

**LEADERSHIP AND MANAGEMENT OF WILDLIFE REINTRODUCTION  
PROGRAMS**

A Thesis

by

ALEXANDRA E. SUTTON

Submitted to the Office of Graduate Studies of  
Texas A&M University  
in partial fulfillment of the requirements for the degree of  
MASTER OF SCIENCE

August 2009

Major Subject: Wildlife and Fisheries Sciences

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Approved by:

Chair of Committee,	Roel R. Lopez
Committee Members,	Thomas E. Lacher, Jr.
	Gerard T. Kyle
	Jean A. Madsen
Head of Department,	Thomas E. Lacher, Jr.

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## ABSTRACT

Leadership and Management of Wildlife Reintroduction Programs. (August 2009)

Alexandra E. Sutton, B.S., Howard University

Chair of Advisory Committee: Dr. Roel R. Lopez

Wildlife reintroduction programs are a type of conservation initiative meant to preserve biodiversity through the restoration of damaged areas and the reintroduction of extirpated species. Unfortunately, such reintroductions have a history of limited success, *ad hoc* procedures, and little focus on hypothetico-deductive design. This study sought to identify some of the trends in the leadership, management, and structure of wildlife reintroduction programs through the use of a case study and survey. The survey was distributed to reintroduction practitioners and biologists worldwide in an attempt to identify patterns of organizational behavior within the field. Some general trends indicated that most reintroductions had active and monitoring phases of 4 or more years (59% and 75% of respondents respectively), adhered closely to World Conservation Union (IUCN) Reintroduction Guidelines (43% of respondents), had a somewhat hierarchical structure (50% of respondents), held annual long-term goal-setting meetings (56%), observed annual employee evaluations (63%), and underwent project evaluations annually, using both internal (74%) and external (39%) evaluative instruments. Opinion questions regarding the ultimate performance of the project indicated that although 75%

of researchers felt that their project had made good progress, only 63% said that a formal evaluation had confirmed this statement.

## **DEDICATION**

Dedicated to my family and LSWWC

## ACKNOWLEDGEMENTS

I would like to thank my committee chair, Dr. Roel R. Lopez, and my committee members, Dr. Thomas E. Lacher, Jr., Dr. Gerard T. Kyle, and Dr. Jean A. Madsen, for their guidance and support throughout the course of this research. Special thanks go to Dr. Gillian Bowser, for her help, mentorship, guidance, commentary, and research support; and to Dr. George A. Middendorf, for his encouragement, his guidance, his mentorship, and his kindness. Thanks also to Dr. Robert McCleery for his invaluable contributions.

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**NOMENCLATURE**

CBP	Community-Based Program
EC	Experience Characteristics
ET	Experience Type
ETH	Experience Theme
ICDP	Integrated Conservation and Development Program
JNCC	Joint Nature Conservancy Council
NCC	Nature Conservancy Council
RSPB	Royal Society for the Protection of Birds
SERP	Sea Eagle Recovery Project
SEPT	Sea Eagle Project Team
SNH	Scottish Natural Heritage

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## CHAPTER I

### AN INTRODUCTION TO REINTRODUCTION BIOLOGY

#### BACKGROUND

The goal of this chapter is to provide the reader with a brief history of reintroduction biology, as well as an introduction to current issues and challenges facing the field. This project was designed specifically to address an apparent paucity in the literature regarding the human dimensions of reintroduction biology. In order to present that paucity in context, an introductory understanding of the field is required. To that end, the next chapter offers a review of reintroduction literature, introducing some of the history and current status of reintroduction biology, and identifying some key areas which future research might be beneficial to the field as a whole.

#### OBJECTIVES

The objectives of my study were to explore in-depth the organizational structure of the Sea Eagle (*Haliaeetus albicilla*) Recovery Project, as well as to use a survey instrument to identify patterns of organizational behavior across a variety of wildlife reintroduction programs. The first chapter of this thesis has served as an introduction to the history and current status of reintroduction biology; the next chapter, a case study of the Sea Eagle Recovery Project, will explore in-depth some of the particular issues that may arise within a reintroduction project. The subsequent and final chapter, publishing the results of a survey of reintroduction practitioners and biologists, will attempt to identify some variables that may contribute to reintroduction success.

---

This thesis follows the style of Conservation Biology.

## LITERATURE REVIEW

Reintroduction biology is a discipline within conservation biology, a synthetic science with the ultimate goal of promoting, restoring, and maintaining the world's biological diversity (Groom et al. 2005). The World Conservation Union (IUCN) defines a reintroduction program as “an attempt to establish a species in an area that was once part of its historical range, but from which it has been extirpated or become extinct” (IUCN 1998:6). The reintroduction of species for the purpose of conservation has only recently become a management goal (Seddon et al. 2007). Thus, reintroduction biology remains a relative newcomer within the broader field of conservation sciences (Sarrazin and Barbault 1996; Seddon et al. 2007).

### **Reintroduction Before Conservation: Restocking and Recreation (1700–1900)**

Reintroduction biology has its roots in animal domestication, livestock and wildlife management, restocking of wild game and the experimental release of captive animals (Morris 1986). Early wildlife management practices and laws were driven primarily by sport hunters, who sought to maintain populations of wild game for recreational purposes, sometimes in connection with hunting estates, ranches, or plantations.

In Britain, the release of populations of popular game (such as pheasants) was common practice on hunting estates; one of the earliest recorded restocking campaigns was the 19<sup>th</sup> century release of capercaillie (*Tetrao urogallus*) in England, restoring a population which had been extirpated in approximately 1785 (Morris 1986). The 19<sup>th</sup>

century in Britain also saw the reintroduction of the roe deer (*Capreolus capreolus*) and red squirrel (*Sciurus vulgaris*), both for recreational reasons (Bertram and Moltu 1986).

In the United States, hunting ranches and plantations continued to be popular throughout the early 19<sup>th</sup> century, particularly in the South, and these were often the sites of wildlife releases for the purpose of recreational restocking. As the century drew to a close, however, the Civil War and subsequent period of Reconstruction took focus away from recreation in the South, bringing an end to many of the hunting plantations. In the meantime, the Gold Rush and westward expansion led to the development of a new land ethos in the Western United States, and sportsmen, ranchers, and settlers became leaders in the field of wildlife management. The beginning of this era was marked by the establishment of Yellowstone National Park in 1872, and continued with the passing of the Lacey Act, the first Federal wildlife protection act, in 1900. The Lacey Act restricted the transport of illegally killed animals, laying the foundation for later wildlife protection laws such as the U.S. Endangered Species Act (National Research Council 1995).

### **Reintroduction in the Era of Conservation: Pioneering and Introduction (1901 - 1960)**

As the United States and United Kingdom began to transition into an era of increased wilderness awareness, more attention began to be paid to wildlife. Thus, one of the earliest examples of an actual reintroduction project is the 1907 release of 15 American bison (*Bison bison*) into a reserve in Oklahoma (Kleiman 1989; Beck 2001). The release required planning, study of the animals and their needs, legislation, and post-release monitoring, many of the key aspects of reintroductions today.

However, many of these early reintroductions were undertaken simply as opportunistic management exercises; they generally relied on little planning or preparation of animals for reintroduction, and sometimes used inappropriate founder animals (e.g., wildlife confiscated from illegal pet trade, surrendered exotics, etc.) (Seddon et al. 2007, Armstrong and Seddon 2008).

### **Reintroduction in the Era of Conservation: Awareness and Exploration (1961 – 1988)**

Early reintroduction projects after 1961 continued the tradition of opportunistic, recreational, and *ad hoc* releases. However, as the decade progressed, greater attention began to be paid to the conservation sciences, and this trend was reflected in reintroduction work. In the United States, the publishing of Rachel Carson's *Silent Spring* in 1962 brought concerns about the natural environment to the forefront of the American consciousness; this continued through the ratification of the 1973 U.S. Endangered Species Act.

At the same time, release of large, charismatic vertebrates began taking place around the globe, and the subsequent media and scientific attention captured further public interest (Seddon et al. 2007). Some notable reintroductions are: the 1979 reintroduction of brush-tailed bettong (*Bettongia penicillata*) to Australia (Delroy et al. 1986); the 1983 reintroduction of swift fox (*Vulpes velox*) to Canada (Smeeton and Weagle 2000); the 1984 reintroduction of golden lion tamarins (*Leontopithecus rosalia*) to Brazil (Kleiman 1989); the 1982 and 1988 reintroductions of Arabian oryx (*Oryx leucoryx*) to Oman (Stanley Price 1986, 1989), and the high-profile 1987 capture of all



remaining wild California condors with the intent of reintroducing them in later years (California Condor Conservation 2008).

### **Reintroduction in the Era of Conservation: Establishment and Legitimacy (1988 – 2009)**

The high visibility and popularity of these reintroductions led to a burst in popularity, prompting new projects to be hastily undertaken, sometimes without due consideration of the needs of the environment or focal species. After a series of ill-fated releases throughout the 1980's, the IUCN formed the Reintroduction Specialist Group (RSG) as a special group within the Species Survival Commission (SSC) (Stanley Price and Soorae 2003, Armstrong and Seddon 2008). The establishment of the RSG further solidified reintroduction biology as a science, and provided a centralized forum for reintroduction practitioners. In 1998, the RSG put forth the first draft of the IUCN Reintroduction Guidelines, a set of statutes that outlined the considerations, studies, and provisions recommended for a successful and responsible reintroduction. The establishment of these Guidelines, which have undergone several revisions since their introduction, marked an important step forward in the pursuit of internal consistency for reintroduction biologists. Reintroduction biologists and practitioners took another important step forward in 2008, with the coordination of the 1<sup>st</sup> International Wildlife Reintroduction Conference, hosted at the Lincoln Park Zoo in Chicago, Illinois, USA.

### **CURRENT ISSUES AND CHALLENGES IN REINTRODUCTION**

As reintroduction biology moves forward, it faces both the opportunities and challenges of any maturing science, as well as taking on the ongoing issues of

conservation biology. As a nascent science, reintroduction biology behaves as any entrepreneurial industry would, seeking efficacy and legitimacy as it seeks to establish itself on the scientific landscape. Unfortunately, the field has encountered significant challenges to both its efficacy as a practice and its legitimacy as a science.

### **Efficacy and Legitimacy of Reintroduction Biology**

The efficacy of reintroduction biology has been questioned repeatedly, in part because of its historically low success rate (a problem that has not improved over time) (Clark and Westrum 1989; Snyder et al. 1996; Fischer and Lindemeyer 2000). This poor performance and apparent taxonomic biases has raised concerns about whether reintroductions have value as conservation tools. Some have suggested, somewhat disparagingly, that the primary value of the reintroduction lies in its ability to attract attention (Lipsev and Child 2007).

The scientific legitimacy of reintroduction biology has also been challenged, due to the dearth of replicable experimental designs in the reintroduction literature. This paucity, however, must be considered in the context of the unique history and needs of reintroduction biology. Historic reintroductions have been primarily opportunistic or *ad hoc*; because of this, little precedent exists for experimental design in the field. Seddon et al. (2007:307) described the maturation of the experimental/deductive process within the field as being “in its infancy,” pointing out that the field remains largely in a state of inductive inference, not yet prepared to deductively test and disprove hypotheses about how reintroductions might best be practiced. Some have suggested that experimental design in reintroductions could take advantage of the extant reintroduction structure,

deriving deductively tested hypotheses from manipulative management of releases, modeling of reintroduced populations, monitoring studies, captive breeding studies, and pre-release behavioral experimentation (Sarrazin and Barbault 1996, Seddon et al. 2007).

However, reintroduction projects face unique logistic challenges that may make replicable experimental designs difficult to create and execute. Reintroductions are often high-profile, media-friendly events that engage public interest, particularly through the use of charismatic animals in romantic settings (Morris 1986; Kleiman 1989; Lipsey and Child 2007; Seddon et al. 2007). Because of this, they often become lucrative events for government or NGO officials, offering the opportunity to show authorities taking concrete action towards improving the state of the environment (Seddon et al. 2007). It may be difficult, therefore, to persuade officials of the need for experimental design, particularly when a modified design might in any way interfere with the public relations benefits of the current methods.

### **Rigor and Evaluation in Conservation Biology**

Reintroduction biology also carries over an inherited problem from its parent science, conservation biology. Conservation biology lacks the regular and rigorous evaluation procedures of many other disciplines, leading to a lack of certainty about the efficacy of conservation practices and work (Kleiman et al. 1999; Ferrarro and Pattanayak 2006; Nichols and Williams 2006; Pullin and Stewart 2006). Because reintroduction biology is a relatively young discipline within this broader field, it is even farther from developing to the point of internal evaluation and consistency sought by conservation biologists. The IUCN Guidelines for Reintroduction (1998) were published

with the intent to remedy this problem by providing a checklist for evaluating pre- and post-reintroduction processes. However, the provision of these guidelines does not necessitate their implementation, and lack of evaluation continues to be a challenge for the field.

## **CHAPTER II**

### **CASE STUDY OF THE SEA EAGLE RECOVERY PROJECT**

#### **INTRODUCTION**

The reintroduction of an extirpated species can be a complex, expensive, and time-consuming operation (Kleiman 1989; Lipsey and Child 2007; Seddon et al. 2007). Because of the legal, ecological, and sociopolitical complexities involved in a reintroduction program, practitioners must be capable biologists and planners, as well as adept educators and human relations specialists (Sarrazin and Barbault 1996). Evaluations of reintroduction programs are rare, but are generally retrospective, relegated to the sponsoring organization or entities, and produced in the form of reports or status updates on the progress of the species (Seddon et al. 2007). Because these reports are intended to address focal points of the reintroduction in a clear and concise manner, they rarely delve deeply into the complexities of reintroduction management, protocol, or organization.

#### **OBJECTIVE**

The goal of this chapter is to provide a better understanding of the process of wildlife reintroduction through a case study of reintroduction leadership and management. The use of a case study approach allows for in-depth exploration of a single topic, and allows the researcher to ask questions directly of participants and practitioners and examine the literature available relative to the project. This ultimately results in a synthetic review of documentation, personal communication, observation and participation, all of which can be used to contextualize the experience (Miles and

Huberman 1994; Stake 1995; Yin 2003; Creswell 2007). To that end, I undertook this case study of the Sea Eagle Recovery Project (SERP) in Scotland. I conducted interviews with practitioners, took notes as an observer-practitioner, and conducted a review of archival documentation (i.e., newspaper articles, opinion pieces, children's books, journal articles, etc.) related to the project.

## **BACKGROUND**

### **The White-tailed Sea Eagle**

The white-tailed sea eagle (*Haliaeetus albicilla*; *Gaelic: Iolair mhara*), in the family *Accipitridae*, is the largest bird of prey in the United Kingdom. It possesses a wingspan over 2 m, and an average male/female weight of 4.5/6 kg, with females significantly larger than males (Love 1983; Royal Society for the Protection of Birds 2006). Adults of the species are brown with pale heads and white, wedge-shaped tails, yellow beaks, yellow un-feathered legs, and golden eyes (Love 1983; RSPB 2006). The average lifespan is 15-20 years in the wild, and sexual maturity is reached at approximately 5 years of age. Extended juvenilia has been observed in some captive-raised eaglets (R. Dennis, Sea Eagle Project Team, personal communication). White-tailed sea eagles (WTSE) are monogamous, territorial breeders; nest building occurs in high trees or on rocky ledges, and eyries may be reused throughout the lifetime of the bird (Love 1983; Green et al. 1996; Bainbridge et al. 2002; RSPB 2006).

*Diet and Range.*—The diet of the white-tailed sea eagle consists primarily of fish and small mammals, with occasional predation of small birds and scavenging of carrion. The predation of lambs has led to major conflicts with crofters in some areas of the sea

eagle's range, and may have been a factor originally contributing to their persecution (Love 1983; RSPB 2005). The WTSE's range extends over most of northern Europe and Asia, with roaming birds observed as far south as the Mediterranean (RSPB 2006).

*Extinction of the Eagle.*—The sea eagle is native to Scotland, and has been a significant figure in both the written historical and archaeological record of the region, appearing in literature as early as the 7<sup>th</sup> century, and in carvings on Pictish relics predating the Bronze Age (Love 1983, 2006; Scottish Natural Heritage 1996; RSPB 2006). Agricultural expansion and urban growth in the 18<sup>th</sup> and 19<sup>th</sup> centuries led to the widespread persecution of carnivores and birds of prey (Love 1983; SNH 1996). The sea eagle population began to decline in the 19<sup>th</sup> century, and was extirpated completely by the early 20<sup>th</sup> century. The last wild pair appeared on the Isle of Skye in 1916, and the last wild individual was shot in Shetland in 1918 (Love 1983; Bainbridge et al. 2002; Mudge et al. 1996).

## **THE SEA EAGLE RECOVERY PROJECT**

The Sea Eagle Recovery Project (SERP) is a nationwide effort to reintroduce the white-tailed sea eagle (*H. albicilla*) to its former range throughout the United Kingdom. The SERP was begun in 1968, and its four phases (Table 1) have taken place in Scotland, as that was the last stronghold of the species until their extirpation in the early 20<sup>th</sup> century (Love 1983). Norway, the United Kingdom's nearest northern European neighbor, maintains a viable population of sea eagles that has acted as the donor population throughout the duration of the Scottish project (Green et al. 1996, Mudge et al. 1996).

Table 1. Summary of White-tailed Sea Eagle Reintroduction Phases.

Phase/Location	Year	No. of Birds Released	Final Status
Pilot Phase: (Fair Isle)	1968	4 (2 male, 2 female)	Unsuccessful*
Phase 1: the Hebrides (Isle of Rum)	1975–1985	82 (39 male, 43 female)	Successful*
Phase 2: Western Scotland (Wester Ross)	1993–1998	58	Successful*
Phase 3: Eastern Scotland (Fife)	2007– present	29	Ongoing (Successful)*

\*These measures were self-reported.

### **The Sea Eagle Project Team**

The Sea Eagle Project Team (SEPT) is a collaborative group of scientists, managers, and practitioners who guide and manage the Sea Eagle Recovery Project. Many SEPT members represent partner organizations in the process, although some are experts on the species, or in the field of raptor ecology, who volunteer their advice to the panel. The SEPT steers the Sea Eagle Recovery Project, while working under the



auspices of whichever government and non-government organizations are sponsoring that particular phase of the reintroduction (Mudge et al. 1996; Love 2006).

### **Pilot Phase: Fair Isle (1968)**

The first effort to reintroduce the sea eagle was undertaken, on a small scale, in Argyll in 1959. A more comprehensive test reintroduction was undertaken on Fair Isle in 1968, and involved the release of 4 Norwegian birds; of these birds, one died and 3 dispersed (Love 1983). The latter reintroduction did not establish a breeding population on Fair Isle, but it did become an important pioneering step in establishing the viability of the reintroduction on a larger scale (Joint Nature Conservancy Council 1988; RSPB 2006).

*Structure.*—Because the pilot phase was largely exploratory, it did not require much staff or organizational structure for its execution. Less than 5 individuals (including 2 non-participant observers) were present for the original Fair Isle release. The release took place at the Fair Isle Bird Observatory, a popular bird-watching destination in the north of Scotland.

### **Phase I: Isle of Rum (1975–1983)**

The first official reintroduction of the sea eagle took place on the Isle of Rum (then, Rhum), and from 1975–1985, a total of 85 eagles (40 male; 45 female) were imported from Norway. A total of 82 eagles (39 male; 43 female) were ultimately released on the Isle of Rum (JNCC 1988). First nests were built in 1982; first clutches of eggs (3 clutches) were laid in 1983; first hatching (3 clutches hatched) in 1985; first chick fledged in July 1985. By the end of the first phase of the Sea Eagle Recovery

Project in 1985, 80 birds had survived, and 6 young had been bred in the wild, making the reintroduction one of the most successful in the history of the United Kingdom (JNCC 1988).

*Structure.*—The first phase of the reintroduction was sponsored by the Nature Conservancy Council (NCC). At the time, the NCC served as the main supervisory body of the British government in the area of ecology, and the reintroduction was approved and sponsored through their offices (JNCC 1988). This meant that employees were hired on through the NCC, and supervision and evaluation took place under the auspices of NCC staff (Love 1983).

#### **Phase II: Western Scotland (1993–1998)**

A second phase of the sea eagle reintroduction was then begun in 1993 (Scottish Natural Heritage 1995; Love 2006). The five-year scheme was led by Scottish Natural Heritage (SNH) in cooperation with the Royal Society for the Protection of Birds (RSPB), and involved the release of 58 total birds. By 1995, the total number of wild sea eagles bred in Scotland had reached 46 (SNH 1995), however, population growth appeared to be stagnating. Green et al. (1996) reported that the long-term viability of the population seemed dubious, presenting a dire forecast of decline in the population unless further releases took place. By the conclusion of the five-year effort, 18 breeding pairs had established in the wild, raising 9 broods of 13 eaglets total (Love 2006).

From 1998–2003, breeding pair numbers increased and approximately 12 eaglets survived each year. By 2003, 31 pairs had established, and 26 young fledged from 25 clutches. The subsequent year, 2004, yielded 19 young, and 2005 yielded 24 fledglings

(Love 2006). Although breeding was improving, and the western population continued to strengthen, some persecution remained, and by the end of 2004, 25 eagles had been reported dead, 25% of whom had been killed illegally, primarily through poisoning (Love 2006).

*Structure.*—In 1992, the Nature Conservancy Council (NCC), who had overseen the first phase of the reintroduction, was split by region into English Nature, Scottish Natural Heritage (SNH), and the Countryside Council for Wales (CCW), with the Joint Nature Conservation Committee (JNCC) acting as an overseeing statutory body (JNCC 2008). Scottish Natural Heritage then took the helm of the project, which eventually fell under their 1995 Species Action Programme (SAP), which detailed the needs and conservation agendas for threatened and endangered species in Scotland (SNH 1995).

By the second phase of the reintroduction, the Royal Society for the Protection of Birds (RSPB), who had previously opposed the reintroduction, lent their support to the project by helping to monitor the growing population of released eagles. However, although the RSPB provided staff and materials to gather and analyze monitoring data, fieldwork was still managed by employees of SNH.

### **Phase III: Eastern Scotland (2007–2012)**

The third phase of reintroduction began in August of 2007 and marked the launch of a five-year scheme to further the mission of reintroduction by expanding the sea eagle population throughout its historic range (BBC 2008). Although recolonization was expected to take place naturally, over time, the creation of an eastern Scotland population would strengthen the overall presence of the eagle in Scotland while

hastening its recolonization of the entire region. In keeping with the goal of range expansion, 2007 also marked the launch of the Irish Sea Eagle Project, which released 15 Norwegian chicks into Killarney National Park in County Kerry (RSPB 2007).

*Structure.*—The third phase of the reintroduction has seen a reversal of positions, as well as the addition of new members. The RSPB, who previously handled the monitoring of the reintroduced population, are now the authority on matters of fieldwork; SNH has since taken a less active role in the physical management of the birds. Forestry Commission Scotland, the government body responsible for the maintenance and management of forested areas of Scotland, has also become a partner on the Sea Eagle Recovery Project.

## **METHODS**

The case study method offered a unique opportunity to undertake an in-depth exploration of a phenomenon (Miles and Huberman 1994; Stake 1995; Yin 2003; Creswell 2007), and was therefore chosen for this project. As exploratory research, I felt the topic could be best addressed by gathering data from a variety of sources (e.g., participant-observer field notes, interviews, document and audiovisual analysis, and literature review) and synthesizing information into a comprehensive analysis.

### **Study Site**

My research focused on the Sea Eagle Recovery Project (SERP), a nationwide effort to reintroduce the white-tailed sea eagle to its former range throughout the United Kingdom. As such, the sites of study were relative to the locations of the releases, as well as to the headquarters of the sponsoring organizations and the current postings of

the Project practitioners. Interviews took place in Stirling, Inverness, Dunphail, Tobermory, Fort William, Broadford, and Edinburgh, Scotland.

*Site Selection.*— The SERP was selected for this study because of its celebrated and high-profile success (RSPB 2006, BBC 2005, SNH 1995). Additionally, it was selected because its sociopolitical context was similar to that of the United States, hopefully mitigating some of the difficulties of cross-cultural research. Both the UK and the USA function on generally capitalist, value-oriented economies (CIA 2009a, b).

### **Interviews: Collection and Analysis**

*Interview Protocol.*—I conducted a total of 17 face-to-face, in-depth, semi-structured (also: "focused", Yin 2003) interviews, of an average duration of 45 minutes each. Follow-up interviews were conducted via Skype telephone service with 2 of the original interviewees. Questions pertained to the individual interviewee's experience with sea eagles during, prior to, and after the reintroduction project, as well as the organizational structure of the project during the individual's time of employment, and the overall experience of working with the project (Appendix A). I made general use of a modified logic model framework, based in the Gugiu and Rodriguez-Campos semi-structured interview protocol (2007), to guide the interview process. This method consisted of a series of introductory questions to gain basic information about the interviewee, followed by a series of open-ended questions intended to engage the interviewee in dialogue about their experiences. No time limit was provided for the duration of interviews, and so some variability in length does appear.

My interviews took place in several different locations around Scotland; I generally allowed decisions about where to meet to be made by the interviewee, and sites were usually determined by their personal comfort with the region and ease of access. Interviews were face to face, except in cases of logistic infeasibility, whereafter interviews were conducted by Skype telephone. The choice of telephone or face-to-face interview is not believed to have a significant impact on data (Marcus and Crane 1986; Sturges and Hanrahan 2004).

*Interviewee Selection.*—I collated a list of potential interviewees prior to departing for my study site; this list was amended constantly throughout the data collection process. I gathered new names of potential interviewees using a snowball sampling method, whereby initial contacted interviewees identified others within the same group, with perspectives either similar to or different from theirs, who might also be willing to participate in the project. This method is frequently used in social science research, as it can allow for targeted access to specific population subgroups (Goodman 1961).

During the interviewee selection process, I imposed further selection criteria requiring all interviewees to have been dedicated, paid, full-time employees on the reintroduction project for at least 3 months. These selection criteria support a purposive sampling approach, intended to provide illustrative detail about a process, rather than increase generalizability of results (Erlandson 1993; Lincoln and Guba 1985).

*Interview Transcription.*—I transferred all digital audio files of interviews onto a secure laptop and converted them into mp3 files. I then transcribed interviews, either

personally or through the use of a professional transcription service, into text documents using Apple iTunes software, activated with keystroke stop/start cues. All interviews were transcribed confidentially; interviewees were assigned numbers and no identifying information was recorded. These methods, filed under protocol number 2008-0131, were determined to be exempt from review by the Texas A&M Office of Research Compliance's Institutional Review Board, under federal code 45 CFR 46.101(b)(2).

*Interview Analysis.*—I printed and read all transcribed interviews. The reading of the transcripts offered an opportunity to notice and mark (“tag”) recurrent concepts. Passages of the interview transcription which indicated a singular thought, idea, or concept were tagged; passages that were not relevant to the Sea Eagle Recovery Project were not. These tagged concepts were then clarified into a data-guided classification system (“typology”) (Caracelli and Greene 1993, Creswell 2007) as 3 experience themes (ETHs) encompassing 8 experience types (ETs) and 44 experience characteristics (ECs) (Table 2). The final typology reflected the types and characteristics (quality, frequency, etc.) of SERP practitioner experiences. This process matches the overall rhetorical structure that has been suggested by Stake (1995) and supported by Creswell (2007) for conducting case study research.

Table 2. Table of Codes/Subcodes Used for Sea Eagle Interview Analysis.

Experience Type (ET)	Experience Characteristic (EC) Codes and Subcodes
Contact with Supervisor (CS-)	Frequent (F) /Infrequent (I)  Positive (+) /Negative (\$)
Position/Job Duties (JD-)	Autonomous (A) /Non-autonomous (Na)  Primary (P) /Secondary (S)  <i>Subcodes: Fieldwork (Fw)/Administrative work (Aw)/ Public Relations work (PRw)/Supervise Others (So)</i>
Relationship with Coworkers (RC-)	Shared Responsibilities (SR)/ Divided Resp. (DR)  Egalitarian (E) /Hierarchical (H)
Goal-Setting and Evaluation Process (GSE-)	Proximate (P) /Ultimate (U)  <i>Subcodes: Formal (L) / Informal (casual)(C); Positive (beneficial) (+) /Negative (costly) (\$)*)*; Frequent (F) /Infrequent (I)</i>
Contact with Public (CP-)	Positive (+) /Negative (\$)*)  Frequent (F) /Infrequent (I)
Public/Media Relations (PR-)	Internally Generated (Y)/Externally Generated (X)  - <i>Positive (+) /Negative (\$)*)</i>  - <i>Frequent (F) /Infrequent (I)</i>
Progress of Program (PP-)	Good (G) /Bad (B)*)
Performance of Program (PO-)	Good (G) /Bad (B)*)

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\*)For these code sets, Neutral (N) was also an option.



**Document/Audiovisual Materials: Collection and Analysis**

*Document Collection.*—In addition to interviews, I gathered documentation such as pamphlets, newsletters, newspaper and internet articles, books, brochures, DVDs, TV programs, flyers and informational packets either presented by or related to the Sea Eagle Recovery Project. I collected these items from archival collections at the Royal Society for the Protection of Birds (RSPB) Scotland headquarters, the Scottish Natural Heritage (SNH) offices, and a variety of wildlife centers located around the country. I gathered further items as donations from the private collections of biologists and practitioners who had worked on the Sea Eagle Recovery Project (Table 3).

*Document Analysis.*—I analyzed documents using the typology developed from the interview analysis phase. The resultant data were then integrated into the 8-variable experience type (ET) framework. This process allowed me not only to contribute more data to the development of the framework, but also offered an opportunity to increase the reliability of data through triangulation.

Table 3. Documents and Audiovisual Material Collected Regarding the SERP.

Data type	Total collected	Notes
Interview	17 interviews, totaling 11 hrs	Collected at homes and offices of biologists who worked with the Sea Eagle Recovery Project
Document - book	3	Documents and audiovisual materials were gathered from archival collections at RSPB-Scotland and Scottish Natural Heritage headquarters, as well as from private collections at the homes of naturalists and wildlife biologists who had been participants in the Sea Eagle Recovery Project.
Document – newsletter	5	
Document – packet	2	
Document – pamphlet	6	
AV material – DVD	1	
P/O Field Notes	15 pg	Gathered with members of the Sea Eagle Project Team, as they completed daily tasks with the eagles (feeding, monitoring, etc.).

## RESULTS

From the interview data, I was able to define 8 experience types (ETs) (Table 4). These ETs were then further distilled into 3 experience themes (ETHs). The identified ETHs are: (1) Autonomy and Hierarchy; (2) Accountability, Goals and Evaluation, and (3) Public Relations/Outreach. After reviewing the data relative to each ETH, there appeared to be particularly interesting implications for ETH 1 (Autonomy and Hierarchy) and ETH 3 (Public Relations/Outreach). Progress and Performance of Program data were used to identify patterns of influence among project variables, and

were collected from interviews and document analysis. Good/Bad/Fair/Neutral were assessed subjectively during analysis, based on the quality attributed by interviewees to each, in response to specific questions asked during the interview.

In ETH 1 (Autonomy and Hierarchy), there appeared to be improvements in the progress and performance of the program associated with 2 particular elements of managerial style. These were (1) an increase in hierarchy and clear division of responsibilities amongst team members, although not necessarily a decrease in autonomy, and (2) an improved relationship with supervisors, although not necessarily an increase in supervisory contact.

In ETH 3 (Public Relations), there appeared to be a relationship between the type and tenor of internally generated press and the quality of the relationship with the public. Several interviewees mentioned the change in internally generated information and press: from positive-only (“Sea Eagles are great!”) to offering both positive and negative information (“Here are some of the benefits and risks of a sea eagle reintroduction.”), and suggested that it may have played a role in public acceptance. This hypothesis was supported by a chronological cross-analysis of program press materials with opinion or citizen-contributed sections in local newspapers.

Table 4. Experience Types (ETs) and Characteristics (ECs) of the SERP.

Experience Types (ETs)	Pilot Phase	Phase I	Phase II	Phase III
Autonomy of Position (ETH 1)	Autonomous	Less Autonomy	Autonomous	Less Autonomy
Contact with Supervisor (ETH 1)	Neutral	Frequent	Infrequent	Frequent
	Negative	Neutral	Positive	Neutral
Relationship with Colleagues (ETH 1)	Divided	Shared	Divided	Divided
	Responsibilities	Responsibilities	Responsibilities	Responsibilities
	Hierarchical	Egalitarian	Neutral	Hierarchical
Proximate Goal-Setting and Evaluation (ETH 2)	Frequent	Frequent	Frequent	Frequent
	Informal	Informal	Both Informal and Formal	Informal
Ultimate Goal-Setting and Evaluation (ETH 2)	Neutral	Infrequent	Infrequent	Infrequent
	Formal	Formal	Formal	Formal
Externally Generated Press/PR (ETH 3)	Frequent	Frequent	Frequent	Neutral
	Positive	Positive	Both Positive and Negative	Positive
Internally Generated Press/PR (EHT 3)	Not Applicable	Frequent	Infrequent	Frequent
	Not Applicable	Positive	Positive	Both Positive and Negative
Contact with Public (ETH 3)	Neutral	Neutral	Frequent	Frequent
	Not Applicable	Negative	Both Positive and Negative	Both Positive and Negative
Progress of the Program	Good	Poor	Fair	Good
Performance of the Program	Poor	Good	Good	Good

## DISCUSSION

### Autonomy and Hierarchy: ETH 1

Autonomy refers to the ability of team members to function independently, either while in the office or in the field. Hierarchy refers to the assignation of responsibilities and privileges to team members according to a graded or ranked system. Elements of this ETH included: (a) Autonomy of position, referring to the apparent ability of each reintroduction team member to independently make decisions and take action to further the goals of the reintroduction; (b) Contact with Supervisor, referring to both the frequency and quality of interactions with both immediate and indirect supervisors; and (c) Relationship to Colleagues, measured along an egalitarian/hierarchical scale, as well as along a shared responsibilities/divided responsibilities scale.

Table 5. Results of Autonomy and Hierarchy (Experience Theme 1) in the SERP.

Experience Types (ETs)	Pilot Phase	Phase I	Phase II	Phase III
Autonomy of Position (ETH 1)	Autonomous	Less Autonomy	Autonomous	Less Autonomy
Contact with Supervisor (ETH 1)	Neutral	Frequent	Infrequent	Frequent
	Negative	Neutral	Positive	Neutral
Relationship with Colleagues (ETH 1)	Divided	Shared	Divided	Divided
	Responsibilities	Responsibilities	Responsibilities	Responsibilities
	Hierarchical	Egalitarian	Neutral	Hierarchical

Autonomy appeared to fluctuate throughout the various phases of the SERP (Table 5), with little apparent effect on performance. This supports the findings of Farh and Scott (1983), who found that in an experimental setting, variation in autonomy had a negligible effect on performance. However, Dodd and Ganster (1996) challenged those findings, suggesting that perhaps autonomy only affects performance relative to the type of task being performed. They distinguish between high-variety and low-variety task assignments, and found that in high-variety tasks, increased autonomy improved performance by 16%, while the effect on low-variety tasks was negligible. Langfred (2000) found similar results, stating that high autonomy improved performance when task interdependences (i.e. shared responsibilities) of a group were also high.

This may have relevance for the perceived lack of macroscopic relationship between autonomy and performance in SERP. That is; within a single phase of a reintroduction, autonomy might have affected performance only if the type of tasks being performed by practitioners were of sufficiently high variety or high interdependence. High-variety and high-interdependence assignments would be expected in phases of the reintroduction that were less hierarchical and involved more shared responsibilities. In such scenarios, employees would be expected to pitch in on all aspects of the reintroduction, and increasing autonomy may have improved performance.

Unfortunately, such a combination of factors did not appear during the four SERP phases. Although the opposite effect could be perceived in Phase 3 (which was more hierarchical, had divided responsibilities, reduced autonomy, and was ultimately very successful) cannot be taken as evidence that the alternate correlation would exist.

## Accountability, Goals and Evaluation: ETH 2

Accountability refers to the ability or expectation of practitioners to explain or justify their actions through formal or informal evaluation or review. It is reflected in the determination of goals, followed by the evaluation of the completion of those goals. Evaluation refers to the complete process of professional assessment, which may be undertaken by either internal or external agents of the program. This ETH included: (a) Proximate goal-setting and evaluation, referring to the establishment of immediate/short-term formal or informal goals, and the evaluation or assessment of whether or not those goals had been met; and (b) Ultimate goal-setting and evaluation, referring to the establishment of ultimate/long-term formal or informal goals, and the evaluation or assessment of whether or not those goals had been met

Table 6. Results of Accountability, Goals and Evaluation (Experience Theme 2) in the SERP.

Experience Types (ETs)	Pilot Phase	Phase I	Phase II	Phase III
Proximate Goal-Setting and Evaluation (ETH 2)				
	Frequent	Frequent	Frequent	Frequent
	Informal	Informal	Both Informal and Formal	Informal
Ultimate Goal-Setting and Evaluation (ETH 2)				
	Neutral	Infrequent	Infrequent	Infrequent
	Formal	Formal	Formal	Formal

The amount of accountability in an organization may be reflected in its performance rating and evaluation process. Theoretically, the implementation of performance ratings increases accountability by holding participants responsible for actions taken and results produced. In reality, this may not always be the case, as performance ratings and evaluations may be inefficient, inappropriate, or counterproductive to improving performance (Halachmi 2002, De Lancer Julnes 2006, Tilbury 2006).

SERP findings neither supported nor negated this notion. Throughout all phases, ultimate goals were formally set and evaluated infrequently, while proximate goals were informally set and evaluated frequently (Table 6). There was so little inter-phase variation in this category, in fact, that it would be difficult to detect even the slightest indication of an effect on performance, which varied, throughout the duration of the SERP.

### **Public Relations/Outreach: ETH 3**

Public Relations/Outreach refers to the effort made by the reintroduction to interact with, access, educate, or include members of the public during the reintroduction process. Elements of this ETH included: (a) Internally Generated Press/Public Relations, referring to any press or public relations efforts that were initiated and controlled by the program itself and measured in terms of frequency and quality; (b) Externally Generated Press/Public Relations, referring to any press or public relations efforts that the program chose to participate in, but were not directly controlled or initiated by the program itself



and measured in terms of frequency and quality; (c) Contact with Public, measured in terms of frequency and quality.

It can be difficult to parse the contribution of public relations to the ultimate performance of an organization or project, largely because the intangible benefits of improved relationships, improved legitimacy, or improved public opinion can be difficult or cumbersome to measure (Bennett and Gabriel 2001, Likely 2003, Phillips 2006). But because reintroduction programs can be closely interrelated with issues of public sentiment (Clark and Westrum 1989, Kleiman 1989, Seddon et al. 2007), the relationship between public relations and program performance can have particular salience to this field.

Despite the difficulty in determining exact measurement patterns for connecting public relations to performance, it can be generally logically assumed that high-quality PR efforts will have a positive effect on public sentiment, and ultimately, performance, whereas low-quality PR efforts will have a negligible or detrimental effect. The question, then, should focus on devising measurements of quality for PR efforts.

In the case of the SERP, I believe it would be best to rate PR quality by three characteristics: (1) adherence to scientific fact, (2) inclusivity of presentation (i.e. not overly technical, expensive, or esoteric), and (3) appeal of PR product. Working with these criteria, we can make better sense of the SERP findings.

Table 7. Results of Public Relations (Experience Theme 3) in the SERP.

Experience Types (ETs)	Pilot Phase	Phase I	Phase II	Phase III
Externally Generated Press/PR (ETH 3)	Frequent Positive	Frequent Positive	Frequent Both Positive and Negative	Neutral Positive
Internally Generated Press/PR (EHT 3)	Not Applicable Not Applicable	Frequent Positive	Infrequent Positive	Frequent Both Positive and Negative
Contact with Public (ETH 3)	Neutral Not Applicable	Neutral Negative	Frequent Both Positive and Negative	Frequent Both Positive and Negative

In Phase 1, both internal and external PR efforts were frequent, and highly positive (Table 7). Early publications regarding sea eagles focused heavily on the merits of the SERP, frequently using either quixotic petition (e.g. “the triumphant return of the Scottish sea eagle”) or an intellectual plea to aestheticism (e.g. “the majestic eagle soaring above the river”). The avoidance of controversial issues in these early PR efforts (keeping mum on the topic of lamb predation, in particular) meant that this phase avoided direct address of factual problems. Inclusivity was also reduced, as the sea eagles were introduced to secret locations on an island nature preserve in the Outer Hebrides, making active participation in the SERP inaccessible to most citizens, and

simultaneously reducing the appeal of the project. Public reaction to the SERP during this phase was generally negative, and a record of an almost 25% persecution rate of sea eagles was recorded in Phase 1 (JNCC 1988).

Phase 2 improved upon the PR efforts of Phase 1 by expressing greater adherence to scientific fact and improving inclusivity. Phase 2 PR addressed the issue of lamb predation head-on through the creation of a “support program” for predated crofters, and began to openly address the challenges of the SERP in print. Phase 2 also saw the opening of the sea eagle viewing site, the formation of community partnerships to protect sea eagle nests, and the widespread distribution of brochures and pamphlets which offered simple, unbiased information about the SERP. Public opinion of the SERP improved during this time, with some communities becoming very active supporters of the program (Table 7).

Phase 3 saw a dramatic change in PR efforts, with a specially increased focus on inclusivity. Publications vary from children’s books to highly technical annual reports, and particular attention has been paid to linguistic parity, with brochures and pamphlets now listing the Gaelic names of the eagle alongside its English one. There also seems to be a heavy focus on appeal, with a profusion of positive and aesthetic pamphlets, articles, brochures, and promotional items advertising the aesthetics and romantic ideals of the sea eagle.

Generally, the Public Relations of the SERP appear to have improved in some areas over time, but may lag in others. Undoubtedly, the quality of public relations

affects popular opinion of the SERP, but the exact ways in which these two things relate would require a more deeply focused probe than this case study offers.

## **CONCLUSIONS**

The interview method allowed for the acquisition of stories, statements, histories, and details of experience that were very useful for an exploratory case study. The interviews provided a range of information that could then be synthesized into patterns, the first step towards creating predictive hypotheses.

### **Future Directions**

Now that a preliminary outline of experience characteristics and themes has been established, it might be beneficial to the body of research for a second, more directed case study to take place. If undertaken as part of a comparative case series, this could probe more deeply into the particularities of experience within the SERP, and would allow for contextualization of that experience relative to other reintroductions. Another option, the one that I have pursued in the third chapter of this thesis, would be to use the identified experience themes, types, and characteristics (Table 2) to produce a survey instrument that could offer the opportunity to analyze a wider range of projects, although with less depth than the case study approach might. Another area of research that might be fruitful is the study of cross-cultural value orientations within the reintroduction. Although the initial phases of the reintroduction took place only in Scotland, more recent developments have seen the launch of a reintroduction in Ireland, and the proposal of reintroductions to England and Wales. These future reintroductions might offer rich opportunities for study and further understanding of the reintroduction experience.

**CHAPTER III**  
**SURVEY ON LEADERSHIP AND MANAGEMENT OF WILDLIFE**  
**REINTRODUCTION PROGRAMS**

**INTRODUCTION**

Many factors can influence the success of a reintroduction program, due in part to the complexity of habitat systems within which species might be reintroduced (Steury and Murray 2004). Some factors which have shown to be influential are: changes in climate (McCarty 2001), competition with extant populations (Lomolino and Channell 1995), the presence of predators and parasites (Lomolino and Channell 1995), prevalence or transference of disease (Cunningham 1996), quality of available habitat (Wolf et al. 1996), size of release range (Wolf et al. 1998), proximity of release site to central areas of historic range (Lomolino and Channell 1995), size and density of reintroduced population (Wauters et al. 1997; Wolf et al. 1998; Armstrong et al. 2002; Steury and Murray 2004), and presence of anthropogenic stressors (Steury and Murray 2004; Teixeira et al. 2007).

It is clear that the biological challenges to reintroduction are significant. However, consideration must also be given to the human dimensions of reintroduction work, which can also play a consequential role in determining the ultimate success of a program. Reintroduction programs are complex initiatives, generally requiring long-term financial and political support (Kleiman et al. 1994; IUCN 1998), and demanding the use of both interpersonal and biological skills from its practitioners (Dietz and Nagagata 1986; Clark and Westrum 1989; Sarrazin and Barbault 1996); for this reason,

reintroduction programs necessitate a particular focus on the human element that other conservation initiatives do not require. Furthermore, reintroduction projects require even more communication and human interaction than most conservation programs because unlike a study of an existing, increasing, migrating, or diminishing wildlife population, a reintroduction project produces an immediate, human-led initiation of major change to an ecological community. When that ecological community coexists with a human community, then the project also necessitates a change to that human lifestyle as well. In addition to this, reintroductions tend to be high-profile projects, often including elements of public education/outreach, and attracting attention from various media outlets. In heaping addition to this, reintroduction biologists *only* perform their work reactively – there is never a need to reintroduce something that has not been extirpated in the first place. However, this reactivity may take place whether an extirpation has been as recent as last year or as distant as three centuries ago. In either case, unique challenges for the human community will arise with the reintroduction of an extirpated species to their ecological strata.

Because of these factors, reintroduction biologists tend to work even more closely with the human dimensions of conservation than other sub-disciplines might, necessitating at least some familiarity with aspects of conservation work outside of the simple scientific sphere. Some reintroductions may take it upon themselves to offer public education and involvement events; others, particularly those taking place within a zoo, aquarium, or pre-existing wildlife park, may be able to use this preexisting infrastructure to create a dialogue with the surrounding community. Programs supported

by environmental campaigns may use the campaign itself as a mechanism for information dissemination, through which knowledge sharing and community dialogue can occur (Smith et al. 2007).

Outside of public relations, education and outreach, another critical human dimension to be considered is the reintroduction team itself. As Clark and Westrum (1989) point out, the unique challenges of a reintroduction program require practitioners to have the ability to double as program managers or operate in a leadership capacity for the duration of the project. Clark and Westrum also note that reintroductions are high-stress, highly interactive situations requiring vast amounts of teamwork, public response, and human coordination. The ability to operate effectively in such an environment is not a universal trait – reintroduction planners must carefully consider the personalities and abilities of each team member to interact with their coworkers, other entities, and the public. Jacobson and McDuff (1998), however, bemoan the lack of human dimensions aptitude in conservation biology, accusing the discipline of rearing “idiot savants” – researchers who are highly capable biologists, but inept social actors. Sarrazin and Barbault (1996) note that reintroduction biology, in particular, suffers from inexperience in building strong relationships between communities, managers, and scientists. This is a dangerous weakness for reintroductions to have, because lack of communication about conservation initiatives can lead to antagonism within local communities that can seriously hinder or halt reintroduction efforts, as well as sour relationships for future work (Reading and Kellert 1993). Particularly for conservation biologists, who act as practitioners of a crisis discipline and are frequently tasked with finding immediate,

accessible responses to threats to biodiversity (Soulé 1985; Beissinger 1990; Fleishman et al. 1999), a hostile community could mean an inaccessible ecosystem. In the case of a biodiversity emergency, an inability to relate to communities could mean an inability to perform critical conservation work.

A better approach to the rearing of new conservation and reintroduction biologists might be a more interdisciplinary approach to programming, as some scientists have suggested (Sarrazin and Barbault 1996; Jacobson and McDuff 1998; Smith et al. 2003; Marshall et al. 2007). The use of resources drawn from anthropology, sociology, psychology, business, economics, finance, education and political science (among others) would offer biologists and practitioners a vast volume of interdisciplinary experience from which they could draw innovative solutions. However, this request for more scientific ecumenism is a call to action that has not yet been answered. In fact, Seddon et al.'s (2007) literature review, which categorized 454 papers from 101 journals related to reintroduction, found that the least-common topic of published articles (<5%) was the use of interdisciplinary theories or practices in reintroduction biology.

## **OBJECTIVE**

In viewing reintroduction biology through an interdisciplinary lens, certain problem areas seem to arise: the relative rarity or frequency of rigorous program evaluations (Kleiman et al. 1999; Ostermann et al. 2001; Stern et al. 2005) which can lead to inconsistencies in performance and a lack of accountability for failure; difficulty encountered in the goal-setting process and in defining uniform reintroduction success



criteria (Kleiman 1989; Fleishman et al. 1999), which can contribute to the first problem; architectural constraints such as the existence of the long-term financial and political support generally required by reintroductions (IUCN 1998); and difficulty encountered in the design of efficient, relevant, and appropriate organizational structures (Clark and Westrum 1989). These problems are not novel – they are dealt with every day in the literature of management and organizational structure. Therefore, the goal of this chapter will be (a) to describe the use of a survey instrument to gain insight into the general trends of organizational behavior in reintroduction programs, then (b) to characterize those trends in the face of predictions about organizational behavior and process.

## **BACKGROUND**

### **Organizational Structure**

Conservation initiatives are frequently organized along two major lines of development: large, integrated conservation-development projects (ICDPs), and smaller-scale, community-based projects (CBPs) (Brandon and Wells 1992). While ICDPs sometimes struggle with overwhelming obstacles as they present new conservation initiatives, smaller-scale, community-based projects can experience both long- and short-term success in their work (Brandon and Wells 1992). This disparity may exist because ICDPs, in contrast to CBPs, tend to function on a larger spatial and economic scale (Horwich and Lyon 2007), tend to be short term and have more external funding (Smith et al. 2003), tend to be less flexible in implementation, and generally are not able to provide a mutable, reactive model for conservation within a specific sociopolitical context (Brandon and Wells 1992; Horwich and Lyon 2007).

These organizational issues may influence the performance of a reintroduction project by changing its procedural system; evidence for this can be found in the economics literature. Research there has drawn clear links between organizational structure and performance, suggesting that the effects manifest through the organizational process. Structure can, for instance, influence the efficiency of knowledge transfer (Jensen and Meckling 1990). In reintroduction programs, deficiencies in the speed and clarity with which information is exchanged could be disastrous for practitioners, who often must act quickly when problems arise in the field. Organizational structure has additionally been linked to the overall productivity of program employees (Dalton et al. 1980), a critical factor in both science and business. Structure can also change the value of innovation within an institution (Russell and Russell 1992); in a reintroduction program, this could mean that new ideas or changes could be introduced, accepted, and integrated more slowly. Lastly, organizational structure can influence the credibility of the marketing (John and Martin 1984) – an organization bogged down by unnecessary bureaucracy, for example, might have more difficulty delivering on promised items, events, or effects. This could specifically be a problem for reintroduction programs, which can often be high profile, and whose outcome can be affected by the quality of relationship the program maintains with the public. Sarrazin and Barbault (1996) note that reintroduction biology, in particular, suffers from inexperience in building strong relationships between communities and practitioners, and that this can be detrimental to the science. Reading and Kellert (1993) found that poor information-sharing and relationship-building between conservation

initiatives and communities led to local antagonism that could seriously hinder or halt reintroduction efforts, as well as sour relationships for future work.

## **METHODS**

I designed and conducted a survey using the 5-point Likert scale format (Likert 1932). The survey was divided into 6 sections and consisted of 47 closed-ended questions, requiring approximately 20 minutes for completion. The survey asked questions regarding the experiences of respondents while working for a wildlife reintroduction project. Two invitations were sent to participate in the survey: (1) upon its opening; (2) at the two-week interval/two weeks prior to closing. These methods, filed under protocol number 2008-0131, were also determined to be exempt from review by the Texas A&M Office of Research Compliance's Institutional Review Board, under federal code 45 CFR 46.101(b)(2).

### **Participant Selection**

In order to target the distribution of the survey to my intended audience, I compiled a list of wildlife reintroductions and their practitioners, based on literature reviews and a thorough review of the IUCN-published Reintroduction News online newsletter. From these two sources, I collected the emails of any practitioners listed as contactable authors or practitioners, either on published literature or in the public Reintroduction News Directory of Practitioners. This purposive sampling was undertaken to improve the quality of data collection and likelihood of response; more recent projects are less likely to have staff who have since retired or deceased.

Otherwise, I showed no bias in participant selection relating to species, size or length of project, or budget.

### **Data Collection**

I distributed 401 invitations via email to the selected reintroduction practitioners, selected from the reintroduction literature according to the criteria listed above. The invitation asked participants to complete a brief online survey, consisting of 47 questions divided into 6 sections. These 6 sections represent the 4 themes compiled from the case study of the Sea Eagle Recovery Project (SERP, Chapter II). The 6 sections were: (i) About Your Project, (ii) About You and Your Position, (iii) About Organizational Structure, (iv) About Goal-Setting, Meetings and Evaluation, (v) About Public Relations and Outreach, and (vi) About Success and Performance. A brief review of each of these sections is provided below.

*About Your Project.* —This section asked questions about the general timeline of the reintroduction project (i.e. the length of each planning/action/monitoring phase). These questions were asked for two reasons: (a) they provided a neutral introduction to the survey's style and the types of questions the respondent would be asked, and (b) they could later be used to provide general information about the most common parameters of reintroduction projects in terms of duration.

*About You and Your Position.* —Questions were asked about the respondent's personal experience with the reintroduction project, and reintroduction biology in general. It also asked questions regarding the type and seniority of the respondent's position within their reintroduction project. These questions were asked in order to

further introduce the respondent to the survey, and in order to provide a context of position that could later serve to make a distinction between respondents, offering more targeted information about the perceptions/experiences of a subpopulation (e.g., how do the responses of senior employees differ from junior employees).

*About Organizational Structure.* —The focus in this section related to the size and hierarchical structure of the reintroduction project. These questions were asked in order to provide information that could later contextualize the experiences of the reintroduction project relative to size and hierarchical style.

*About Goal-Setting, Meetings and Evaluation.* —This section asked questions related to the frequency and type of goal-setting and evaluation processes within the reintroduction project. These questions were asked in order to provide information that could contextualize any potential relationship between the goal-setting/evaluation process in the program and ultimate program experience.

*About Public Relations and Outreach.* —This section asked questions about the public outreach and media relations, education, and affiliations created by the reintroduction with other institutions in its field (i.e. other reintroductions) as well as other institutions outside of its field (i.e. 3<sup>rd</sup> party entities: media organizations, schools, etc.). These questions were asked in order to provide information that could later be used to seek any potential relationship between the participation of the reintroduction in cooperative engagements and the ultimate experience of the project.

*About Program Performance and Success.* —Finally, this section asked respondents simple questions about the success/failure and performance of their

programs, both from an internal and an external assessment. These questions, though the simplest, were arguably the most significant, as they provided the opportunity to contextualize all other project parameters in the light of the project's ultimately assessed success/failure.

### **Data Analysis**

Because of the exploratory nature of the survey, I felt it was most appropriate to make use of general trend reporting to describe patterns of the results. This descriptive analysis was undertaken with the Qualtrics website software to generate descriptive statistics relative to the 47 questions (Qualtrics 2009).

## **RESULTS**

Results indicated several trends among reintroduction practitioners (Appendix B). Survey results are presented by section, in the order used to provide questions to respondents.

### **Respondent Demographics**

Respondents were primarily senior employees and founders of wildlife reintroduction programs (Figure 1). Most had 1–3 years of experience at the time they began their reintroduction programs, although a relatively large portion cited over 12 years of experience (Figure 2).

### Reported Positions Held By Reintroduction Survey Respondents

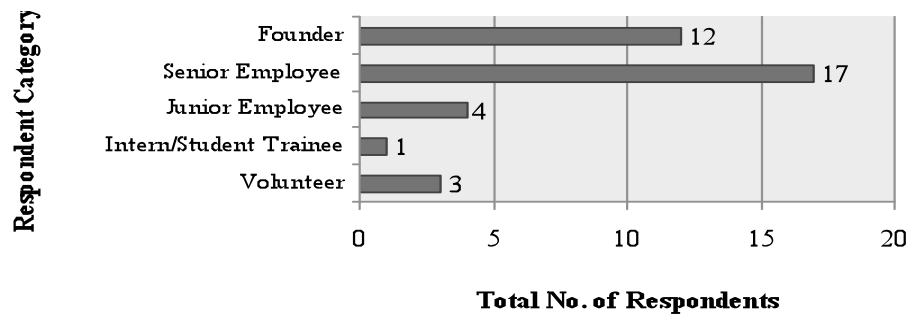


Figure 1. Respondents by Type to Leadership and Management of Wildlife Reintroduction Programs Survey.

### Reported Years of Experience with Reintroductions



Figure 2. Reported Years of Experience with Wildlife Reintroductions among Survey Respondents.

### Reintroduction Phases and Lengths

Questions about phase length divided reintroductions into 4 phases: (1) planning phase, (2) approval phase, (3) action phase, and (4) monitoring phase. “Planning phase” referred to the length of time that it took to conceive and plan the reintroduction project. “Approval phase” referred to the length of time that it took to gain permission from government agencies or leading organizations to reintroduce the focal species. “Action phase” referred to the duration of time that animals were actually captured, captive bred, raised, fledged or hacked, and released into the wild. “Monitoring phase” referred to the length of time that reintroduced animals or populations were monitored post-release.

Results indicated that planning phases most frequently took 1 – 3 years, as did approval phases. Action and Monitoring phases, however, were reported to have commonly taken more than 4 years (Figure 3).

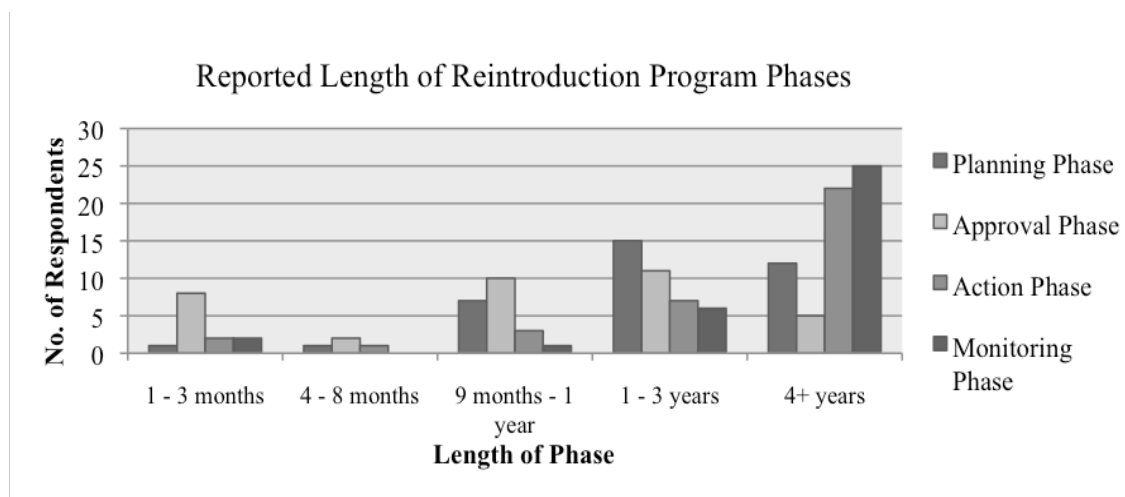


Figure 3. Reported Length of Reintroduction Program Phases.



### Autonomy and Hierarchy

Results indicated that tasks assigned were rarely monitored in reintroduction programs, either directly or indirectly, by supervisors (Figure 4). However, most respondents identified their program only as having been “somewhat autonomous” (Figure 5). Hierarchy reports, on the other hand, appeared to confirm task supervision reports, with most respondents stating that their reintroductions had only been “somewhat hierarchical” (Figure 6). This appears to be confirmed by levels of authority, wherein most respondents reported only one level of authority between the most senior and most junior employees or volunteers in the program (Figure 7).

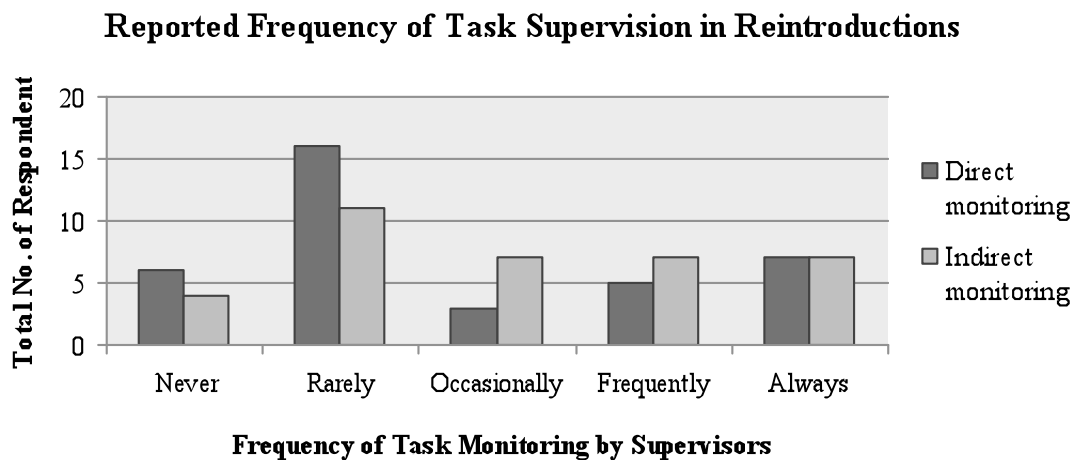


Figure 4. Reported Frequency of Task Supervision in Reintroduction Programs.

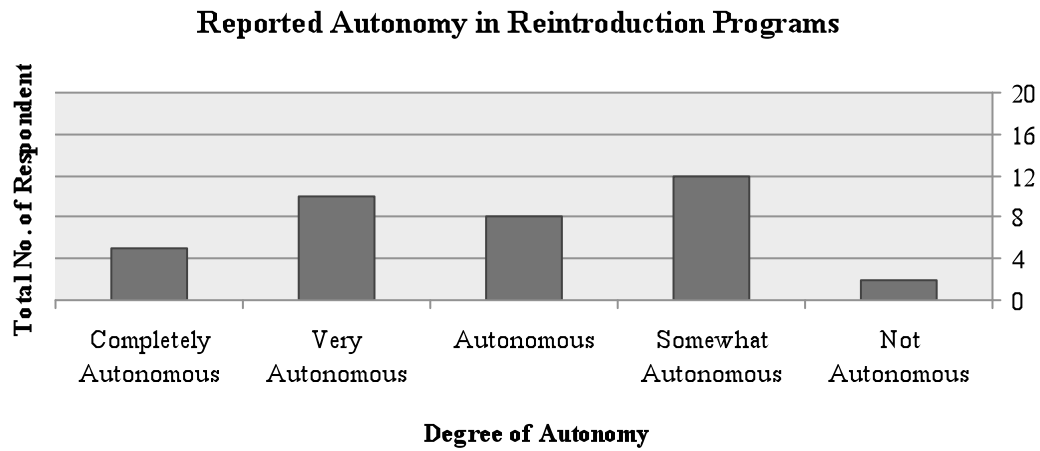


Figure 5. Reported Degrees of Autonomy in Reintroduction Programs.

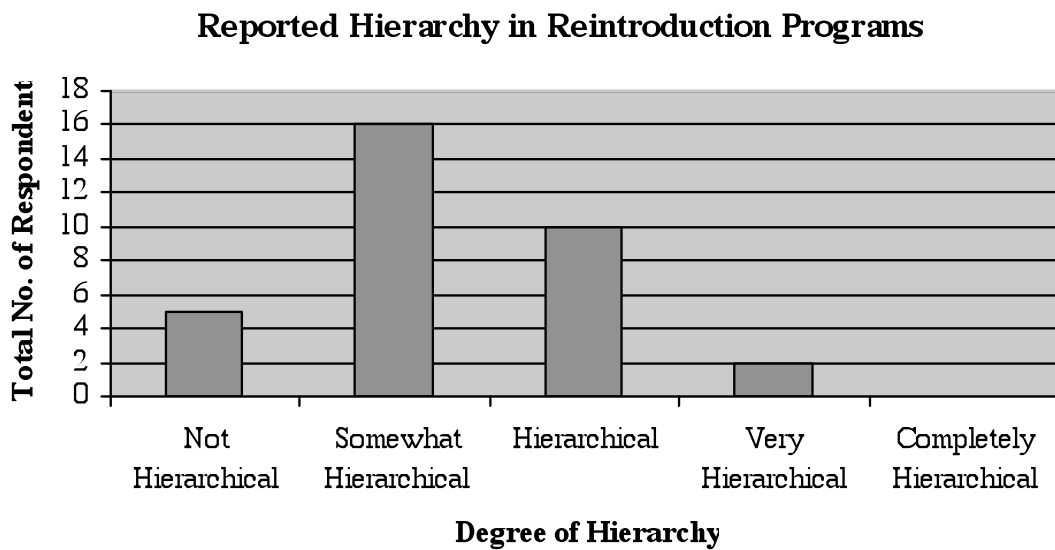


Figure 6. Reported Degrees of Hierarchy in Reintroduction Programs.

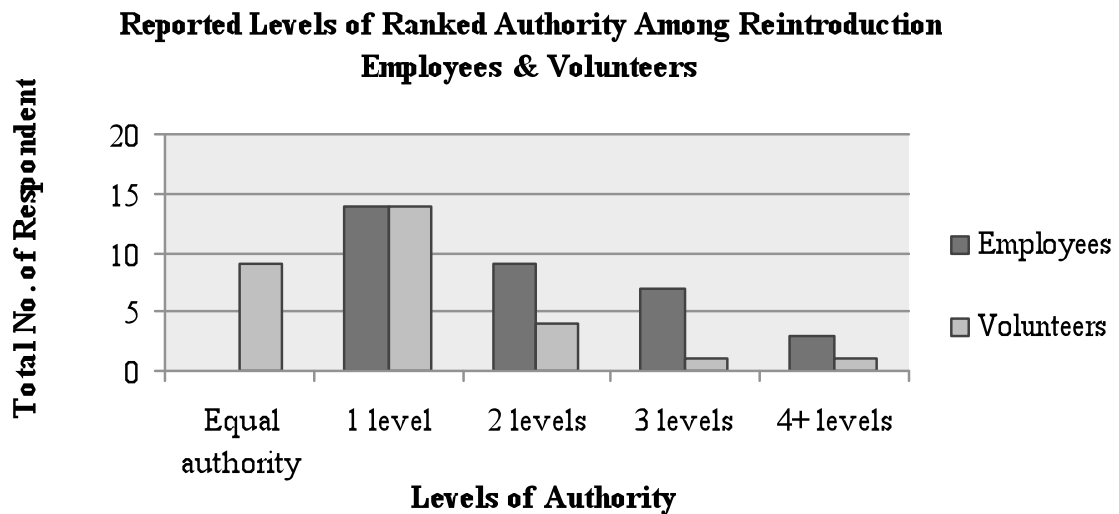


Figure 7. Reported Levels of Ranked Authority among Reintroduction Employees and Volunteers.

### Goals, Evaluation, and Accountability

General meetings were most commonly reported as being all-staff meetings and taking place annually (Figure 8). Meetings held specifically to determine, modify, or augment goals or targets for the program (“goal-setting meetings”) were most commonly reported to take place annually for long-term goals, and monthly for short-term goals (Figure 9). However, it should be noted that this represents two overlapping ranges, with short-term meetings taking place more frequently (as frequently as daily) and long-term meetings taking place more rarely (as rarely as never).

Subsequent evaluations of these goals were most commonly reported to take place annually (Figure 10), although internal program evaluations were reported twice as frequently as external evaluations. "Internal evaluations" were defined as formal or informal meetings, papers, or presentations that assessed or discussed the progress, success, or performance of the reintroduction relative to its stated goals or targets. These evaluations must have been conducted by entities or individuals who were also employees or volunteers with the reintroduction project. "External evaluations" were defined as formal or informal meetings, papers, or presentations that assessed or discussed the progress, success, or performance of the reintroduction relative to its stated goals or targets. These evaluations must have been conducted by entities or individuals who were not employees or volunteers with the reintroduction project.

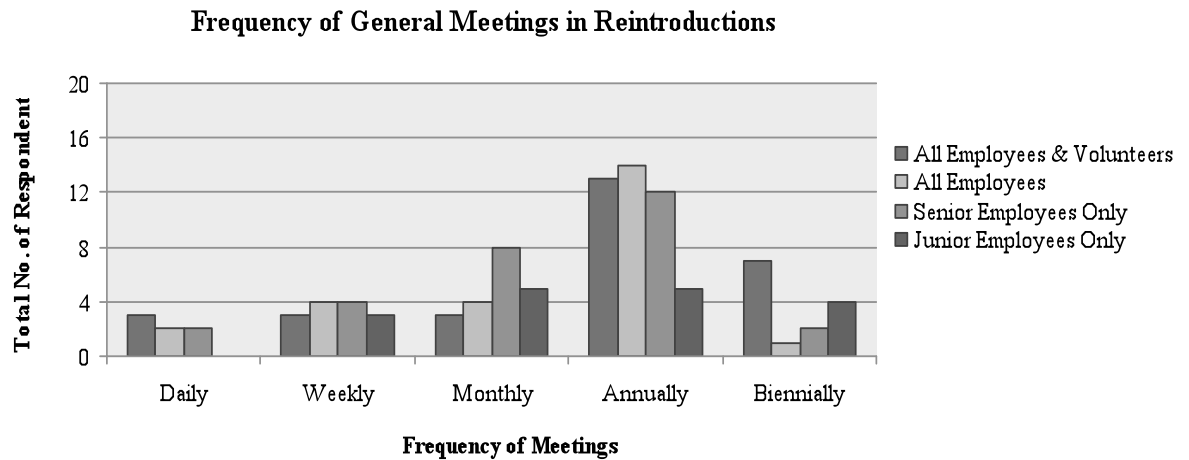


Figure 8. Reported Frequency of General Meetings in Reintroduction Programs.

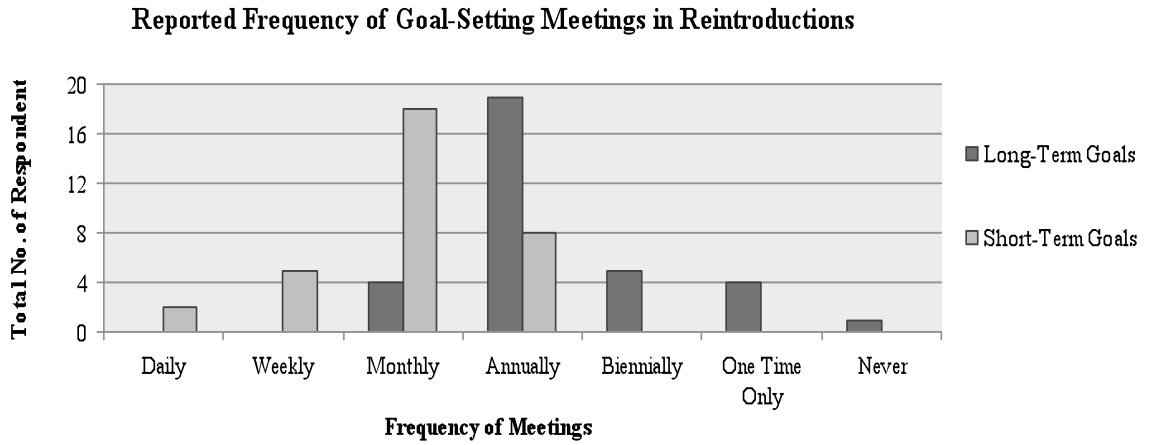


Figure 9. Reported Frequency of Goal-Setting Meetings in Wildlife Reintroduction Programs.

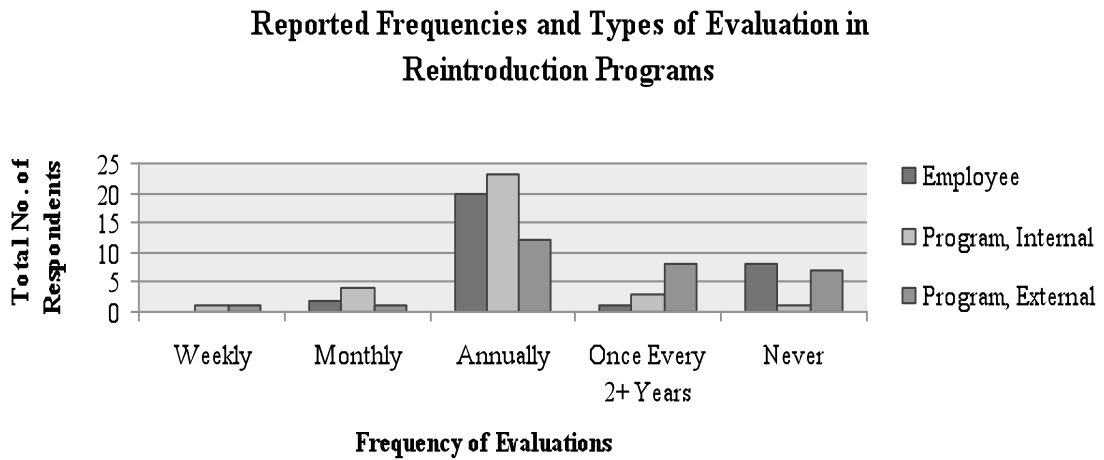


Figure 10. Reported Frequencies and Types of Evaluation in Wildlife Reintroduction Programs.

## Public Relations and Outreach

In general, programs had little to no staff dedicated specifically either to public relations/media affairs or public education and outreach (Figure 11). However, partnerships appeared to play a considerable role in reintroduction work. Conservation organizations and initiatives may partner with other entities, either in their fields or their communities, in order to broaden the scope of their projects and extend outreach capabilities. A “partnership” was defined as an ongoing, mutually recognized, formal or informal association between the reintroduction and one or more separate entities or organizations. Results from all partnership types indicated that reintroduction projects most commonly partnered with print media, national wildlife conservation organizations, or local community organizations. Programs were least commonly reported to partner with corporations/business or other reintroduction programs (Table 8).

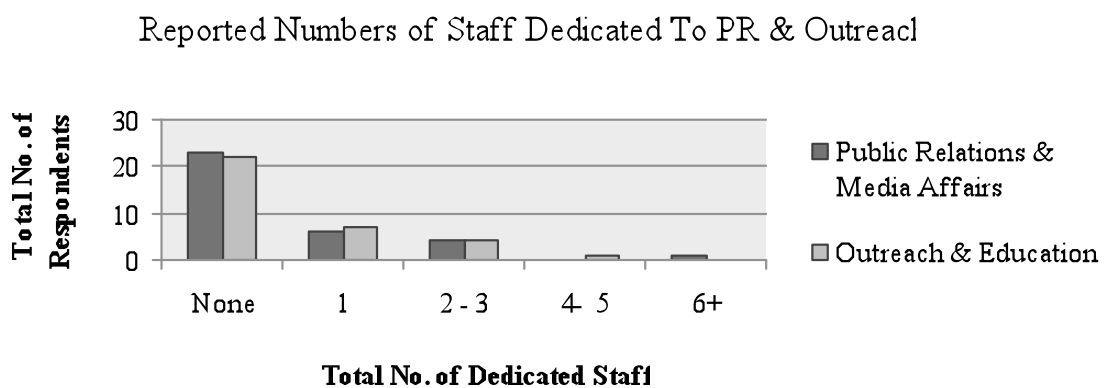


Figure 11. Reported Numbers of Staff Dedicated to Public Relations and Media Affairs or Public Outreach and Education.

Table 8. Reported Partnerships in Wildlife Reintroduction Programs.

Type of Media	No partnerships	1 - 2	3 - 4	5 - 6	7+	Total Reported Partnerships
Newspapers, magazines, or other forms of print media	9	13	8	0	2	23
Television/radio stations or other forms of audiovisual media	13	12	6	0	0	18
Websites, blogs, or other forms of internet media	13	13	5	0	1	19
Primary Schools	13	6	3	0	8	17
Secondary Schools	14	5	5	2	5	17
Colleges/ Universities	10	12	3	3	2	20
International Wildlife or Conservation Organizations	11	13	6	0	1	20
National Wildlife or Conservation Organizations	7	14	9	1	1	24
Regional, Local, or Community Organizations (i.e. community improvement groups)	7	10	7	3	4	24
Naturalist or Local Wildlife Enthusiast Organizations	11	11	4	3	3	21
Other Reintroduction Programs	18	10	3	1	1	15
Corporations or Businesses	18	8	4	1	1	14

### Perceptions and Evaluations of Success and Progress

Many respondents perceived their programs to be successful. However, a slight gap existed between those who felt their program was a success (57%) and those who reported that their programs had been formally evaluated as successful (63%). A wider gap existed between those who believed their reintroduction had made good progress (74%) and those whose programs had been formally evaluated as having made good progress (60%) (Figures 12–13).

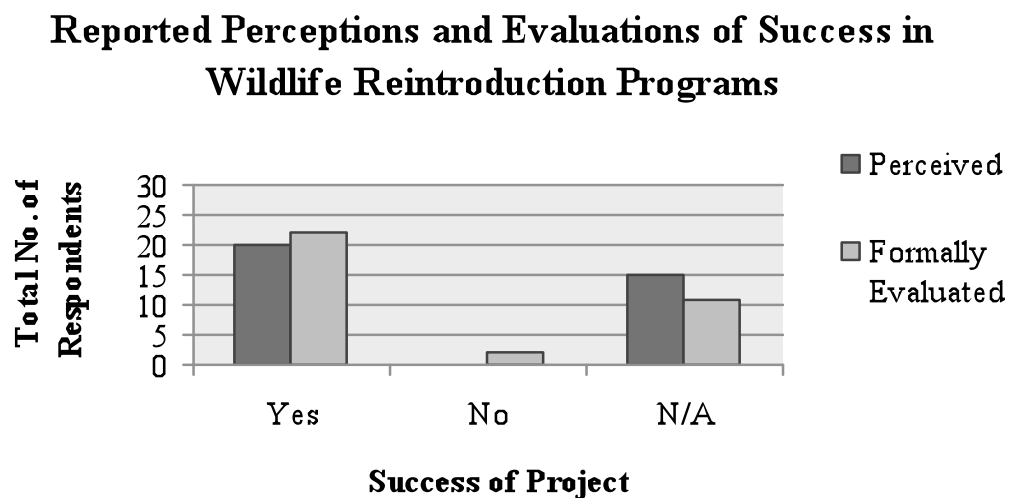


Figure 12. Reported Perceptions and Evaluations of Success in Wildlife Reintroduction Programs.



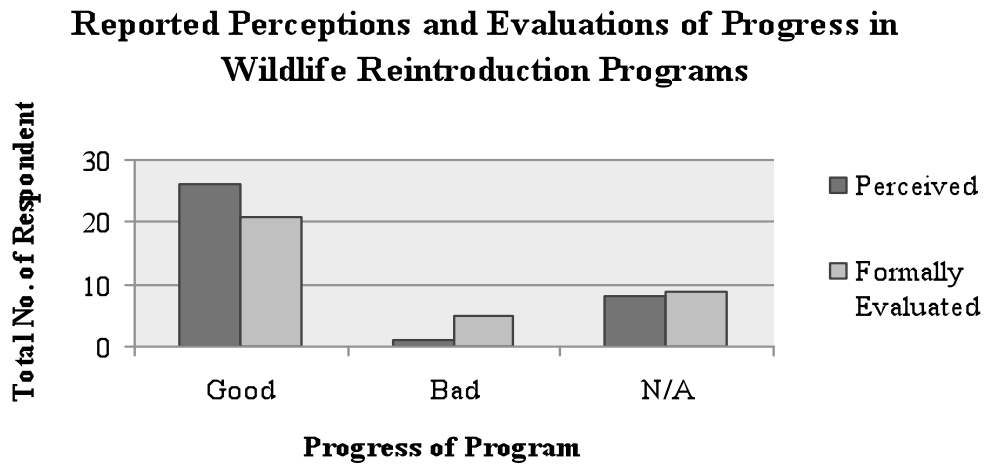


Figure 13. Reported Perceptions and Evaluations of Progress in Wildlife Reintroduction Programs.

## DISCUSSION

The survey method yielded salient and valuable information regarding trends in the management of reintroduction programs. The benefit of knowing these trends lies in the ability to recognize management behaviors and organizational habits common to all reintroductions. If patterns can be identified across multiple reintroduction programs, then that knowledge can lay the groundwork for manipulative experimental designs. The ability to design and undertake controlled experiments regarding reintroduction management could improve not only the quality of scientific endeavors taking place within reintroduction biology, but the quality of reintroduction biology itself.

*Reintroduction Partnerships.* —The question of partnerships can be tricky for any conservation initiative. Certainly, partnering with a likeminded organization can be appealing, as it can allow a project to target new demographics, to reach previously inaccessible audiences, and to stretch its resources farther than it could alone. However, partnerships can also mean increases in costs, through increased capital spending, personnel management, mediation and liaisons, etc. Trends in the survey indicated that reintroduction programs had limited partnership participation. This may indicate a deliberate course of action, intended to avoid unnecessary expenditures in a conservation initiative that is already stretched thin. However, it may also be indicative of an overlooked opportunity in conservation planning. In order to judge the value of partnerships, a more thorough examination of the benefits and costs of partnering for reintroduction programs would have to be undertaken.

*Autonomy and Hierarchy.* —Autonomy and hierarchy generally indicated that reintroduction programs tended to have low hierarchy and limited task supervision. This fits with Clark and Westrum's (1989) postulations about high-performance teams in reintroduction, in which they suggest that because reintroductions are high-pressure, fast-moving programs, team members must be able to work autonomously, but also capable of positive interaction with other participants. Autonomy reports varied widely, and this may be further support for the relationship suggested by Dodd and Ganster (1996), who suggest that autonomy matters only insofar as it is relative to task type (high vs. low variety).

*Goal-Setting, Evaluation, and Accountability.* —The general trend of the results tended towards annual all-staff meetings and employee evaluations. Program evaluations, when undertaken, were generally internal and annual. This trend is reflected in the reintroduction literature, in which annual reports of a species' progress are common, but hypothetico-deductive experimental designs are rare (Seddon et al. 2007). Furthermore, it highlights the lack of rigorous evaluation in conservation lamented by Kleiman et al. (1999), and supported by a literature review of accountability publications. Accountability has been found to influence performance evaluation in unusual and sometimes counterintuitive ways. For example, when an individual evaluating project performance feels accountable to the individuals or projects being rated, the rater is more likely to provide a higher score. The closer the relationship between rater and ratee, the more likely ratings are to be skewed positively (Roch and McNall 2007).

This means that internal evaluations, wherein evaluator and evaluated both feel a sense of accountability towards each other, may lend itself towards biased reporting. A clearer picture of the program and its performance can be gained through rigorous external evaluation. Thus, the findings of accountability research underscore the need for rigorous, external evaluations in conservation biology, particularly in reference to high-pressure and high-contact initiatives such as reintroduction programs.

## **LIMITATIONS**

One of the limitations of this survey was its small sample size. I sent survey invitations to 401 recipients. Only 44 (11%) of invitees responded to and completed the

survey. Approximately 40 (10%) no longer worked in the field, had only conducted retrospective analyses of reintroduction and not participated in a program, or felt the survey did not encompass their experience. Another 25 (6%) were not contactable.

A further demographic issue is the limited type of information that I collected about survey participants. Because participants were not required to state their focal species, their major sponsors (e.g. NGO, government, private party), their region of operation, or the total duration of their project, there is no way to parse this data further to determine the scale at which any perceived effects might be operating.

Clearly, an improved survey response rate, as well as more specific demographic information would yield more precise results; however, given the specialized nature of the survey and range of respondents (Figure 1–2), I still feel that accurate preliminary conclusions can be drawn from this survey data.

Another limitation was the lack of objective criteria I provided for success reporting. Measures of success and progress were self-reported, and no bounding definition was offered within the survey. Therefore, responses received may reflect a wide variety of definitions of success, and the concluding questions of the survey do not merit as much scientific interest as the preceding sections.

A further limitation is the lack of definition I provided for the term “self-sustaining” when used in reference to reintroduced animal populations. Although this question referred to populations having an alpha value greater than 1, this was not made explicitly clear in the survey, and may have reduced the reliability of question 5 (Appendix B).

## **CHAPTER IV**

### **CONCLUSIONS AND FUTURE DIRECTIONS FOR REINTRODUCTION RESEARCH**

#### **INTRODUCTION**

The ultimate outcome of this thesis has taken the form of 6 central conclusions about the future of reintroduction research. In order to improve, broaden, and enrich reintroduction research, I recommend that reintroduction biologists seek to: (1) maintain hierarchy (Chapter II); (2) experiment with autonomy (Chapter II, III); (3) develop partnerships (Chapter III); (4) improve and externalize evaluation (Chapter III); (5) invest in high-quality public relations (Chapter II); and (6) make use of interdisciplinary approaches.

#### **SUMMARY OF RESULTS**

##### **Maintain Hierarchy**

Interview results indicated that a hierarchical design and clear division of responsibilities may have had positive effects on the reintroduction process. In complex conservation initiatives, certainty of one's job and duties can streamline operations within a team and improve outcomes.

##### **Experiment with Autonomy**

Because preliminary results have not yet shown completely how autonomy relates to the efficacy of program processes, the necessary solution is to design hypothetico-deductive experiments to study its influence.

### **Develop Partnerships**

Although partnerships were reported by most respondents, 3 types of partnerships dominated. Exploration of other partnership types (e.g. corporate partnerships) may have value for future reintroduction work.

Furthermore, partnerships formed with other reintroduction programs were reported infrequently (<50% of respondents). If communication between reintroduction programs could be increased and improved through partnership, better knowledge-sharing and more efficient reintroduction processes might result.

### **Invest in High-Quality Public Relations**

The relationship between public relations work and program performance is one that should be investigated further, with more precise assessment tools. However, preliminary data clearly indicates that maintaining high-quality public relations over time can have a positive effect on participant experiences.

### **Improve and Externalize Evaluation**

As many others have already pointed out, the lack of evaluation in conservation initiatives is a major stumbling block to their progress and improvement. Without regular, rigorous evaluation, reintroduction programs may find themselves doomed to repeat the failures and oversights of the past. Furthermore, research published in the management and business literature is explicit about the possible risks associated with internal review in high-contact, high-pressure corporate environments that parallel experience of a reintroduction program. This should encourage reintroduction biologists to value external evaluations and reviews in the pursuit of accuracy.

### **Interdisciplinary Approaches**

Lastly, I encourage reintroduction biologists to embrace interdisciplinary research. Elements of sociology, business, finance, political science, psychology, anthropology, and many other disciplines manifest themselves strongly in reintroduction research, and their value must not be overlooked. The fields of sociology, marketing, communications and anthropology have been invaluable in the process of this thesis, and I have no doubt that they would be useful tools for any researcher in the field.

### **CONCLUSION**

Now that this thesis has identified a few of the apparent trends in reintroduction leadership and management, the next step will be to explore those trends through manipulative experiments. By varying the amount of hierarchy or autonomy in a program, increasing or decreasing the frequency of evaluation, or establishing and augmenting new partnership and public outreach methods, reintroduction biology can find new ways to improve program management and structure. This thesis sought to identify and explore some trends and areas of focus for fruitful future research in reintroduction biology, and now that those have been described here, I hope that future researchers will take this opportunity to continue this vein of research, and advance the field even farther forward.

### LITERATURE CITED

- Armstrong, D. P., and P. J. Seddon. 2007. Directions in reintroduction biology. *Trends in Ecology and Evolution* 23: 20–25.
- Armstrong, D. P., R. S. Davidson, W. J. Dimond, J. K. Perrott, I. Castro, J. G. Ewen, R. Griffiths, and J. Taylor. 2002. Population dynamics of reintroduced forest birds on New Zealand islands. *Journal of Biogeography* 29: 609–621.
- Bainbridge, L.P., R. J. Evans, R. A. Broad, C. H. Crooke, K. Duffy, R. E. Green, J. A. Love, and G. P. Mudge. 2002. Re-introduction of white-tailed eagles (*Haaliaeetus albicilla*) to Scotland. Pages 393–406 in D. B. A. Thompson, editor. *Birds of Prey in a Changing Environment*. The Stationary Office, Perth, Scotland, UK.
- Beck, B. B., L. G. Rapaport, M. R. Stanley Price, A. C. Wilson. 1994. Reintroduction of captive-born animals. Pages 265–284 in P. J. S. Olney, G. M. Mace, and A. T. C. Feistner, editors. *Creative Conservation: Interactive Management of Wild and Captive Animals*. Chapman and Hall, London, United Kingdom.
- Beissinger, S. R. 1990. On the limits and directions of conservation biology. *BioScience* 40: 456–457.
- Bennett, R., and H. Gabriel. 2001. Reputation, trust and supplier commitment: the case of shipping company/seaport relations. *Journal of Business and Industrial Marketing* 16: 424–438.
- Bertram, B. C. R., and D. P. Moltu. 1986. Reintroducing red squirrels into Regent's Park. *Mammal Review* 16: 81–88.



Brandon, K. E., and M. Wells. 1992. Planning for people and parks: design dilemmas.

*World Development* 20: 557–570.

British Broadcasting Company (BBC). 2008. Young sea eagles are 'doing well'.

22 February 2008. Available from

[http://news.bbc.co.uk/2/hi/uk\\_news/scotland/tayside\\_and\\_central/7259363.stm](http://news.bbc.co.uk/2/hi/uk_news/scotland/tayside_and_central/7259363.stm)

(accessed February 2008).

California Condor Conservation (CCC). 2008. California Condor Recovery Program.

Available from <http://cacondorconservation.org/content/programs/> (accessed

March 2008).

Caracelli, V. J., Greene, J. C. (1993). Data analysis strategies for mixed-method

evaluation designs. *Educational Evaluation and Policy Analysis* 15: 195–207.

Central Intelligence Agency World Factbook (CIA). 2009a. United Kingdom.

Available from [https://www.cia.gov/library/publications/the-world-](https://www.cia.gov/library/publications/the-world-factbook/geos/UK.html)

[factbook/geos/UK.html](https://www.cia.gov/library/publications/the-world-factbook/geos/UK.html) (accessed 8 June 2009).

Central Intelligence Agency World Factbook (CIA). 2009b. United States of America.

Available from [https://www.cia.gov/library/publications/the-world-](https://www.cia.gov/library/publications/the-world-factbook/geos/US.html)

[factbook/geos/US.html](https://www.cia.gov/library/publications/the-world-factbook/geos/US.html) (accessed 8 June 2009).

Clark, T. W., and R. Westrum. 1989. High-performance teams in wildlife conservation:

a species reintroduction and recovery example. *Environmental Management* 13:

663-670.

Creswell, J.W. 2007. *Qualitative Inquiry and Research Design: Choosing Among Five*

*Approaches*. 2nd edition. Sage Publishers, Thousand Oaks, CA, USA.

- Cunningham, A. A. 1996. Disease risks of wildlife translocations. *Conservation Biology* 10: 349–353.
- Dalton, D. R., W. D. Todor, M. J. Spendolini, G. J. Fielding, and L. W. Porter. 1980. Structure and performance: a critical review. *Academy of Management Review* 5: 49–64.
- Delroy, L. B., J. Earl, I. Radbone, A. C. Robinson, and M. Hewett. 1986. The breeding and reestablishment of the brush-tailed bettong, *Bettongia penicillata*, in south Australia. *Australian Wildlife Research* 13: 387–396.
- Dietz, L. A., and E. Nagagata. 1986. Community conservation education program for the golden lion tamarin. J. Atkinson, editor. Pages 8–16 in *Building Support for Conservation in Rural Areas: Workshop Proceedings Vol. 1*. QLF-Atlantic Center for the Environment, Ipswich, MA, USA.
- Dodd, N. G., and D. C. Ganster. 1996. The interactive effects of variety, autonomy, and feedback on attitudes and performance. *Journal of Organizational Behavior* 17: 329–347.
- Dzialak, M. R., M. J. Lacki, and S. Vorisek. 2005. Survival, mortality, and morbidity among peregrine falcons reintroduced in Kentucky. *Journal of Raptor Research* 41: 61–65.
- Erlandson, D.A. 1993. *Doing Naturalistic Inquiry*. Sage Publishing, Newbury Park, CA, USA.
- Farh, J. L., and W. E. Scott, Jr. 1983. The experimental effects of "autonomy" on

- performance and self-reports of satisfaction. *Organizational Behavior and Human Performance* 31: 203–222.
- Ferraro, P.J., and S. K. Pattanyak. 2006. Money for nothing? A call for empirical evaluation of biodiversity conservation investments. *PLoS Biology* 4: e105.
- Fischer, J., and D. B. Lindenmayer. 2000. An assessment of the published results of animal relocations. *Biological Conservation* 96: 1–11.
- Fleishman, E., G. H. Wolff, C. L. Boggs, P. R. Ehrlich, A. E. Launer, J. O. Niles, and T. H. Ricketts. 1999. Conservation in practice: overcoming obstacles to implementation. *Conservation Biology* 13: 450–452.
- Goodman, L. A. 1961. Snowball sampling. *Annals of Mathematical Statistics* 32:148–170.
- Green, R. E., M. W. Pienkowski, J. A. Love. 1996. Long-term viability of the re-introduced population of the white-tailed eagle *Haaliaetus albicilla* in Scotland. *The Journal of Applied Ecology* 33: 357–368.
- Groom, M. J., Meffe, G. K., and C. R. Carroll. 2005. *Principles of Conservation Biology*, 3rd edition. Sinauer Associates, Sunderland, MA, USA.
- Gugiu, P. C., and L. Rodriguez-Campos. 2007. Semi-structured interview protocol for constructing logic models. *Evaluation and Program Planning* 30: 339–350.
- Halachmi, A. 2002. Performance measurement: a look at some possible dysfunctions. *Work Study: A Journal of Productivity Science* 51: 230–239.
- Horwich, R. H., and J. Lyon. 2007. Community conservation: practitioners' answer to critics. *Oryx* 41: 376–385.

- International Union for the Conservation of Nature and Natural Resources (IUCN). 1998. Guidelines for reintroductions. IUCN/SSC Re-introduction Specialist Group, Gland, Switzerland and Cambridge, UK.
- Jacobson, S. K., and M. D. McDuff. 1998. Training idiot savants: the lack of human dimensions in conservation biology. *Conservation Biology* 12:263–267.
- Jensen, M. C., and W. H. Meckling. 1990. Specific and general knowledge, and organizational structure. *Journal of Applied Corporate Finance* 8: 4–18.
- John, G., and J. Martin. 1984. Effects of organizational structure of marketing planning on credibility and utilization of plan output. *Journal of Marketing Research* 21: 170–183.
- Johnson, R. B., and A. J. Onwuegbuzie. 2004. Mixed methods research: a research paradigm whose time has come. *Educational Researcher* 33: 14–26.
- Joint Nature Conservation Committee (JNCC). 1988. The reintroduction of the white-tailed sea eagle to Scotland: 1975-1987. Report Series: Research and Survey in Nature Conservation Series No. 12. JNCC Publications, Inverness, Scotland, UK.
- Joint Nature Conservation Committee (JNCC). 2008. About JNCC. Available from <http://www.jncc.gov.uk/page-1729> (accessed February 2008).
- Kleiman, D. G. 1989. Reintroduction of captive mammals for conservation. *BioScience* 39: 152–161.
- Kleiman, D.G., R. P. Reading, B. J. Miller, T. W. Clark, J. M. Scott, J. Robinson, R. L. Wallace, R. J. Cabin, and F. Felleman. 1999. Improving the evaluation of conservation programs. *Conservation Biology* 14: 356–365.

- Kleiman, D.G., M. R. Stanley Price, and B. B. Beck. 1994. Criteria for reintroductions. P. J. S. Olney, G. M. Mace, and A. T. C. Feistner, editors. Pages 287–300 in *Creative Conservation: Interactive Management of Wild and Captive Animals*. Chapman and Hall, London, United Kingdom.
- Langfred, C.W. 2000. Work-group design and autonomy: A field study of the interaction between task interdependence and group autonomy. *Small Group Research* 31: 54–70.
- Likert, R. 1932. A technique for the measurement of attitudes. *Archives of Psychology* 140:1–55.
- Lincoln, Y., and Guba, E. 1985. *Naturalistic Inquiry*. Sage Publishing, Newbury Park, CA, USA.
- Lipsey, M. K, and M. F. Child. 2007. Combining the fields of reintroduction biology and restoration ecology. *Conservation Biology* 21: 1387–1390.
- Lomolino, M. V., and R. Channell. 1995. Splendid isolation: patterns of range collapse in endangered mammals. *Journal of Mammalogy* 76: 335-347.
- Love, J. A. 1983. *Return of the Sea Eagle*. Cambridge University Press, Cambridge, UK.
- Love, J. A. 2006. *Sea Eagles: Naturally Scottish*. Scottish Natural Heritage Publishing Unit, Perth, UK.
- Marcus, A. C., and L. A. Crane. 1986 Telephone surveys in public health research. *Medical Care* 24: 97-112.
- Marshall, K. B., R. White, and A. Fisher. 2007. Conflicts between humans over wildlife

- management: on the diversity of stakeholder attitudes and implications for conflict management. *Biodiversity and Conservation* 16: 3129–3146.
- McCarty, J. P. 2001. Ecological consequences of recent climate change. *Conservation Biology* 15: 320–331.
- Morris, P. A. 1986. An introduction to reintroductions. *Mammal Review* 16: 49–52.
- Mudge, G., K. Duffy, K. Thompson, and J. A. Love. 1996. *Naturally Scottish: Sea Eagles*. Scottish Natural Heritage Design and Publications, Perth, UK.
- National Research Council (NRC) Committee on Scientific Issues in the Endangered Species Act. 1995. *Science and the Endangered Species Act*. National Academies Press, Washington, DC, USA.
- Nichols, J. D., and B. K. Williams. 2006. Monitoring for conservation. *Trends in Ecology and Evolution* 21: 668–673.
- Ostermann, S. D., J. R. Deforge, W. D. Edge. 2001. Captive breeding and reintroduction evaluation criteria: a case study of peninsular bighorn sheep. *Conservation Biology* 15: 749–760.
- Phillips, D. 2006. Relationships are the core value for organisations: A practitioner perspective. *Corporate Communications: An International Journal* 11: 34–42.
- Pullin, A. S., and G. B. Stewart. 2006. Guidelines for systematic review in conservation and environmental management. *Conservation Biology* 20: 1647–1656.
- Qualtrics Online Survey Software. 2009. Available from <http://www.qualtrics.com> (accessed March 2009).
- Reading, R. P., and S. R. Kellert. 1993. Attitudes toward a proposed reintroduction of

- black-footed ferrets (*Mustela nigripes*). *Conservation Biology* 7: 569–580.
- Roch, S. G., and L. A. McNall. 2007. An investigation of factors influencing accountability and performance ratings. *The Journal of Psychology* 141: 499–523.
- Royal Society for the Protection of Birds (RSPB). 2005. Information: White-tailed eagle. Royal Society for the Protection of Birds, Scotland Headquarters, Edinburgh, Scotland, UK.
- Royal Society for the Protection of Birds (RSPB). 2006. White-tailed eagles. Royal Society for the Protection of Birds, Scotland Headquarters, Edinburgh, Scotland, UK.
- Royal Society for the Protection of Birds (RSPB). 2007. Sea eagle project Newsletter 2007. Royal Society for the Protection of Birds, Scotland Headquarters, Edinburgh, Scotland, UK.
- Royal Society for the Protection of Birds (RSPB). 2008. About Us. Available from <http://www.rspb.org/about/index.asp> (accessed February 2007).
- Russell, R. D., and C. J. Russell. 1992. An examination of the effects of organizational norms, organizational structure, and environmental uncertainty on entrepreneurial strategy. *Journal of Management* 18: 639–656.
- Sarrazin, F., and R. Barbault. 1996. Reintroduction: challenges and lessons for basic ecology. *Trends in Ecology and Evolution* 11: 474–478.
- Scott, J. M., D. Murray, and B. Griffith. 1999. Lynx reintroduction. *Science* 286: 49–51.
- Scottish Natural Heritage (SNH). 1995. Species Action Programme. Scottish Natural

Heritage, Perth, Scotland, United Kingdom.

Scottish Natural Heritage (SNH). 2007. A Five Year Species Action Framework:

Making a Difference for Scotland's Species. Scottish Natural Heritage, Perth, Scotland, United Kingdom.

Scottish Natural Heritage (SNH). 2008. Sea Eagles. Return of a native: reintroduction.

Available from [http://www.snh.org.uk/publications/on-](http://www.snh.org.uk/publications/on-line/NaturallyScottish/seaeagles/page3.asp)

[line/NaturallyScottish/seaeagles/page3.asp](http://www.snh.org.uk/publications/on-line/NaturallyScottish/seaeagles/page3.asp) (accessed February 2007).

Seddon, P. J., D. P. Armstrong, and R. F. Maloney. 2007. Developing the science of reintroduction biology. *Conservation Biology* 21: 303–312.

Smeeton, C., and K. Weagle. 2000. The reintroduction of the swift fox *Vulpes velox* to South Central Saskatchewan, Canada. *Oryx* 34: 171–179.

Smith, K. N., J. H. Shaw, T. Bettinger, B. Caniglia, and T. Carter. 2007. Conservation partnerships between zoos and aquariums, federal and state agencies, and nongovernmental organizations. *Zoo Biology* 26: 471–486.

Smith, R. J., R. H. J. Muir, M. J. Walpole, A. Balmford, and N. Leader-Williams. 2003. Governance and the loss of biodiversity. *Nature* 426: 67–70.

Soulé, M. E. 1985. What is conservation biology? *BioScience* 35: 727-734.

Stake, R.E. 1995. *The Art of Case Study Research*. Sage Publishing, Thousand Oaks, CA, USA.

Stanley Price, M. R. 1986. The reintroduction of the Arabian oryx: into Oman.

*International Zoo Yearbook* 24: 179–188.

Stanley Price, M. R. 1989. Animal Reintroductions, the Arabian Oryx into Oman.



Cambridge, UK: Cambridge University Press.

- Stanley Price, M. R., and P. S. Soorae. 2003. Reintroductions: whence and whither? *International Zoo Yearbook* 38: 61–75.
- Steury, T. D., and D. L. Murray. 2004. Modeling the reintroduction of lynx to the southern portion of its range. *Biological Conservation* 117: 127–141.
- Sturges, J.E., and K. J. Hanrahan. 2004. Comparing telephone and face-to-face qualitative interviewing: a research note. *Qualitative Research* 4: 107-118.
- Teixeira, C. P., C. Schetini de Azevedo, M. Mendl, C. F. Cipreste, and R. J. Young. 2007. Revisiting translocation and reintroduction programmes: the importance of considering stress. *Animal Behaviour* 73: 1–13.
- Tilbury, C. 2006. Accountability via performance measurement: the case of Child Protection Services. *Australian Journal of Public Administration* 65: 48–61.
- Wauters, L. A., L. Somers, and A. A. Dhondt. 1997. Settlement behaviour and population dynamics of reintroduced red squirrels *Sciurus vulgaris* in a park in Antwerp, Belgium. *Biological Conservation* 82: 101–107.
- Wolf, C. M., B. Griffith, C. Reed, and S. A. Temple. 1996. Avian and mammalian reintroductions: update and reanalysis of 1987 survey data. *Conservation Biology* 10: 1142–1154.
- Wolf, C. M., T. Garland Jr, and B. Griffith. 1998. Predictors of avian and mammalian translocation success: reanalysis with phylogenetically independent contrasts. *Biological Conservation*. 86: 243–255.
- Yin, R. K. 2003. *Case Study Research: Design and Methods*. 3rd edition. Sage

Publishing, Thousand Oaks, CA, USA.

## APPENDIX A

### SAMPLE INTERVIEW PROTOCOL

Interviewer Name: \_\_\_\_\_

Date: \_\_\_\_\_

Interview Number: \_\_\_\_\_

Location of Interview: \_\_\_\_\_

Interviewee Number: \_\_\_\_\_

Place of Birth:

Place of Residence:

Length of Time Living in Country/Current Residence:

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#### *About Your Experiences with Wildlife*

Do you encounter wildlife around your home? If so, how frequently? What are these encounters like?

Do you encounter white-tailed eagles around your workplace? If so, how frequently? What are these encounters like?

Had you ever studied white-tailed eagles prior to working with the reintroduction program?

Had you ever seen a white-tailed eagle prior to the reintroduction program? If so, how frequently? In what context?

Did you ever see a white-tailed eagle after you began working with the reintroduction program? If so, how frequently? In what context?

Prior to the WTE, had you ever worked on or participated in any reintroduction program?

During/after the WTE, did you work on or participate in any other reintroduction program?

-----  
*About the Reintroduction Program*

In which phases of the reintroduction have you been involved?

[Eagle: Phase 1 – Isle of Rum; Phase 2 – Wester Ross; Phase 3 – East Coast (Fife)]

[Condor: Phase 1 – Rescue/Capture and Captive Breeding; Phase 2 – Los Padres/Hopper Mountain; Phase 3 – Vermillion Cliffs; Phase 4 – Pinnacles and Today]

Who was your employer during each phase of the reintroduction in which you participated?

Who is your current employer?

What was your job title/position during each phase of the reintroduction in which you participated?

Did any other people hold your same position during your time working with the reintroduction?

To whom were you responsible while you held this position? What were their positions? Under which entities were they employed?

Were you ever responsible for any employees/volunteers while you held this position? What were their positions? Under which entities were they employed?

Approximately how many other people were employed to work on the reintroduction under your same entity?

Have you participated in or been present at any releases? If so, which ones?

-----  
*About the Organizational Structure and Decision-Making Process*

What was the organizational structure of the reintroduction program like? Has it changed since you began working on the reintroduction? If so, in what ways?

How many levels of management existed?

What was the highest level of management/responsibility?

What was the organizational culture of the reintroduction program like? Was it very hierarchical, or more team-oriented?

How were ultimate decisions, about the overall purpose and direction of the reintroduction program, made? By whom?

How were proximate decisions, about the day-to-day operation of the program made? By whom? Did statements of proximate goals exist for this reintroduction? If so, how were these goals set? By whom?

Did a mission statement/statement of ultimate goals exist for this reintroduction? Did it change?

How were responsibilities divided/assigned within the reintroduction program? By whom?

Did regular evaluations take place within the reintroduction? How frequently? By whom?

-----

*About Your Opinion on Evaluating Wildlife Reintroduction Programs*

In your opinion, what would define a success in any wildlife reintroduction?

In your opinion, what would define a failure in any wildlife reintroduction?

By what measures do you believe that any wildlife reintroduction program can be evaluated? Biological? Social?

How would you evaluate the status of this reintroduction?

Do you believe this reintroduction could be improved? If so, in what ways?

Do you plan to work with this reintroduction in the future? If so, in what capacity?

Do you plan to work with any other reintroductions in the future? If so, in what capacity?

**Is there anything else you'd like to add?**

Thank you for your time!

## APPENDIX B

### LEADERSHIP AND MANAGEMENT OF WILDLIFE REINTRODUCTIONS

#### SURVEY RESULTS

**1. Approximately how long was the “planning phase” of your reintroduction project? This refers to the length of time that it took to conceive and plan the reintroduction project.**

#	Answer	Response	%
1	1 - 3 months	1	3%
2	4 - 8 months	1	3%
3	9 months - 1 year	7	19%
4	1 - 3 years	15	41%
5	4+ years	13	35%
	Total	37	100%

Statistic	Value
Mean	4.03
Variance	0.92
Standard Deviation	0.96
Total Responses	37

**2. Approximately how long was the “approval phase” of your reintroduction project? This refers to the length of time that it took to gain permission from government agencies or leading organizations to reintroduce this species.**

#	Answer	Response	%
1	1-3 months	8	22%
2	4 - 8 months	2	5%
3	9 months - 1 year	10	27%
4	1 - 3 years	12	32%
5	4+ years	5	14%
	Total	37	100%

Statistic	Value
Mean	3.11
Variance	1.82
Standard Deviation	1.35
Total Responses	37

**3. Approximately how long was “action phase” of your reintroduction project? This refers to the duration of time that animals were actually captured, captive bred, raised, fledged or hacked, and released into the wild.**

#	Answer	Response	%
1	1 - 3 months	2	6%
2	4 - 8 months	1	3%
3	9 months - 1 year	3	8%
4	1 - 3 years	7	19%
5	4+ years	23	64%
	Total	36	100%

Statistic	Value
Mean	4.33
Variance	1.26
Standard Deviation	1.12
Total Responses	36

**4. Approximately how long was the “monitoring phase” of your reintroduction project? This refers to the length of time that reintroduced animals or populations were monitored post-release.**

#	Answer	Response	%
1	1 - 3 months	2	6%
2	4 - 8 months	0	0%
3	9 months - 1 year	1	3%
4	1 - 3 years	6	17%
5	4+ years	26	74%
	Total	35	100%

Statistic	Value
Mean	4.54
Variance	1.02
Standard Deviation	1.01
Total Responses	35

**5. Approximately how long did it take your project to establish a breeding, self-sustaining population of reintroduced animals?**

#	Answer	Response	%
1	1 - 3 months	0	0%
2	4 - 8 months	0	0%
3	9 months - 1 year	2	7%
4	1 - 3 years	9	30%
5	4+ years	19	63%
	Total	30	100%

Statistic	Value
Mean	4.57
Variance	0.39
Standard Deviation	0.63
Total Responses	30

**6. How closely did your program attempt to adhere to the Reintroduction Guidelines set forth by the World Conservation Union (IUCN)?**

#	Answer	Response	%
1	Very Closely	13	38%
2	Closely	14	41%
3	Somewhat Closely	6	18%
4	Not Closely At All	1	3%
	Total	34	100%

Statistic	Value
Mean	1.85



Variance	0.67
Standard Deviation	0.82
Total Responses	34

**7. What type of position did you hold during the majority of your time with the reintroduction project?**

#	Answer	Response	%
1	Volunteer	3	8%
2	Intern/Student Trainee	1	3%
3	Junior Employee	4	11%
4	Senior Employee	17	46%
5	Founder	12	32%
	Total	37	100%

Statistic	Value
Mean	3.92
Variance	1.30
Standard Deviation	1.14
Total Responses	37

**8. How much experience did you have with reintroductions at the time you took on this position?**

#	Answer	Response	%
1	Less than a year	11	30%
2	1 - 3 years	12	32%
3	4 - 7 years	3	8%
4	8 - 11 years	2	5%
5	12+ years	9	24%
	Total	37	100%

Statistic	Value
Mean	2.62
Variance	2.46

Standard Deviation	1.57
Total Responses	37

### 9. What was the primary responsibility of your position?

#	Answer	Response	%
1	Administrative work	1	3%
2	Fieldwork	12	32%
3	Supervisory work	16	43%
4	Public Relations work	1	3%
5	Other	7	19%
	Total	37	100%

Statistic	Value
Mean	3.03
Variance	1.25
Standard Deviation	1.12
Total Responses	37

### 10. How frequently were these responsibilities shared with coworkers?

#	Answer	Response	%
1	Never	2	5%
2	Rarely	5	14%
3	Occasionally	5	14%
4	Frequently	17	46%
5	Always	8	22%
	Total	37	100%

Statistic	Value
Mean	3.65
Variance	1.29
Standard Deviation	1.14
Total Responses	37

### 11. How frequently were these responsibilities monitored directly by supervisors?

#	Answer		Response	%
1	Never		6	16%
2	Rarely		16	43%
3	Occasionally		3	8%
4	Frequently		5	14%
5	Always		7	19%
	Total		37	100%

Statistic	Value
Mean	2.76
Variance	1.97
Standard Deviation	1.40
Total Responses	37

### 12. How frequently were these responsibilities monitored indirectly by supervisors?

#	Answer		Response	%
1	Never		4	11%
2	Rarely		11	31%
3	Occasionally		7	19%
4	Frequently		7	19%
5	Always		7	19%
	Total		36	100%

Statistic	Value
Mean	3.06
Variance	1.77
Standard Deviation	1.33
Total Responses	36

### 13. How frequently was your performance evaluated by supervisors?

#	Answer	Response	%
1	Daily	1	3%
2	Weekly	1	3%
3	Monthly	3	9%
4	Seasonally	10	30%
5	Annually	18	55%
	Total	33	100%

Statistic	Value
Mean	4.30
Variance	0.97
Standard Deviation	0.98
Total Responses	33

### 14. How autonomous was your position within the reintroduction project?"Autonomy" refers to the ability of a staff member to operate independent of direct supervision, and to make decisions which may influence the outcome of the reintroduction without first processing the action through a bureaucratic procedure.

#	Answer	Response	%
1	Not Autonomous	2	5%
2	Somewhat Autonomous	12	32%
3	Autonomous	8	22%
4	Very Autonomous	10	27%
5	Completely Autonomous	5	14%
	Total	37	100%

Statistic	Value
Mean	3.11
Variance	1.38
Standard Deviation	1.17
Total Responses	37

**15. Approximately how many employees of each type did your project have? As stated above, “junior” refers to positions such as or equivalent to: interns, seasonal hires, contract, short-term and entry-level employees. “Senior” refers to positions such as or equivalent to salaried team members, consultants, administrators, coordinators, executives and managers.**

#	Question	none	1 - 3	4 - 7	8 - 11	12+	Responses	Mean
1	Full-time Senior Staff	4	21	5	1	1	32	2.19
2	Full-time Junior Staff	5	13	6	0	2	26	2.27
3	Full-time Volunteer	15	5	4	0	0	24	1.54
4	Part-time Senior Staff	6	13	3	1	0	23	1.96
5	Part-time Junior Staff	7	11	2	1	1	22	2.00
6	Part-time Volunteer	3	10	3	4	9	29	3.21

Statistic	Full-time Senior Staff	Full-time Junior Staff	Full-time Volunteer	Part-time Senior Staff	Part-time Junior Staff	Part-time Volunteer
Mean	2.19	2.27	1.54	1.96	2.00	3.21
Variance	0.67	1.08	0.61	0.59	1.05	2.17
Standard Deviation	0.82	1.04	0.78	0.77	1.02	1.47
Total Responses	32	26	24	23	22	29

**16. Approximately many levels of authority existed between the most junior employee and the most senior employee in your project? A “level of authority” refers to one employee acting in a direct or indirect supervisory, administrative, or managerial role to another employee.**

#	Answer	Response	%
1	Equal authority	0	0%
2	1 level	14	42%
3	2 levels	9	27%
4	3 levels	7	21%
5	4+ levels	3	9%
	Total	33	100%

Statistic	Value
Mean	2.97
Variance	1.03
Standard Deviation	1.02
Total Responses	33

**17. Approximately many levels of authority existed between the most junior volunteer and the most senior volunteer in your project? A “level of authority” refers to one volunteer acting in a direct or indirect supervisory, administrative, or managerial role to another volunteer.**

#	Answer	Response	%
1	Equal authority	9	31%
2	1 level	14	48%
3	2 levels	4	14%
4	3 levels	1	3%
5	4+ levels	1	3%
	Total	29	100%

Statistic	Value
Mean	2.00
Variance	0.93
Standard Deviation	0.96
Total Responses	29

**18. How often did senior employees participate in the following activities?**

#	Question	Never	Rarely	Occas.	Freq.	Regular.	Responses	Mean
1	Administrative Work	0	2	6	9	16	33	4.18
2	Field Work	0	2	7	11	13	33	4.06
3	Public Relations/ Outreach	1	3	8	9	11	32	3.81
4	Supervision/ Management	0	0	6	9	17	32	4.34

Statistic	Administrative Work	Field Work	Public Relations/Outreach	Supervision/Management
Mean	4.18	4.06	3.81	4.34
Variance	0.90	0.87	1.25	0.62
Standard Deviation	0.95	0.93	1.12	0.79
Total Responses	33	33	32	32

### 19. How often did junior employees participate in the following activities?

#	Question	Never	Rarely	Occas.	Freq.	Regular.	Responses	Mean
1	Administrative Work	9	6	9	4	2	30	2.47
2	Field Work	3	1	3	7	16	30	4.07
3	Public Relations/Outreach	5	3	8	12	2	30	3.10
4	Supervision/Management	9	7	8	1	4	29	2.45

Statistic	Administrative Work	Field Work	Public Relations/Outreach	Supervision/Management
Mean	2.47	4.07	3.10	2.45
Variance	1.57	1.72	1.47	1.83
Standard Deviation	1.25	1.31	1.21	1.35
Total Responses	30	30	30	29

### 20. How often did volunteers participate in the following activities?

#	Question	Never	Rarely	Occas.	Freq.	Regular.	Responses	Mean
1	Administrative Work	17	9	2	2	0	30	1.63
2	Field Work	1	3	5	13	8	30	3.80

3	Public Relations/ Outreach	6	9	9	5	1	30	2.53
4	Supervision/ Management	19	7	2	0	2	30	1.63

Statistic	Administrative Work	Field Work	Public Relations/Outreach	Supervision/Management
Mean	1.63	3.80	2.53	1.63
Variance	0.79	1.13	1.22	1.21
Standard Deviation	0.89	1.06	1.11	1.10
Total Responses	30	30	30	30

**21. How hierarchical was the structure of your reintroduction project? “Hierarchy” refers to the arrangement of employees or positions in a graduated or ranked manner, with progressively greater authority and responsibilities attained at each level.**

#	Answer	Response	%
1	Not Hierarchical	5	15%
2	Somewhat Hierarchical	16	48%
3	Hierarchical	10	30%
4	Very Hierarchical	2	6%
5	Completely Hierarchical	0	0%
	Total	33	100%

Statistic	Value
Mean	2.27
Variance	0.64
Standard Deviation	0.80
Total Responses	33



**22. How often were meetings held to set or discuss the long-term goals of the reintroduction project?**

#	Answer	Response	%
1	Monthly	4	12%
2	Annually	19	58%
3	Biennially	5	15%
4	One Time Only	4	12%
5	Never	1	3%
	Total	33	100%

Statistic	Value
Mean	2.36
Variance	0.93
Standard Deviation	0.96
Total Responses	33

**23. How often were meetings held to set or discuss the short-term goals of the reintroduction project?**

#	Answer	Response	%
1	Daily	2	6%
2	Weekly	5	15%
3	Monthly	18	55%
4	Annually	8	24%
5	Never	0	0%
	Total	33	100%

Statistic	Value
Mean	2.97
Variance	0.66
Standard Deviation	0.81
Total Responses	33

**24. How often were meetings held which included ALL employees AND all volunteers? “Meetings” may refer to formal or informal planned gatherings held either inside or outside of reintroduction offices for the purposes of sharing information, assigning tasks, or evaluating performance.**

#	Answer		Response	%
1	Daily		3	10%
2	Weekly		3	10%
3	Monthly		3	10%
4	Annually		13	45%
5	Once Every 2+ Years		7	24%
	Total		29	100%

Statistic	Value
Mean	3.62
Variance	1.60
Standard Deviation	1.27
Total Responses	29

**25. How often were meetings held which included ALL employees but NOT volunteers?**

#	Answer		Response	%
1	Daily		2	8%
2	Weekly		4	16%
3	Monthly		4	16%
4	Annually		14	56%
5	Once Every 2+ Years		1	4%
	Total		25	100%

Statistic	Value
Mean	3.32
Variance	1.14
Standard Deviation	1.07
Total Responses	25

### 26. How often were meetings held which included ONLY senior employees?

#	Answer		Response	%
1	Daily		2	7%
2	Weekly		4	14%
3	Monthly		8	29%
4	Annually		12	43%
5	Once Every 2+ Years		2	7%
	Total		28	100%

Statistic	Value
Mean	3.29
Variance	1.10
Standard Deviation	1.05
Total Responses	28

### 27. How often were staff meetings held which included ONLY junior employees?

#	Answer		Response	%
1	Daily		0	0%
2	Weekly		3	18%
3	Monthly		5	29%
4	Annually		5	29%
5	Once Every 2+ Years		4	24%
	Total		17	100%

Statistic	Value
Mean	3.59
Variance	1.13
Standard Deviation	1.06
Total Responses	17

**28. How often were evaluations held for individual employees? “Evaluations” may be formal or informal personal meetings at which employee performance may be assessed and discussed, with another employee acting in a direct or indirect supervisory, administrative, or managerial role.**

#	Answer	Response	%
1	Weekly	0	0%
2	Monthly	2	6%
3	Annually	20	65%
4	Once Every 2+ Years	1	3%
5	Never	8	26%
	Total	31	100%

Statistic	Value
Mean	3.48
Variance	0.92
Standard Deviation	0.96
Total Responses	31

**29. How often were evaluations held for teams or groups of employees?**

#	Answer	Response	%
1	Weekly	0	0%
2	Monthly	2	6%
3	Annually	9	29%
4	Once Every 2+ Years	1	3%
5	Never	19	61%
	Total	31	100%

Statistic	Value
Mean	4.19
Variance	1.16
Standard Deviation	1.08
Total Responses	31

**30. How often did internal evaluations of the entire reintroduction project take place? “Internal evaluations” may be formal or informal meetings, papers, or presentations which assess and discuss the progress, success, or performance of the reintroduction relative to its stated goals or targets. These evaluations must have been conducted by entities or individuals who were also employees or volunteers with the reintroduction project.**

#	Answer	Response	%
1	Weekly	1	3%
2	Monthly	4	13%
3	Annually	23	72%
4	Once Every 2+ Years	3	9%
5	Never	1	3%
	Total	32	100%

Statistic	Value
Mean	2.97
Variance	0.48
Standard Deviation	0.69
Total Responses	32

**31. How often did external evaluations of the entire reintroduction project take place? “External evaluations” may be formal or informal meetings, papers, or presentations which assess and discuss the progress, success, or performance of the reintroduction relative to its stated goals or targets. These evaluations must have been conducted by entities or individuals who were NOT employees or volunteers with the reintroduction project.**

#	Answer	Response	%
1	Weekly	1	3%
2	Monthly	1	3%
3	Annually	12	41%
4	Once Every 2+ Years	8	28%
5	Never	7	24%
	Total	29	100%

Statistic	Value
Mean	3.66
Variance	1.02
Standard Deviation	1.01
Total Responses	29

**32. Did your project have staff dedicated exclusively to managing public relations and/or media affairs for the reintroduction?**

#	Answer	Response	%
1	No dedicated staff	23	68%
2	1 person	6	18%
3	2 - 3 people	4	12%
4	4 - 5 people	0	0%
5	6+ people	1	3%
	Total	34	100%

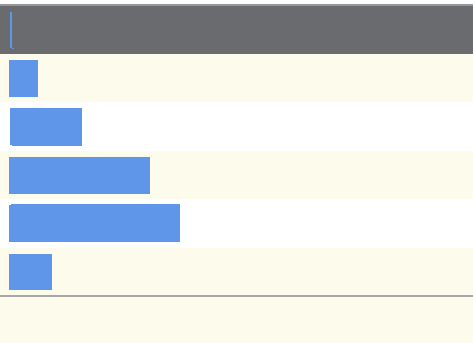
Statistic	Value
Mean	1.53
Variance	0.86
Standard Deviation	0.93
Total Responses	34

**33. Did your project have staff dedicated exclusively to managing public outreach and/or education for the reintroduction?**

#	Answer	Response	%
1	No dedicated staff	22	65%
2	1 person	7	21%
3	2 - 3 people	4	12%
4	4 - 5 people	1	3%
5	6+ people	0	0%
	Total	34	100%

Statistic	Value
Mean	1.53
Variance	0.68
Standard Deviation	0.83
Total Responses	34

**34. Approximately how often did your reintroduction project share information about the focal species or the project itself with the public and/or media? This may refer to press releases, newsletters, announcements via email, blog, or website updates, media coverage in the form of television projects, newspaper or internet articles, or billboards, fliers and posters.**

#	Answer		Response	%
1	Daily		2	6%
2	Weekly		5	16%
3	Monthly		10	31%
4	Annually		12	38%
5	Once Every 2+ Years		3	9%
	Total		32	100%

Statistic	Value
Mean	3.28
Variance	1.11
Standard Deviation	1.05
Total Responses	32

**35. Did your project partner with any of the following types of media organizations to share information about the reintroduction project? A “partnership” may be defined as an ongoing, mutually recognized, formal or informal association between the reintroduction and one or more separate print media groups or organizations.**

#	Question	none	1 - 2	3 - 4	5 - 6	7+	Responses	Mean
1	Newspapers, magazines, or other forms of print media	9	13	8	0	2	32	2.16
2	Television/radio stations or other forms of audiovisual media	13	12	6	0	0	31	1.77
3	Websites, blogs, or other forms of internet media	13	13	5	0	1	32	1.84

Statistic	Newspapers, magazines, or other forms of print media	Television/radio stations or other forms of audiovisual media	Websites, blogs, or other forms of internet media
Mean	2.16	1.77	1.84
Variance	1.10	0.58	0.85
Standard Deviation	1.05	0.76	0.92
Total Responses	32	31	32

**36. Did your project partner with any of the following types of educational organizations to share information about the reintroduction project?**

#	Question	none	1 - 2	3 - 4	5 - 6	7+	Responses	Mean
1	Primary Schools	13	6	3	0	8	30	2.47
2	Secondary Schools	14	5	5	2	5	31	2.32
3	Colleges/Universities	10	12	3	3	2	30	2.17

Statistic	Primary Schools	Secondary Schools	Colleges/Universities
Mean	2.47	2.32	2.17
Variance	2.81	2.29	1.45
Standard Deviation	1.68	1.51	1.21
Total Responses	30	31	30



**37. Did your project partner with any of the following types of non-governmental organizations to share information about the reintroduction project?**

#	Question	none	1 - 2	3 - 4	5 - 6	7+	Responses	Mean
1	International Wildlife or Conservation Organizations	11	13	6	0	1	31	1.94
2	National Wildlife or Conservation Organizations	7	14	9	1	1	32	2.22
3	Regional, Local, or Community Organizations (i.e. community improvement groups)	7	10	7	3	4	31	2.58
4	Naturalist or Local Wildlife Enthusiast Organizations	11	11	4	3	3	32	2.25

Statistic	International Wildlife or Conservation Organizations	National Wildlife or Conservation Organizations	Regional, Local, or Community Organizations (i.e. community improvement groups)	Naturalist or Local Wildlife Enthusiast Organizations
Mean	1.94	2.22	2.58	2.25
Variance	0.86	0.89	1.72	1.68
Standard Deviation	0.93	0.94	1.31	1.30
Total Responses	31	32	31	32

**38. Did your project partner with any corporations or businesses?**

#	Answer	Response	%
1	none	18	56%
2	1 - 2	8	25%
3	3 - 4	4	13%
4	5 - 6	1	3%
5	7+	1	3%
	Total	32	100%

Statistic	Value
Mean	1.72
Variance	1.05
Standard Deviation	1.02
Total Responses	32

### 39. Did your project partner with any other reintroduction projects?

#	Answer	Response	%
1	none	18	55%
2	1 - 2	10	30%
3	3 - 4	3	9%
4	5 - 6	1	3%
5	7+	1	3%
	Total	33	100%

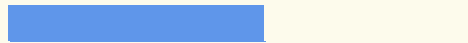


Statistic	Value
Mean	1.70
Variance	0.97
Standard Deviation	0.98
Total Responses	33

### 40. Did your project participate in any festivals, fairs, bazaars, or other forms of public leisure events to share information about the reintroduction project? "Participation" in an event refers to the scheduled appearance of a project representative, the presentation of a performance or speech, the maintenance of a booth or information table, or the active presentation of information for the recruitment of volunteers.

#	Answer	Response	%
1	Never	13	39%
2	Rarely	4	12%
3	Occasionally	11	33%
4	Frequently	4	12%
5	Regularly	1	3%
	Total	33	100%



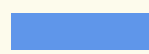
Statistic	Value
Mean	2.27
Variance	1.45
Standard Deviation	1.21
Total Responses	33

#### 41. Do you feel that your project has been a success?

#	Answer		Response	%
1	Yes		20	57%
2	Maybe/Project Is Ongoing		15	43%
3	No		0	0%
	Total		35	100%

Statistic	Value
Mean	1.43
Variance	0.25
Standard Deviation	0.50
Total Responses	35

#### 42. Has a formal evaluation determined your reintroduction to be successful?

#	Answer		Response	%
1	Yes		22	63%
2	No		2	6%
3	Not Applicable/Not Yet Evaluated		11	31%
	Total		35	100%

Statistic	Value
Mean	1.69
Variance	0.87
Standard Deviation	0.93
Total Responses	35

#### 43. Do you feel that your reintroduction has made good progress?

#	Answer		Response	%
1	Yes		26	74%
2	Maybe/Project Is Ongoing		8	23%
3	No		1	3%
	Total		35	100%

Statistic	Value
Mean	1.29
Variance	0.27
Standard Deviation	0.52
Total Responses	35

#### 44. Has a formal evaluation determined your reintroduction to be making/have made good progress?

#	Answer		Response	%
1	Yes		21	60%
2	No		5	14%
3	Not Applicable/Not Yet Evaluated		9	26%
	Total		35	100%

Statistic	Value
Mean	1.66
Variance	0.76
Standard Deviation	0.87
Total Responses	35

**45. Do you plan to continue working with this reintroduction in the future?**

#	Answer		Response	%
1	Yes		24	71%
2	Maybe		9	26%
3	No		1	3%
	Total		34	100%

Statistic	Value
Mean	1.32
Variance	0.29
Standard Deviation	0.53
Total Responses	34

## VITA

Alexandra E. Sutton received her Bachelor of Science degree in biology from Howard University in 2007. During her time at Howard University, she was active as secretary of the Environmental Society, and as a member of the Ecological Society of America's SEEDS program. She was awarded an NSF Undergraduate Environmental Biology Scholarship, as well as an ESA Travel Fellowship. She entered the Wildlife and Fisheries program at Texas A&M University in September 2007, where she was awarded a Diversity Fellowship and L.T. Jordan Institute for International Awareness Research Fellowship. She received her Master of Science degree in August 2009. Her research interests include reintroduction biology and conservation practices.

Ms. Sutton may be reached through the Department of Wildlife & Fisheries Sciences, 210 Nagle Hall, Texas A&M University, College Station, TX 77843-5777 or by email: [lexasutton@gmail.com](mailto:lexasutton@gmail.com).