Internship Proposal

Department of Sociology
Northern Arizona University

Ecological Restoration Institute
Northern Arizona University

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Research Emphasis

Introduction

This proposal outlines my internship position at the Ecological Restoration Institute (ERI) at Northern Arizona University (NAU). The internship proposal contains ERI's background, history, vision, mission, and core values. In addition, the strategic direction and current goals of ERI are discussed in the context of the internship position.

The nature of the internship will not only involve ERI, but also will include a joint effort with the Greater Flagstaff Forest Partnership (GFFP). Due to collaborative efforts between ERI and GFFP, the background and goals of GFFP are discussed as well as how the two organizations interface. Finally, the proposal will discuss the focus of the internship work that will entail ecological restoration monitoring standardization and implementation as it relates to a comprehensive adaptive management process.

Ecological Restoration Institute

The Need for Ecological Restoration

In the Southwestern ecosystem, frequent low-intensity fire is an effective catalyst to promote decomposition, regeneration, diversification of species, and, most importantly in this region, fire acts an inhibitor of intense stand-replacing conflagrations. The Southwestern ponderosa pine forest adapted to frequent, low-intensity fires that decreased combustible fuels. Fire, as an integral part of this ecosystem, has formed an ecological symbiosis, whereas biota has adapted to frequent fire occurrence. In essence, this symbiosis had inoculated the forest by fighting fire with fire.

Euro-American settlers described the area as "…open, devoid of undergrowth, and consisted in the main of mature trees, with practically no forest cover. " It was "…not an uncommon thing for early settlers to cut native hay in the pine forest…" (cited in Pyne 1982:523). In order to maintain the natural fire regimes of the Southwest, frequent, low-intensity fires occurred through lightening ignitions as well as probable anthropogenic ignitions of the Natives living in the forest, mimicking natural fire regimes.

Considering present day conditions, the greatest impact on the fire regimes in the Southwest have been mitigated by the suppression of frequent fire rather than its ignition. This began with Euro-American settlement that brought forth the introduction of grazing animals, high-grade logging of old growth seed trees and, beginning in the early 1900's, a paradigm shift toward complete fire suppression (Pyne 1982). Keeping the grasses in check, cyclically reproducing, would not allow the invasion of woody shrubs and an overgrowth of trees. This, in effect, protected the forests and its inhabitants, as most fires would remain tame, burning only the fuels on the forest floor. The overgrazing of grasses introduced the invasion of woody shrubs and trees that choked the historic surface fire regime of the area. Removal of old growth trees eliminated the seed source for the next generation of saplings. The abrupt evolution of the ponderosa pine ecosystem, along with fire suppression created an unhealthy forest, to the extent that carrying capacity changed from an average of 20-60 trees per acre to hundreds and sometimes reaching in the thousands of trees per acre (ERI website, see references). The successive nature of the forest created not only an unhealthy forest, but also an ecosystem that threatened communities that are surrounded by the largest continuous ponderosa pine forest in the world.

ERI History

In considering the historical context of the evolution of the Southwestern forests and the current state of this specific ecosystems' health, that includes unsustainable flora composition and structure, extended drought conditions that has lead to an extensive bark beetle epidemic and the threat of intense conflagrations to communities, the inception of the interdisciplinary science of ecological restoration was conceptualized and implemented by Dr. Wallace Covington, a forestry professor at NAU (ERI website, see references).

Considering previous years of research experimentation in the ponderosa pine forest, in 1996, a conclusion was drawn that fire alone could not restore the forest to a position of sustainable health (ERI website, see references). This nationally recognized assertion, coupled with the ongoing drought and subsequent damaging and threatening fire seasons

was the driving force of the inception of the Ecological Restoration Program, initially established in the School of Forestry at NAU. The main focus was to design, implement and monitor ecological restoration prescriptions across the Southwest. By the year 2000, the work that began within the School of Forestry was recognized, valued and funded by the Bureau of Land Management, creating the Ecological Restoration Institute, an independent research entity at NAU (ERI website, see references).

ERI Background

The Ecological Restoration Institutes' main focus is to promote ecological health and integrity by returning the forest structure and density composition to those similar to pre-European conditions; while at the same time, involving community members with a common goal of sustainable use of the forests that surrounds them. The university setting allows ERI to draw from a diverse array of academic departments that includes professors and students from across disciplines. The staff at ERI includes more than thirty employees focusing the work in three primary areas that encompass research, outreach and education (ERI website, see references). The scope of this work draws on both ecological and socio-political issues. Not only does this involve research, but also dissemination of information is paramount to the success of ERI.

ERI Vision

The vision of the Ecological Restoration Institute, as an independent research entity, is to position the organization as a nationally recognized leader for research and education in the ecological restoration field. In accomplishing this, ERI envisions its formulation as a collaborative effort so that planning, implementing, and monitoring of restoration treatments are maintained across the Interior West.

ERI Mission

The mission of the Ecological Restoration Institute is to provide land managers, academics and community members with education, applied biological and social science principles, adaptive management applications, and a variety of services that synthesize restoration principles.

ERI Core Values

The main focus of the Ecological Restoration Institute is to establish and share a healthy and sustainable ecosystem for generations to come. In order to accomplish this, established management practices are combined with groundbreaking innovations culminating into future progressions within the interdisciplinary arena of ecological restoration. ERI envisions the role of humans as an integral part of the ecosystem, not separate, but coevolving and dedicated to the ecosystem in which they live.

ERI's work will contain the utmost integrity through scientific inquiry and strategic, applied methodologies. This is inclusive of adaptive management principles, applying what is learned to future endeavors. ERI is committed to respecting and encouraging input from an array of stakeholders. Additionally, the organization is dedicated to maintaining a supportive environment for its diverse interdisciplinary team.

ERI 2005 Strategic Direction in Relation to the Internship

The Ecological Restoration Institutes' primary initiatives are based on assessed priorities of primary stakeholders so that a strategic plan is developed and implemented in order to effectively reduce hazardous fuels within a scientifically based ecological restorative framework (ERI website, see references).

In order to accomplish this, ERI has outlined its current strengths, weaknesses, opportunities and challenges within a strategic plan. In beginning an internship position at ERI, several key points from each of the four categories will be addressed in the context of the internship position.

Among the strengths outlined in the strategic plan, ERI believes it can address national concerns and scientific achievements in monitoring and how it relates to adaptive management (ERI website, see references). In relation to this strength, a main focus of this internship is to promote, implement and adjust monitoring techniques so that lessons learned are applied to future restoration projects. With the information obtained, ERI has the capacity and strength to apply and disseminate what is learned on a local level to a

larger landscape scale level with similar ecological attributes across the Southwest. The recommended applications and information can be disseminated to a national network so that restoration treatments can be applied within a timely manner and performed within a scientifically sound framework.

In touching upon ERI's perceived weaknesses, two areas will be addressed in relation to this internship. First, through the internship position, ERI will enhance its perceived weakness of insufficient staff for the provision of social science research. The addition of my internship position as a graduate student in applied sociology with a research emphasis as well as the first hand experience that I've gained working at the Social Research Laboratory, should aid in expanding the personnel with a social science perspective. In addition, in discerning ERI's perceived weakness for improved coordination and collaboration, the interface of ERI with the GFFP Monitoring and research Team (MRT) for monitoring standardization and implementation should improve collaboration and coordination between the two organizations.

In conceptualizing opportunities and challenges of the ERI strategic plan, two issues can be addressed by the internship position. First, multi-party monitoring is encouraged and recognized on a national level (ERI website, see references). Due to the nature of the internship, its progress and advancement is a core component. Secondly, in order to address the fusion of long-term research needs with short-term management needs, a challenge noted by ERI, monitoring and its adaptation is a possible link to this perceived gap in the ecological restoration process.

Greater Flagstaff Forest Partnership

GFFP Background

The Greater Flagstaff Forest Partnership Inc., a non-profit organization, contains a membership of 27 groups or organizations representing academic, business and governmental organizations as well as environmental groups in Flagstaff, Arizona (GFFP website, see references). The partnership was formed in order to address the concerns of

restoring environmental integrity and forest health, while at the same time decreasing the likelihood of catastrophic wildfires in and around Flagstaff's Wildland Urban Interface (WUI), where community boundaries merge with a vast forested landscape.

The WUI, in and around Flagstaff, consist of approximately 180,000 acres of forested area (GFFP website, see references). This area consists of federal, state, city and private lands, with the bulk of the area consisting of Forest Service lands. The formal partnership is between the GFFP and the United States Forest Service (USFS) (GFFP website, see references). This agreement renders the USFS in full capacity to make and adjust management decisions of the USFS designated lands.

GFFP Goals

The Greater Flagstaff Forest Partnership has three primary goals that engine the organization. As with the Ecological Restoration Institutes' mission and goals, the GFFP's mission is to restore ecosystem health towards a range of natural variability of flora and fauna in the ponderosa pine forest, with an emphasis on the WUI of Flagstaff (GFFP website, see references). The second main objective is to keep in check the accumulated forest fuel loads so that the risk of stand replacing wildfires is minimized and communities are protected. Lastly, GFFP was formed to research, develop and apply various key components of ecological, social and economic issues as they apply to restoration activities.

GFFP Organization

The Greater Flagstaff Forest Partnership organizational structure consists of four key groupings. These include a Board of Directors, a Partnership Staff, a Partnership Advisory Board (PAB) and four working groups (GFFP website, see references). The four working groups oversee planning and projects that consists of a Project Team, Utilization Team, Public Information/Involvement Team and a Monitoring and Research Team.

Greater Flagstaff Forest Partnership Monitoring and Research Team

Since its inception (July 2004), I have been involved as a member of the reestablished GFFP Monitoring and Research Team. The GFFP MRT has worked within a collaborative capacity to compose a monitoring framework with an underlying goal of applying the monitoring results to an adaptive management process.

The Greater Flagstaff Forest Partnership Monitoring and Research Team consists of highly skilled and trained members from an array of ecological, social, economic and political backgrounds. The team was formed in order to develop an *Adaptive Management Monitoring Framework* that addresses five broad areas, reflecting the monitoring needs of the Partnership (see Appendix A). The monitoring framework focuses on fuels reduction, ecosystem restoration, social issues, economic health and institutional health.

The framework was developed as a resource so that any project team can draw from and customize monitoring objectives and priorities to a particular site. This will be based on the specific project objectives, the site characteristics, future desired conditions and how these conditions will be achieved (ERI website, see references). Within these processes, both social and economic issues will be brought into the planning and decision-making process. In an ideal world, completing an array of monitoring objectives would be the target, but due to limitations of funding and resources, monitoring parameters must be scaled down to encompass objectives based on site specific priorities.

The GFFP MRT *Adaptive Management Monitoring Framework* is viewed as a work in progress. As monitoring practices are implemented, the framework is subject to modification, based on the lessons learned.

Monitoring

The need to monitor ecological restoration projects is paramount to the future progression of ecological restoration. Monitoring completes the information loop with feedback on whether objectives have been met. This information can be used to verify "best management practices," and improve or modify less successful prescriptions. The most effective monitoring of ecological, socioeconomic and sociopolitical issues will include a longitudinal methodology so that trends are assessed over time. Relative to other land management activities, monitoring issues that need to be addressed within ecological restoration projects are broader and should encompass issues that affect the widest variety of stakeholders (ERI website, see references). This implies an interdisciplinary genre so that the monitoring priorities encompass not only ecological factors, but also social, political and economic issues.

Adaptive Management

In order to effectively utilize the findings of the monitoring process, results from monitoring are fed back into the planning process so that design and implementation of future projects is continuously improved. This adaptive management process feeds information learned from ongoing and completed projects into upcoming project planning and implementation. This requires an adaptive model so that each project has the flexibility to implement changes when faced with a multitude of uncertainties.

The basic adaptive management process involves six steps that include: assess, design, implement, monitor, evaluate, and adjust (ERI website, see references). The information gained from this process, completes the loop by utilizing lessons learned to future planning and implementation of projects. With this in mind, monitoring is an essential component to the adaptive management process.

Internship Goals - Monitoring Implementation and Standardization

With the guidance of the Ecological Restoration Institute's staff and the Greater Flagstaff Forest Partnership Research and Monitoring Team, the focus of this internship is to implement the MRT *Adaptive Management Monitoring Framework* to ongoing and future GFFP projects. The objectives will target both implementation and standardization of the monitoring process. As this process is refined, ecological, social, political and economic monitoring objectives will be included in the process.

In order to accomplish this, previous research findings, indicators that are already being measured by various land management agencies and project specific objectives will be taken into consideration. Initially, this could be accomplished with one or more pilot studies on sites with ongoing projects. Results of the pilot studies could inform a more comprehensive plan for future monitoring projects. Due to the implications of adaptive management practices, a challenge faced with the monitoring process is the ability to collect and analyze the data so that the findings are reported in a timely manner, so that "lessons learned" are efficiently and effectively applied.

In viewing a multi-party monitoring process as a collaborative effort, many of the collective goals of both the ERI and the GFFP will be achieved through streamlining communication efforts so that the work conducted by the MRT is both transparent and interactive, promoting a productive platform that will continue into the future. This will involve a multitude of stakeholders as well as a commitment to the involvement and participation of the citizens of the Flagstaff community.

Internship Paper and Sociological Perspective

In order to conceptualize the internship experience within a sociological framework, the *ecological complex model*, commonly referred to as the POET model, will lay the foundation for its synthesis (Mahmoudi and Parlin 2005). The POET model includes an intricate intermingling of macro-structures that include population, organization,

environment and technology (Mahmoudi and Parlin 2005). The POET model's interdependent macro-structures evolve through time and induce inevitable social change. As society evolves amidst these structures, the natural environment is either valued or misused, adding to societal evolution, for better or for worse.

The need for ecological restoration, restoring weakened forest ecosystems to a desired historical, natural, thriving state can be synthesized within the POET model. Within this framework, both the historic path to forest depletion and the future hope of forest renewal can be conceptualized.

In assessing the interaction of population, organization, environment and technology and its affects on the natural environment, numerous theoretical explanations can be assimilated to historical events through present time. Assimilating both positive and negative historical processes as well as how the macro-structures can be manipulated for future progressions is a crucial component towards gaining social, political and environmental equilibrium.

As the internship progresses, the details of the specific project will unfold coupled with the appropriate applied sociological emphasis.

Committee Members and ERI Staff Advisor Background and Interest

Committee Chair
Dr. Kooros Mahmoudi,
Ph.D., *Professor, Sociology Department*
(B.S., M.S., Ph.D, Utah State University 1973)
Began at NAU in 1981
Research interests:
Demography, urban, social organization, sociological theory, population and environment

Committee Members
Dr. W. Wallace Covington
Ph.D., *Regents' Professor Forestry Department;*
Director of the Ecological Restoration Institute
(B.A., University of North Texas, 1969; M.S., University of New Mexico, 1972; Ph.D., Yale University, 1976
Research interest:
Ecological Restoration

Dr. Janine Minkler,
Ph.D., *Assistant Professor, Sociology Department*
(B.A., Brandeis University; M.A., PhD Boston College)
Began at NAU in1998
Research interests:
Environment, cultural studies, social anthropology, social movements and political sociology

ERI Advisor
Diane Vosick,
M.A., *Associate Director of the Ecological Restoration Institute*
(M.A., University of Minnesota, Geography; Minor Public Affairs. 1988
B.A., The Evergreen State College, Liberal Arts. 1977)
Research interests:
Linking the needs of the public to research and services of the ERI

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