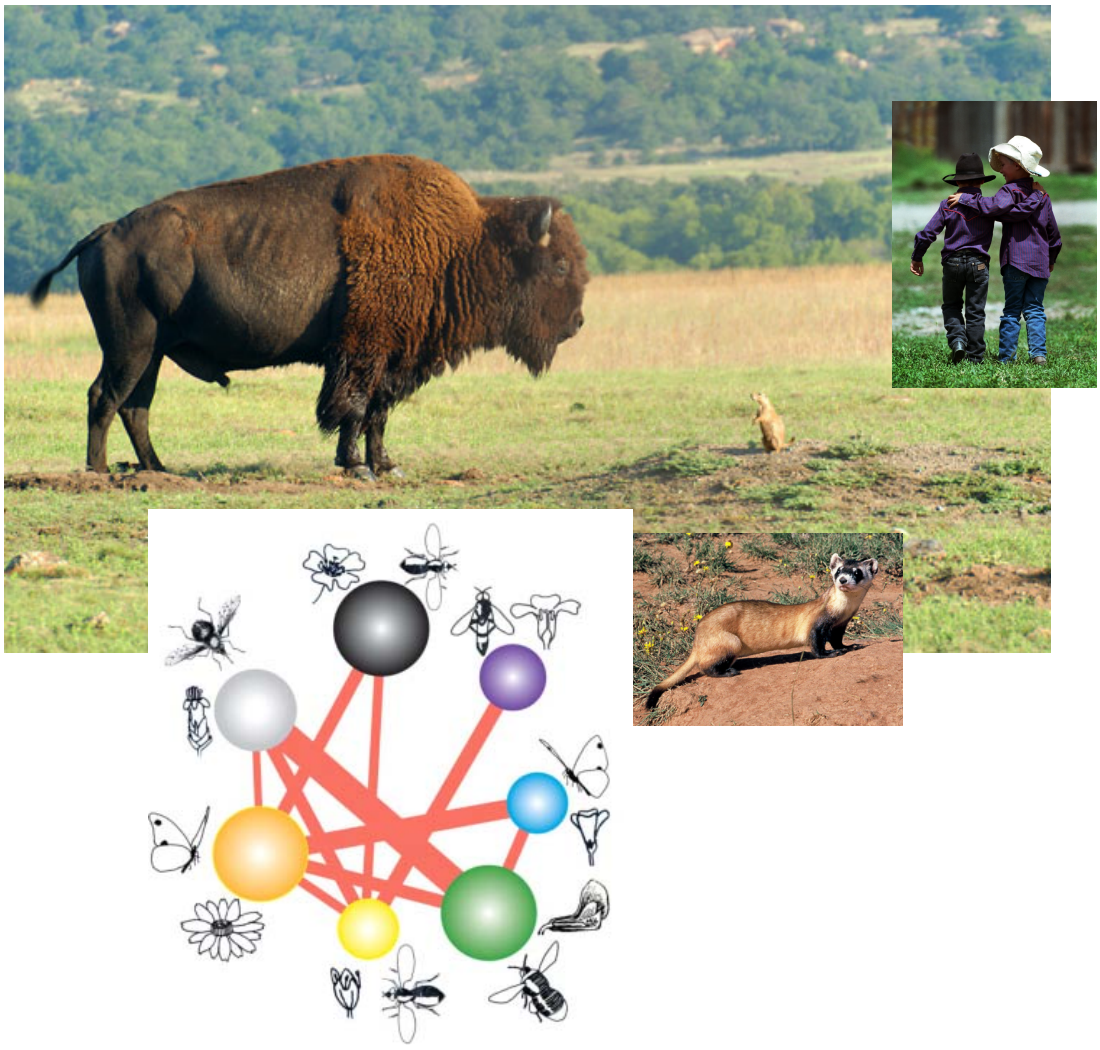

A Biodiversity Science Institute for the University of Wyoming

A Biodiversity Science Institute for the University of Wyoming: Possible Institutional Organizational Relationships for the University of Wyoming's Biodiversity Initiative.

Report of the Provost's Task Force

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Executive Summary

This proposal identifies how the Biodiversity Science Institute could fit into the academic landscape of this University and what might be the first steps in creating the program. We evaluated different placements of where BSI could fit into UW's organizational structure and the benefits and costs of each location. The model developed in the President's Task Force on Biodiversity report and in this report tries to create an initiative across campus that is transformative and touches upon multiple disciplines without supplanting missions in other programs. It adds educational opportunities for students and the public, as well as fellow scientists and scholars.

We also propose the first actions of this initiative in hiring the director and three program leaders. It is imperative to get the Director hired and start the planning process to build the faculty and funding to make the initiative operational. The Director and the proposed positions will create a presence on campus and interest among the general public to aid in its growth.

Introduction

The report of the President's Task Force on Biodiversity gives an expansive vision for a biodiversity initiative at the University of Wyoming. It provides an encompassing perspective for an initiative that can transform our institution by coordinating its strengths in biodiversity science and conservation and by expanding the influence of this theme across the university. Our university not only needs and deserves this initiative, but through it has the potential of becoming a world leader in biodiversity science and conservation. Institutions develop a bit like organisms: by the interaction of design, opportunity, and adaptation. The President's Task Force on Biodiversity provided broad guidelines for the design of a biodiversity initiative at UW. Provost Myron Allen and Vice President Carol Frost assigned the present group the task of identifying initial steps for the rapid implementation of this initiative and for positioning it within the structure of the university. In particular, he asked us to identify possible organizational positionings that would enable the biodiversity initiative to link with other academic units within UW. This is necessary because there are a large number of these units on campus with missions that overlap with that of the biodiversity initiative. The second task was to identify steps to launch the biodiversity initiative, which we will call the Biodiversity Science Institute (BSI) in this document.

This report is organized in 3 sections: In the first section (Background), we cite portions of Report from the President's Task Force on Biodiversity relevant to the present committee's tasks. The next section (The Biodiversity Science Institute as a Pivotal Component of the University of Wyoming) describes possible organizational relationships of the BSI with other units at UW pursuing related academic missions and evaluates their merits and shortcomings. This section begins with a detailed description of the criteria we used to evaluate alternatives. Subsequent sub-sections suggest characteristics for the internal structure of the BSI and a description and evaluation of possible organizational structures. In particular, we focus on the relationship of the BSI with the Environment and Natural Resources (ENR) program. ENR is the institution with which the BSI has the potential of overlapping the most, and hence the institution that it must develop a close partnership with. We also discuss the relationship with other units on campus that have biodiversity as a component of their mission. The report finishes with a set of proposed short-term actions (Proposed Short-term Actions), which if taken, will foster the rapid development of the BSI.

Background

Vision Statement and Organizational Components of the BSI (from the Report of the President's Task Force on Biodiversity)

To set the stage for this report, it is important to recall the visionary goal which the first Task Force report laid out for the Biodiversity Science Institute.

> The University of Wyoming's Biodiversity Initiative will promote research, education, and outreach concerning the study of biodiversity broadly construed. This study includes

both the science of biological diversity and the analysis of the interplay between society and the biological variety of the natural world. It will foster the conservation of biodiversity by promoting understanding of the physical, biological, and human forces that impact and shape its character.

The initiative's immediate focus will be Wyoming and the Rocky Mountain region, but its endeavors will be informed by and contribute to scholarship globally. The primary goal of the Initiative will be to foster scholarship concerning biodiversity and the ways in which humans interact with it. Building upon that knowledge, the Initiative aims to engage students and the public in dialogue about biodiversity, human attitudes towards it, and its impact upon human well-being. Through the development, articulation, and application of cutting-edge biodiversity knowledge, the Initiative seeks to promote understanding and appreciation of the living world and its conservation for faculty, students and the public at large. It also aims to provide sound, independent and objective, broad-based information on biodiversity management to government agencies, non-governmental organizations, the private sector, and the public at large.[1]

Scholars have characterized the tripartite mission of a land grant university as teaching[2]: Teach to students in the classroom, teaching to the public and policy makers in outreach, and teaching to peers through research. Likewise the BCI's mission is to teach biodiversity at all three levels: Instruction, Outreach, and Research. To accomplish this goal, the President's Task Force identified four elements that will make up the Institute.

The elements of the Wyoming Biodiversity Initiative will include…

I**. Research.** The Biodiversity Initiative will advance understanding of biodiversity through a statewide program of inventory, monitoring and assessment. Through targeted research funding the Initiative will provide novel solutions to some of the most difficult challenges facing human society. It will develop ideas and applications, often using Wyoming as a test-bed, which can be applied and adopted in the state and in other parts of the nation and the world.

II. Education. An interdisciplinary group of faculty will develop and offer programs — beginning with a bachelor's degree — in Biodiversity Studies, a field that combines the study of biodiversity science with the study of human interaction with biological diversity. The initiative will support student research, field experiences, and internships.

III. Outreach. The Wyoming Biodiversity Initiative recognizes the central role citizens and decision-makers play in conservation of biological diversity. Initial projects involving partnerships across UW and dialogue with citizens and stakeholders will include a Wyoming Atlas of Natural History and website, a Wyoming Biodiversity Science electronic clearinghouse, a Citizen Science program, and other programs that provide extension and outreach in biodiversity conservation and continuing-education

[1] *The Report of the President's Task Force on Biodiversity*, p. 5.
[2] Beattie, B. R. and M. J. Watts. 1987. The proper preeminent role of parent disciplines and learned societies in setting the agenda at land grant universities. *Western Journal of Agricultural Economics* 12(December): 95-103.

opportunities for land managers and other professionals.

IV. Administration. The Wyoming Biodiversity Initiative will be administered by leading scholars in the field who will serve as director and associate directors. This leadership team will coordinate an interdisciplinary group of dedicated and affiliated faculty, and will oversee academic professionals, post-doctoral scholars and staff.[2]

The Biodiversity Science Institute as a Pivotal Component of the University of Wyoming

Evaluation Guidelines and Criteria

Our evaluation of alternative administrative structures reflects our belief in the importance of the Biodiversity Science Institute (BSI) as a transformative force within the university and state. The University of Wyoming is already recognized internationally in ecology, natural resources, and other aspects of biodiversity research. However, with few exceptions, our expertise and efforts are scattered across the institution and remain uncoordinated. The birth of a new Biodiversity Science Institute provides an impetus to consolidate and coordinate the multiple groups that are currently working in research, outreach, and education closely related to biological diversity at the university. Below, we enumerate the three key criteria for our evaluation of administrative structures: Coordination, Inclusiveness, and Support.

1) Coordination. We view organizations that increase coordination among existing initiatives as positive. Coordination reduces competition among units, while increasing the challenge for each unit to maintain a distinctive "brand" and identity within the university for students and other faculty and donors who have invested in them. We viewed positively structures that foster coordinated action and reduce redundancy, and therefore increase cost effectiveness.

Accomplishing the above coordination does not require rigid hierarchical structures. We believe that the BSI presents an opportunity for consolidating expertise and action as it creates symbiotic partnerships based on flexible relationships. The elements in the structures that we favor collaborate with each other but have considerable autonomy—e.g., they can have their own advisory boards. Also, ideally, their governance will be undertaken by participating faculty.

Along with the emphasis on adding value to existing campus organizations by increasing communication and coordination, the chosen organizational structure should facilitate the development of novel and exciting initiatives. We predict that many of these initiatives will originate from the cross fertilization among the scientific disciplines that are at the core of biodiversity science, with practitioners of social science, the arts and the humanities.

2) Inclusiveness. We ranked more highly those structurs that foster the broad inclusion of all disciplines within the university.

[2] *The Report of the President's Task Force on Biodiversity*, p. 4.

We recognize that the BSI will not achieve its ambitious goals without robust support. This support should not come at the expense of existing successful organizations at UW.

3) Support. We value more highly structures that do not hamper the activities of these initiatives and that do not jeopardize their current and future support.

We did not shy in our cost-benefit analysis from analyzing perceived (and real) perceptions of donors. We favored organizational structures that, in our opinion, will be viewed favorably by donors, trustees, and the legislature.

Internal Structure of the BSI

Some features of BSI's internal organization clearly must depend on its relationship with other existing UW organizations. However, we believe that BSI must have several features that are relatively independent from other organizations in campus. These features are a director, an independent advisory board comprised of individuals not affiliated directly with UW, an internal coordinating committee comprised of individuals affiliated with UW, and staff to carry out BSI's three primary missions: education, outreach, and research.

-BSI's Director. BSI should have a Director who is a biological scientist with a well-recognized scholarly track record, evidence of successful grantsmanship, and a commitment to the broad inclusive mission of the institute.

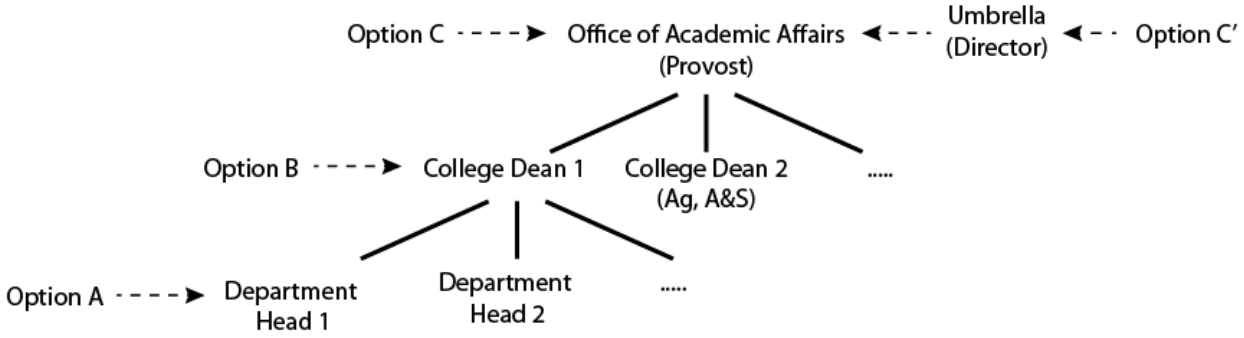
- BSI's Advisory Board. BSI should have a strong board that supports and advises its director. This board should include external academic advisors (we favor the inclusion of scientists of high caliber and experience on biodiversity and its conservation), citizens with interest and expertise in BSI's mission, and members of government agencies and NGOs. The importance of a strong board cannot be overemphasized.

-BSI's Coordinating Committee. As emphasized in following sections, one of the central roles of the BSI is to coordinate the diverse activities of the organizations and faculty in campus with an interest in biodiversity. The BSI Coordinating Committee will include representatives of related departments and organizations—from within the sciences and other disciplinary areas—as well as individual faculty members affiliated with the BSI. It should emphasize science, but include also the arts, the humanities, and the social sciences. The committee's members will have several roles. They will help the director shape BSI's direction, serve as a communication channel between the BSI and other organizations, and to participate in the Institute's activities.

- BSI's Staff. Although it is likely that some of the staff devoted to education, outreach, and research will be shared with partner organizations (for example an assistant director for Outreach might be shared among BSI, the Ruckelshaus Institute, and the Haub School), it is wise for BSI to have at least one staff member devoted to coordinate each of these activities exclusively for BSI.

The Case For a University-Wide BSI

Following the mandate letter from Provost Allen and Vice President Frost, we explored first the question of the university administrative unit to which BSI's director should report, and second the relationship between BSI and related entities on campus. We deal with the first question here and with the second one in two following sections.



As is laid out in Figure 1, BSI could be set up to report at one of several levels. The director of BSI could conceivably report to a department head, such as the chair of Botany, Renewable Natural Resources, or Zoology. This is indicated by Option A in Fig. 1. They could report to a dean, such as that of the colleges of Agriculture or of Arts and Sciences (Option B above). In other words, it could be a department or a department-like entity. Finally, BSI could report to the Provost (Options C and C'). There are two possible options here: BSI could report directly to the Provost by itself or indirectly as a component of a larger "umbrella" organization.

The only alternative that satisfies the criteria of both coordination and inclusiveness is that in which BSI's director reports to Academic Affairs (Options C and C'). Biodiversity is an important aspect of research and teaching in the departments of several colleges. To locate the BSI within one college would therefore place impediments to cooperation from faculty and units in other colleges. The only remaining question, then, is whether the director of BSI should report directly to the Provost or indirectly through the director of a broader organization (such as the director of ENR construed broadly as described in the following section).

Relationship of BSI with ENR: Advantages and Disadvantages

In the introduction, we emphasized the possibility of overlap between BSI and ENR. This section aims to resolve the potential problems caused by this overlap. We first consider whether BSI should be an autonomous entity, and then evaluate the wisdom of having either ENR as a component of BSI or whether BSI should be a component of an ENR initiative with a broader mandate and mission. These alternative organizational structures are best assessed when visualized in a decision tree:

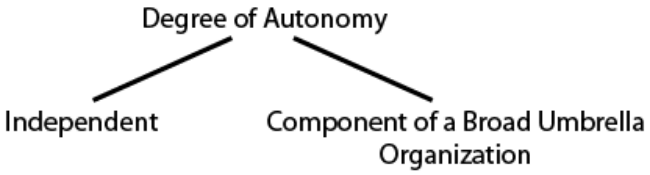


Fig. 2. Should BSI be an independent, completely autonomous, entity in campus, or should it be part of a larger entity?

The first alternative, that of an independent BSI, conflicts with two of our evaluation criteria: coordination and support. A completely independent BSI could lead to reduced coordination and communication with complementary organizations in campus, especially ENR, and potentially conflict with these entities' funding efforts. We strongly support placing BSI as a component of a larger entity that addresses issues not only of biodiversity, but also of the environmental disciplines (including the social sciences and the humanities), and the implications of biodiversity science for natural resource management. The overlap between BSI and ENR (and other entities in campus) is too large to permit their sustainable independent function. In addition, a larger umbrella organization that includes entities that share similar objectives can lead to efficient use of resources and personnel. We propose to place BSI in a larger organization that also includes ENR.

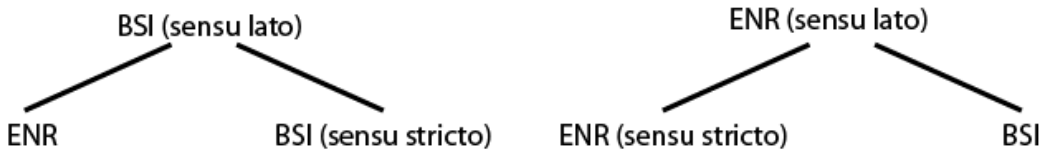


Fig. 3. What should the structure of this larger "umbrella" organization be, and what are the relationships among its components?

The first decision to be made is whether the director of the umbrella organization is that of BSI or ENR. We note that the decision of placing the director of ENR as that of the umbrella organization assumes that BSI will be a new component of ENR. The alternative option, placing the director of BSI as director of the umbrella organization, implies subordinating ENR within BSI. There are both logical and strategic reasons to favor the director of ENR as the director for

the umbrella organization. Logically, ENR's mission is broader than that of BSI. ENR's mission "is to advance the understanding and resolution of complex environmental and natural resources challenges" (http://www.uwyo.edu/enr/index.html). Many of these problems involve biodiversity. The strategic reasons that favor having ENR's director as the director of the umbrella organization include ENR's longer track record in the state and country as well as the potential of using ENR's existing structure to implement BSI's goals in the short term. ENR is a successful organization that has credibility within the state and Nationally, as well as a record of sustained funding and support. BSI is an organization that has not been launched. Placing BSI within ENR has the potential of facilitating the initial steps of this new organization by taking advantage of ENR's expertise in interdisciplinarity within the university, its connections with stakeholders in the state, and the existence of a functioning, effective, and well-staffed organization.

A Matter of Names and Missions

The creation of a large organization that includes BSI as a component of an expanded ENR implies changes to ENR's mission to include BSI's mandate. In addition to "… advancing the understanding and resolution of complex environmental and natural resources challenges" it must include BSI's focus on life's diversity. This expanded mission for ENR will likely require a new name that reflects this broader charge. We suggest the name *Environment, Natural Resources, and Biodiversity Program* (ENRB).

Relationship of BSI with Other Biodiversity Science Entities in Campus (excluding ENR)

One of the primary roles of the BSI should be to help coordinate the activities and functions of all organizations that are involved in biodiversity to enhance cooperation and synergy, reduce unnecessary overlap, and to optimize the use of resources. For example, we envision the BSI's web site as an attractive and user-friendly portal that is used to highlight biodiversity outreach, education, and research at UW, the state, and the region. Everyone interested in biodiversity at UW, and indeed the state and region, should have the BSI's site bookmarked and should consult it often. The size of our institution both demands and allows the coordination in biodiversity science and conservation. The Berry Biodiversity Conservation Center has already started this coordination by advertising seminars and biodiversity-related activities broadly throughout campus. Coordination of biodiversity-related activities, however, must extend beyond this limited function.

The BSI must also become a much needed coordination agent for biodiversity education at UW. Currently, students interested in biodiversity and conservation (and their advisors) have an enormous number of courses to choose from—not to mention a large number of majors and minors (including Agroecology, Botany, Insect Biology, Forest Resources, Zoology, etc.). However, these courses and undergraduate degrees are dispersed throughout a wide number of departments and colleges. The BSI can provide a venue through which information on biodiversity education at UW is gathered, organized, and disseminated. This coordination on biodiversity education should likewise extend to the graduate level.

A large number of departments and semi-autonomous organizations within our university have biodiversity science as a central element in their mission (see Appendix). These organizations have a diversity of internal organization, are components of a wide range of institutions within

UW, and report to a variety of administrative units. For example both the UW-National Park Service Research Center and the Wyoming Natural Diversity Database report to the Office of Research and Academic Development, whereas the Wyoming Reclamation and Restoration Center reports to the College of Agriculture and Natural Resources and is closely affiliated with the School of Energy Resources. In addition to the many organizations that have biodiversity science as their primary focus, faculty interested in biodiversity are scattered among an even larger number of units across campus.

What should the relationship between BSI and all these organizations and faculty be? We envision a structure that permits a variety of options, in which each organization can choose to have a tie ranging from a loose, "associated" link up to becoming part of the BSI's internal reporting structure. This would thus not be a one-size-fits-all situation, but one which reflects the welcoming interdisciplinary approach the task forces intend it to have. Some organizations in campus should establish a close relationship with BSI and report to its director. These partner organizations potentially include (but are not restricted to) those currently housed in the Berry Biodiversity Conservation Center. In addition to organizations that should have a close and direct relationship with BCI are those that currently report to other academic offices in campus, but that have a strong biodiversity component in their mission. These organizations should maintain close ties with the BSI, perhaps by participating in BSI's advisory board. Finally, we envision faculty throughout campus having joint and/or adjunct positions in the BSI—these faculty will act as biodiversity ambassadors across the university. We emphasize that the degree of interaction between BCI and other campus organizations should be evolving and flexible. As interest in biodiversity and its conservation increases across campus, and as the visibility and prominence of the BSI is heightened, the degree of interaction between BSI and many organizations in campus will also grow.

To establish the nature of the relationship between BSI and its potential partner organizations, we propose a broad consultation between the BSI and both faculty and administrators of these organizations. This committee suggests that this broad consultation take place after a director for the BSI has been designated. The inclusion of different initiatives as partners demands consultation, care, and a delicate hand in negotiation with faculty and administrators at all levels. Perhaps more importantly, the task requires time both to inform and to listen. This is a task better left for the BSI's director to coordinate.

Proposed Short-term Actions

We propose three sets of actions that can begin immediately and will foster the rapid development of BSI. These are: (1) a national and international search for a new director, (2) the hiring of three faculty (internally or externally) to new positions within the BSI, and (3) the creation of a funding campaign to garner the resources needed to launch and develop the ambitious goals of the BSI.

(1) The director of the BSI will be responsible for taking the lead in developing and putting into place the three main prongs of the Biodiversity initiative: education, outreach and research. It is

important to have a person in this position quickly so that they can guide the initiative from the earliest stages possible.

> The University should launch as soon as possible a national and international search for a Director of the BSI. The director should have an internationally recognized scientific trajectory, a reputation for accomplishment and thoughtfulness, a passion for biodiversity, evidence of grantsmanship, and a commitment to the broadly inclusive mission of the institute. Successful candidates must articulate a vision for the role that BSI can have as a transformative entity within UW and the state of Wyoming.

(2) The BSI should hire three new positions to move forward the outreach and educational prongs of the BSI's goals. The first position is that of the Outreach Project Coordinator. This should be filled as quickly as possible for it is the position that can most quickly show progress on BSI's goals. The other two positions will belong to the educational program and will be responsible for designing, implementing and teaching in the undergraduate majors and other degrees sponsored by the BSI.

> (2a) **Outreach Project Specialist**
> **Description:** This position will supervise the two high priority Biodiversity Center outreach projects outlined in the previous taskforce report and work with faculty on expanding outreach in general. A national need exists for scientists and scholars who can bridge the gap between biodiversity sciences and public education. This position will require fluency in both in the science and related policies, but also the pedagogy of public education.
>
> **Responsibilities:** The successful candidate will be expected to coordinate the development of the Wyoming Atlas of Natural History and to establish the Citizen Science Program. Both projects will require collaborating with natural and social scientists, education specialists, as well as faculty from Arts and Humanities on campus but also reaching out to community groups in the State.
>
> (2b) **Biodiversity Science Degree Coordinator**
> **Description:** The documentation, genesis, and maintenance of biological diversity is a central ingredient of biodiversity science. We propose searching for a life scientist that uses contemporary approaches to document and research the mechanisms and processes that explain biodiversity patterns in space and/or time. This person must have a demonstrated commitment to education in biodiversity science and an interest in participating in an interdisciplinary initiative that will link his/her research with other disciplines, including the humanities, the arts, and the social sciences.
>
> **Responsibilities:** While the research area of the person filling this position is open, they will take on primary responsibility for designing and implementing the biodiversity science undergraduate major in cooperation with the biodiversity studies coordinator and secondary responsibility for the designing and implementing the biodiversity studies major. Their teaching responsibilities will lie primarily within these degrees.

(2c) **Biodiversity Studies Degree Coordinator**
Description: Humans have long known how to manipulate their environment to increase or decrease biodiversity and hence the sources of food and other "eco-system services." These conscious and planned activities result from political decisions, economic and farming activities, and from attitudes towards human life and living creatures. This variety of activity constitutes an important area of research and teaching for the BSI, its grants and its educational programs and degrees.

Responsibilities: The person in this position will take on primary responsibility for designing and implementing the biodiversity studies undergraduate major in cooperation with the biodiversity science coordinator and secondary responsibility for the designing and implementing the biodiversity science major. Their teaching responsibilities will lie primarily within these degrees. Area of research specialty and teaching abilities are open, but the capacity to teach courses in a more than a single discipline a plus. This position seeks either a social scientist (including economics) or a humanist who has expertise in how their discipline connects with questions concerning biodiversity.

3) At the moment, fund-raising for the BSI is taking place on an ad-hoc basis without any official or strategic organization or planning. A more formal approach to fund-raising needs to be put into place to enhance cooperation between the fledgling BSI and the Foundation. Short-term and long-term goals need to be discussed and decided upon (with the recognition that the incoming director will have an impact on these as well).

Accomplishment of the three prongs of the BSI's goals can all be enhanced through fundraising. The first focuses on resources and personnel to carry out the outreach projects. The second emphasizes faculty and resources (such as student scholarships and travel support) for the degree programs. The third concerns the research prong, which aims to encourage, develop and provide seed money for significant and targeted research projects in biodiversity.

Appendix

Faculty interested in biodiversity and its conservation are scattered widely throughout UW. This list includes only academic organizations that have a significant fraction of their staff dedicated to the study of biodiversity. It names only those institutions that have biodiversity as a direct and integral component of their mission, and that therefore are likely to have a direct partnership role with the BSI. Faculty in a variety of other organizations in campus (including but not restricted to Anthropology, Geography, Philosophy, and the College of Law) have a deep interest in biodiversity and should be included in a broad consultation.

College of Arts and Sciences

- **Botany Department**
  - -Rocky Mountain Herbarium
- **Robert and Carol Berry Biodiversity Conservation Center**
  - -Stable Isotope Facility
  - -Nucleic Acids Exploration Facility
  - - UW Vertebrate Collections
- **Department of Zoology and Physiology**
  - -Wyoming Fisheries and Wildlife Cooperative Study Unit
  - -Red Buttes Research Laboratory
- **Life Sciences Program**

Office of Academic Affairs

- **Environment and Natural Resources Program**
  - -William D. Ruckelshaus Institute of Environment and Natural Resources
  - -Helga and Otto Haub School of Environment and Natural Resources.
- **Program in Ecology**
- **Wyoming Geographic Information Sciences Center (WyGISC)**

Office of Research and Economic Development

- **Wyoming Natural Diversity Database (WyNDD)**
- **University of Wyoming-National Park Service Research Center (AMK Ranch in Grand Teton National Park)**

College of Agriculture and Natural Resources

- **Department of Ecosystem Science and Management**
  - -Wyoming Reclamation and Restoration Center
  - -Insect Museum
- **Department of Agricultural and Applied Economics**
- **Department of Microbiology**
- **Department of Molecular Biology**
- **Department of Plants Sciences**

College of Business

- **Department of Economics and Finance**

Interdisciplinary Graduate Programs

-Program in Ecology
-Biomedical Sciences Program
-Molecular and Life Sciences Program