Sciences and Natural Resources. After our initial DE classes, we began to make strategic decisions regarding what classes



**Figure 1.** Number of online classes and student credit-hours by year for classes offered by Oregon State University’s (Corvallis, OR, USA) Department of Fisheries and Wildlife (1996–2010).

to target for future development, focusing on classes that meet general education requirements or are offered as part of a minor in FWS. Because we were one of the first departments at OSU to provide substantial online content, almost all online students at OSU in the early 2000s took some of our classes, and many of the Environmental Sciences and Natural Resources majors completed a minor or option in FWS. We hired content specialists to develop new DE classes; 7 of our DE classes have never been taught on campus and because of declining state support, 2 other elective classes that we previously delivered on campus are now offered only online. By 2008, we were well-positioned to begin offering our FWS BS degree online and received a grant from EC to develop the remaining classes needed for the curriculum and to hire advising staff to advise online students. We began offering our BS in the autumn of 2009 and by January 2010 we had about 100 students in the major, many of whom switched from the Environmental Sciences and Natural Resources programs. We continued to receive 2–3 inquiries per week throughout 2010 and by autumn 2010 we had 152 students enrolled in the online major. By spring 2011 our FWS BS will be completely available online when our senior capstone courses are completed.

## FUNDING ONLINE COURSES AND DEGREE PROGRAMS

Online education has developed most rapidly at universities that have made strategic investments developing online courses or degrees, and universities that have adopted funding models that share revenues among participating programs. In OSU’s case, EC has operated under a revenue-sharing model for >10 years. Students registering for online classes pay resident tuition (regardless of where they reside) plus a per-credit-hour DE fee. The fees directly support EC and the tuition is shared on a 10:10:80 (university/EC/college offering course) model. These revenues allow departments to hire instructors, teaching assistants, and pay faculty overload compensation or summer salary. Extended Campus also provides resources for course and program development and college and departments match those resources so that faculty may receive up to

2 months of salary to convert a course to DE formats. Extended Campus also provides a stipend to the participating departments to provide advising support for online students. Courses have also been developed using grants from United States Department of Agriculture, Higher Education Challenge Grants, the American Distance Education Consortium and National Science Foundation.

### Incentives for Faculty Participation

Developing and maintaining a DE degree program requires substantial participation from faculty, who are reluctant to engage without incentives. As previously mentioned, we provide up to 2 months of salary to develop a course and revenues from teaching a course can be used for overload compensation, summer salary, or can be saved in salary savings accounts for other purposes (i.e., hire research assistants, to purchase supplies and services, etc.). Faculty may also hire Graduate Teaching Assistants (GTAs) who teach classes with faculty supervision. Most faculty have opted to use GTAs for online instruction; our department has no state-funded GTAs, yet most tenure-track faculty have 4 terms with  $\geq 1$  GTA support per year, and 3 faculty members can support 2 GTAs year-round. This GTA support has provided important teaching opportunities for graduate students where few opportunities previously existed, as well as substantial flexibility for faculty in supporting their graduate students.

Developing and teaching online courses provide faculty with other, often overlooked benefits. Grants written in support of course development, especially those from highly competitive federal programs, are recognized as scholarship in the promotion and tenure process and during annual evaluations. Some faculty become interested in the science of education, and they publish peer-reviewed articles detailing experiences with DE or comparisons between on-campus and online classes. Materials developed for DE classes are readily used to support college, university, and national teaching award nominations. Finally, once developed for

online delivery, DE materials can be used for hybrid courses on campus, providing faculty with additional flexibility while teaching. Faculty with these materials can substitute online lectures and discussions into on campus classes if they need to attend a conference or research meeting out of town.

## COMPONENTS OF OUR ONLINE DEGREE

We offer the same degree online as we do on campus, but there are differences in course availability. Furthermore, transcripts issued by OSU do not specify whether a course or degree was taken online, as is the case for all universities we are familiar with. By spring term 2011, all required classes will be available online, except for laboratory biology and speech, which students must take at a local university or community college. The availability of our elective classes differs on- and off-campus; 14 classes are available only on campus and 9 are available only online. Our curriculum (Table 1) has 7 categories of classes (e.g., vertebrate biology and systematics, human dimensions) where students must choose 1–3 classes from each category, consistent with the concept of bounded choices suggested by Millenbah and Wolter (2009). Currently, the online list of classes in these categories has fewer choices than are available on campus, but in all cases the list of online classes provides students with several classes to choose from (Table 1). All of our students are required to propose an area of specialization of 24 credits (5–8 classes) that provides breadth or depth in an area of career interest (e.g., endangered species management, fishery biology, marine biology, environmental education), a requirement we have implemented for >15 years that was recently suggested by Millenbah and Wolter (2009) as a means of providing both direction and flexibility to “millennial generation” students. Our DE students can take appropriate classes online or on campus from any accredited university, and the Natural Resources Distance Learning

**Table 1.** Oregon State University (Corvallis, OR, USA) Fisheries and Wildlife Bachelors of Science curriculum and availability of classes for on-campus and online majors.

Curriculum component (no. of classes required)	No. of credits	No. of courses available		Comments (no. of potential courses available at Natural Resources Distance Learning Consortium <sup>a</sup> )
		On campus	Online	
Baccalaureate core (9)	24	>375	98	
Communications (2 writing, 1 speech)	9	4	3	Must take speech at a university or community college (1)
Fisheries and wildlife core (20)	159–180	19	16	Must take laboratory biology at a university or community college (8)
Physical or earth science (3)	9–12	37	8	(44)
Human dimensions (3)	9–12	37	18	(30)
Vertebrate biology–systematics (3)	7–8	7	4	6 classes by spring 2012
Habitat and ecosystems (1)	3–5	10	5	7 classes by autumn 2011 (14)
Species conservation and management (2)	6–8	7	4	(2)
Behavior and physiology (2)	6–8	9	2	4 classes by autumn 2011 (3)
Genetics and evolution (1)	3–4	7	2	3 classes by autumn 2011 (3)
Specialization (6–8)	24			Specializations are designed by student to provide special training in area of career interests—course availability depends on specialization

<sup>a</sup> Based on course titles; syllabi have not been reviewed by department curriculum committee.

Consortium (<http://www.nrdlc.iddl.vt.edu/>) offers >500 classes, many that might fit in either of our curriculum categories or specialization classes. Furthermore, the EC funding model allows us to offer most of our 33 DE classes  $\geq 2$  terms per year; 14 of our classes are offered 4 quarters per year, providing both on- and off-campus students with substantial flexibility in scheduling. In contrast, we offer 47 classes on campus annually or biennially; with 1 exception, none of these classes are offered >1 term per year.

Our online and on-campus degrees both focus on learner outcomes that address knowledge, skills, and abilities that professionals have identified as being necessary for natural resource professions. These knowledge, skills, and abilities include oral and written communications, interpersonal communications, critical thinking, leadership and teamwork skills, policy, and human dimensions of fish and wildlife management (Bleich and Oehler 2000, Baydack et al. 2009, Millenbah and Wolter 2009, Stauffer and McMullin 2009, The Wildlife Society 2009), in addition to knowledge related to biology, ecology, and management of plants, animals, and ecosystems.

### **Incorporating Field and Laboratory Components**

We are frequently asked how our online degree incorporates field and laboratory exercises. About 40% of on-campus classes have field exercises or trips where students collect data; observe fish, wildlife or plant communities; look at management practices; or discuss management issues with professionals in a field setting. Thirty-six percent of our online classes offer the same types of field experiences, but typically they are self-directed experiences. Forty-three percent of on-campus classes have laboratory exercises where students examine specimens, manipulate data, work with specialized equipment (i.e., microscopes, sampling devices), and conduct experiments. Only 20% of our online classes offer similar experiences and the specialized equipment is not required. However, the percentage of online classes with labs will increase to 31% when our last 6 classes are completed for online delivery. We will also address this need by developing online classes with a hybrid delivery mode, where the students will complete the lecture materials and discussions online and will participate in an intensive 2- to 4-day laboratory and field experience at a field station with on-campus students. In the end, hands-on classes (either labs or field activities) will represent 60% of on-campus classes and 50% of our DE classes, both of which compare to the average ( $49.0 \pm 22.2$ ) for hands-on classes in curricula for National Association of University Fish and Wildlife Program member institutions (Wallace and Baydack 2009).

Field and laboratory components can be incorporated into online classes in a number of ways, but instructors must think creatively about how to best achieve the learner outcomes associated with the exercise. We offer a few examples of field and laboratory exercises from our online classes. Our “Field Sampling of Fish and Wildlife” course (FW 255) requires students to develop their own study and measure, count, or assess different resources (animals, plants, or

habitat components) based on factors including fish, wildlife, and habitats in their area and transportation availability. Once the students have worked with the instructor via email, online discussion or telephone, to refine the design, students go into the field to collect project-specific data  $\geq 1$  time per week for  $\geq 4$  weeks, and also collect other general site-level observations  $\geq 2$  times per term. Along with the field project, students also complete a unit on basic naturalist journal keeping, observation, and sketching. Students are required to be in the field weekly throughout the term recording general observations. Our “Systematics of Birds” class (FW 312) requires students to complete online laboratory exercises that focus on bird anatomy and visual recognition of 125 bird species. Students must join a local birding group, participate in birding trips, and submit a journal of the birds observed and the name and contact information of the group leader, who verifies student participation and the species observed by the group. Our “Wildlife in Agricultural Ecosystems” class (FW 435) requires students to work with a local farmer to develop a wildlife conservation plan for a property that incorporates the landowner’s fish and wildlife objectives into a working farm. Students locate farmers by visiting with local NRCS biologists, state wildlife agency biologists, or family contacts. This assignment requires the students to visit the farmer and farm on several occasions to understand operations on the farm, farm goals, and farm habitats. Many of these conservation plans have been submitted to state and federal agencies to meet requirements for participating in conservation incentive programs (e.g., NRCS Wetland Reserve Program) or to assist in specialty certifications like Oregon Tilth (2010) and Salmon Safe (2010). In addition to field and laboratory exercises with our content-oriented classes, all of our students must complete  $\geq 2$  internships, which have been identified as critical for experiential learning and developing field skills (McDonald et al. 2009, Miller et al. 2009, The Wildlife Society 2009). These internships are among the best educational experiences for our students and provide them with more field experience than we can offer during classes during their entire degree program.

Of the 2 required, the longer term internships can be challenging to develop for online majors because many work full time. Our Internship Coordinator works with students to develop an appropriate experience that provides professional training while fitting into students’ schedules. Many students have flexible schedules and can participate in an internship 1 or 2 days per week over a long period. Some use weekends and vacation time over a longer period, and many are waiting until near the end of their degree so they can make a career switch all at once. Many of those already working in the profession set up an internship with the biologist in the position that the student wants to get when they graduate or they use it in some fashion to facilitate career advancement. We also offer a 1-credit exploratory internship to attend professional meetings. In 2010, we had DE students attend the state chapter meetings of TWS in California, Tennessee, Missouri, and

Oregon; for each, our Internship Coordinator contacted the local TWS executive board and arranged a “mentor” for each student.

## **WHY ARE STUDENTS ENROLLING FOR ONLINE DEGREES AND TAKING ONLINE CLASSES?**

Students enroll as DE majors and take our DE classes for several reasons. The primary reason many students pursue online degrees is access. The classic DE learner is place- or situation-bound and cannot attend college because he or she is working full time, raising a family, or has other family situations that do not allow moving to another community to attend college (Mayadas et al. 2009). In addition, our DE classes have increased access for on-campus majors; an increasing number are taking classes online because of flexibility of scheduling and because some of our courses are only offered online. As mentioned previously, most of our online classes are offered  $\geq 2$  terms per year, whereas only 1 of our on-campus classes is offered more than once per year. Forty-two percent of the students in our past 3 graduating classes had taken  $\geq 1$  DE class and 19% had taken  $\geq 3$  DE classes (Edge 2009). Nationally, 25% of all university students in the United States took  $\geq 1$  online class in 2009 and most of these students were not online majors (Allen and Seaman 2010).

Many students simply prefer to learn online instead of in a classroom. Contemporary students are proficient with the common technologies used for delivering classes online. Many have grown up interacting with computers as a mode of communication and community building (Goodwin-Jones 2005), and an increasing number of K-12 students in the United States have taken online classes before they come to college (Means et al. 2009). Online classes allow students to learn at a time and location that best fits their schedules and life styles.

Cost might be another reason some students elect to learn online. Online students pay resident tuition plus a DE fee at OSU regardless of where they are. This tuition structure reduces the total cost of education for nonresidents located on campus and may substantially reduce education costs for situation-bound learners because they do not have to move to a university community and pay for lodging while maintaining a permanent residence elsewhere.

## **WHO ARE OUR ONLINE STUDENTS?**

Our population of DE majors differs substantially from on-campus majors. More online majors are females (56%) compared to males (58%) for on-campus students. We have more underrepresented students on campus (11%) than online (8%), although these statistics are problematic for both groups because an increasing number ( $>30\%$ ) of our students decline to classify themselves as to race and ethnicity. Our online learners are on average 9 years older than on-campus learners ( $\bar{x} = 32$ ,  $SD = 8$ , online;  $\bar{x} = 23$ ,  $SD = 5$ , on campus). Forty percent of our online majors are seeking a second Bachelor's degree compared to 8% for on-campus majors. A higher proportion of our online majors

(76%) report addresses with urban zip codes than on-campus majors (63%; U.S. Census Bureau 2010).

Our online majors differ from on-campus students in other important ways. Forty-two percent of our online majors work full time, whereas none of our on-campus learners work full time except during the summer or when they take a term off to earn money for their education. Also, 20% of our online majors already have jobs with natural resource agencies; on-campus majors work for natural resource agencies only during the summer or when they take a term off to earn money. More than 21% of our online majors have children, whereas only a few of our on-campus students do. As a consequence, only 37% of our DE majors were enrolled full time ( $\geq 12$  credits) for autumn 2010 compared to 85% for on-campus majors.

Based on the experiences of our faculty who teach online classes, our DE majors appear to have other attributes that differ from typical on-campus students, although we have not tried to quantify these differences. Online majors appear to have better writing skills than on-campus learners, probably because many already have an undergraduate degree, suggesting they are more educationally experienced and more proficient writers. Because DE majors are more mature and many have already been successful in college, they appear to have better developed study skills and appear to be more engaged in their classes than are on-campus majors. A higher level of engagement may also be due to the part-time enrollment status of many DE students; these students are taking only 2–3 classes per term and invest more time in those classes, than we typically see with on-campus majors. Means et al. (2009) noted that DE learners typically outperform face-to-face learners, but suggest that differences may be a function of content, pedagogy, and learning time. Finally, our DE majors bring important life experiences to the classroom; students currently serving in the military in Afghanistan and Iraq or currently working for a fish and wildlife agency likely have different, and probably more realistic, perceptions regarding natural resources than our typical on-campus major.

## **Broadening Participation**

Another important aspect to consider in designing DE courses and curriculum is who else might be included in our online student population in the future, provided we are successful in 1) building relationships in underserved communities and 2) mindfully designing support mechanisms to foster student success. Although the natural resource professions have recognized and attempted to address underrepresentation issues since at least the 1970s, progress toward a fully representative workforce has been slow (e.g., Davis et al. 2002, Keefe and Young-Dubovsky 1996, Pierotti 1996). However, online-only or innovative hybrid programs (e.g., summer gatherings on-site in a community plus online coursework during the academic year) might provide an effective mechanism by which to engage future researchers and managers from the communities and backgrounds absent from many research, management, and policy-making institutions. For example, online delivery of our program

allows us to meet prospective learners who are place-bound by employment, family obligations, or a cultural identity that encompasses close geographic and social association with their home place, such as many belonging to Native American cultures (Nichols and Stenberg Nichols 2008). Furthermore, many prospective learners spanning ethnic, racial, and cultural spectra may be place-bound in areas lacking access to higher education in fisheries and wildlife (or any natural resource field) as a result of the legacy of socioeconomic and socio-geographic forces that affected their parents and grandparents. For these prospective ecologists, online education may provide the best way to gain an education but also the crucial links to the people, culture, and “insider network” associated with success in the fisheries and wildlife field. Seitz and Sutton (2010) reported increased diversification and access to a fisheries program in Alaska that was made available throughout the state using DE technologies.

### **Developing Important Skills and Abilities**

There are some important differences with online instruction that help students develop skills and abilities important for the fish and wildlife professions. Most of our online classes require students to participate in weekly discussion forums and these discussions typically are focused on critical evaluation of papers, issues, or data. Because these discussions are weekly requirements, all students participate, which differs substantially from on-campus discussions where many students never contribute. Furthermore, because online students typically have a week to engage in these discussions, many read supplemental materials and think carefully before responding; their responses frequently run several paragraphs. This level of engagement provides online learners with practice at writing and critical thinking. As a result, the incorporation of learner reflection in online classes leads to improved learning outcomes (Nelson 2007, Bixler 2008). Another advantage with our online classes is peer-to-peer teaching, which does not happen frequently in on-campus classes. Not only are 20% of our online majors already employed by natural resource agencies, but many of the students enrolled in our DE classes are non-degree-seeking professionals who are taking classes for professional development and professional society certification. For example, our “Wetlands and Riparian Management” (FW 479) and “Integrated Watershed Management” (FW 326) classes always have federal hydrologists and watershed managers enrolled each term we teach them. Consequently the discussion forums are commonly replete with real-world experiences and observations. Furthermore, because all DE students rely on technology for participating in classes, they are proficient with presentation and communication technologies (e.g., Skype<sup>TM</sup>, social networking, chatrooms, video software, distance-meeting software; Goodwin-Jones 2005) that most natural resources agencies are adopting to conduct business and reduce costs.

## **CONCLUSIONS**

The FWS degree we offer online is essentially the same degree that we offer our face-to-face students with some minor differences. Distance-education programs will offer FW majors unprecedented choice in the future if, as Mayadas et al. (2009) suggest, all but very elite colleges will engage in DE teaching and all but very specialized degrees will be offered online in the future. Our DE curriculum has fewer hands-on (field and laboratory) activities than our face-to-face curriculum does, but is comparable to the average for hands-on classes in fish and wildlife program curricula at National Association of University Fish and Wildlife Program member institutions (Wallace and Baydack 2009). Furthermore, the 2 internships we require undoubtedly offer better opportunities for developing field- or laboratory-related skills than a few hours during a term might. As McDonald et al. (2009) observe, showing someone biotelemetry equipment during a class exercise is not the same thing as using the equipment regularly throughout a summer. Our DE majors are engaged in discussions more frequently than our face-to-face learners and, therefore are more regularly engaged in synthesis and critical thinking activities. Finally, our online majors are more reliant on technology to learn than on-campus majors, which may result in enhanced engagement (Millenbah and Wolter 2009) as well as development of distant communication and community networking skills that are needed by natural resource agencies today.

Ultimately, the value of our online FWS BS will be gauged by the success of our graduates and feedback from stakeholders. We conduct periodic surveys of stakeholders regarding preparation of our graduates and will be collecting data regarding our online students within the next 3 years. Workforce planning is a huge issue in the natural resource market place (National Research Council 2000, Julian and Yeager 2002, U.S. Department of Commerce and U.S. Department of Education 2008, Berkson et al. 2009) because many employees who were hired as a result of increasing environmental regulation face retirement. Our DE degree will provide us with increased capability in meeting these demands. Furthermore, given that about 20% of our online majors already have jobs with natural resource agencies, our DE degree is providing important professional development opportunities for the existing workforce.

Distance education offers an unprecedented opportunity to collaborate with other universities in delivering high-quality degree programs. As Millenbah and Wolter (2009) point out, faculty in FW programs around the country are becoming more and more specialized and fewer new faculty members are capable of teaching lower division survey classes. Distance education offers the opportunity to address this concern, as well as to take advantage of these subject-area specialists. Furthermore, the wide breadth of topics that successful FW professionals need (Bleich and Oehler 2000, Baydack et al. 2009, Millenbah and Wolter 2009, Stauffer and McMullin 2009, The Wildlife Society 2009) make it more and more difficult for any one program

to deliver a course on every topic, especially at a time of declining support for natural resource programs.

We believe that DE will become a common approach for training fish and wildlife professionals in the future. Concerns regarding our ability to train professionals in a field-oriented career largely come from people who are unfamiliar with DE technologies. We encourage you to take or teach a DE class before passing judgment—we have not met anyone who has taught online who retains the notion that it is not an effective way to educate learners.

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