

Frequently asked questions about the ATBI Alliance.

What is an ATBI ?

ATBI stands for All Taxa Biodiversity Inventory, which is the scientific term for an intense inventory of all species in a defined area, such as a national park or other reserve. It usually involves scientists, citizen volunteers, a lead non-profit group and agency staff at the reserve. Species in all groups are scientifically sampled to maximize data on: 1) species occurrence, 2) relative abundance, 3) distribution in the reserve, and as possible, 4) ecological associations. Science, reserve stewardship and public involvement/education are major goals of ATBI's. The inventory is driven by scientists' involvement.

Does an ATBI really mean a survey of ALL species?

Yes. However, it does not mean all groups are surveyed at the same time. Scientists and agency staff look for logistical sampling efficiencies and taxonomic opportunities across groups, but the commitment is there for all groups. This includes micro-organisms, for which there are now automated genetic analyses to retrieve DNA from (very small) bulk samples.

How is the science portion of an ATBI Conducted ?

There are 2 concurrent and mutually informative approaches: 1) Traditional – where taxonomic authorities who are very experienced with their particular group, traverse the reserve, and use specialized techniques to discover and document species, and 2) Structured – a set of biodiversity reference points are arrayed across different habitats and may be actively or passively sampled at intervals year-round, using techniques selected to collect the widest number of species. Results from these 2 approaches are complimentary: traditional sampling is more geographically extensive and very efficient for the group sought but is narrow in scope and intermittent at best, while structured sampling is temporally extensive and for a wide # of groups, but at fewer sites. Trained volunteers can extend or intensify sampling in both approaches.

How did this type of project get started?

The ATBI idea originated from a 1993 international science conference in Philadelphia, organized by Drs. Dan Janzen and Winnie Hallwachs in response to the dearth of scientific data on the global biodiversity crisis. The idea is to conduct an intensive project at the resolution of a natural area reserve. After the first attempt in Costa Rica failed in 1996 due to in-country politics, park managers at Great Smoky Mountains National Park USA, began the second effort, which continues. Starting by visiting the Costa Rican project, in 8 years of pilot field work at the Smokies, several thousand records of species not reported previously in the park have been documented, plus an additional several hundred species new-to-science.

What are Bio-blitzes, and how do they fit in ?

Bio-blitzes are where volunteers team up with scientists for intensive, weekend mini-inventories usually targeted at particular groups or areas. Bio-blitzes can be very productive in terms of species documented, and are always educationally valuable.

Forethought needs to be given to careful data collection during these rushed events. Some reserves do bio-blitzes but have not yet committed to a full ATBI. That's fine, its great to get started at any level. Reserves that undertake ATBI's will likely have many different bio-blitzes.

What is the ATBI Alliance ?

The ATBI Alliance is an organization made up of parks and reserves in the US that have committed to undertake an ATBI, and are collaborating to assist each other in: acquiring funding, coordination of scientists, setting self-imposed data documentation standards, sharing educational ideas and taxonomic expertise. The organization is not formally chartered yet (as of mid-2007), but is functioning legally as a subcommittee of Discover Life in America, Inc., a 501 (c) (3) non-profit chartered in the state of Tennessee, USA . The Alliance is a "bottom-up" type organization. It will have its own Board of Directors when chartered, but will receive general priorities and advice from an annual "congress" of representatives from all ATBI's nationally.

What reserves are in the Alliance ?

The ATBI Alliance is a loosely knit confederation of several dozen US National Park Service units across the US, but also includes non-NPS reserves such as: Tennessee State Parks, New York's Adirondack Forest Preserve, a coalition of Nantucket Island (MA) private conservation organizations, led by the Maria Mitchell Foundation, and other reserves that want to know and understand what resources they manage. It is growing rapidly.

What Support Should a Park or Reserve provide to initiate an ATBI ?

Reserves will need to get: previous relevant scientific work organized for inclusion in a database, have at least some provision for low cost housing for scientists, minimal place to work (sorting samples, data entry, etc.), maps and other orientation materials, helpful advice on the reserves' natural history & different habitats, assistance obtaining permits, office space/utilities for the non-profit partner/coordinator. Staff time is required to advise in study design and other start up actions, but after a period of time, most field activities are conducted by scientists, partner staff and trained volunteers.

Reserve staff may elect to conduct a portion of the scientific field work themselves, such as the structured sampling, since it may become a baseline for quantified monitoring. However, data management should always remain a priority for the reserve staff – in planning, science contacts, and as data is collected, more staff time will be required for QA/QC and analyses.

What are the goals of the Alliance ?

In addition to mutual assistance and coordination, the organization wishes to complete ATBI's in a number of reserves across the United States. Following pioneering work first in Costa Rica, and currently at Great Smokies, a number of the tasks and pitfalls involved in reaching goals are now known. In addition to providing critical information on a number of important ecological reserves, if ATBI's are well arrayed across most eco-regions of the country, it should be possible to provide the first comprehensive

assessment of biodiversity in the US...while involving thousands of Americans of all ages and ethnicities in science and nature-oriented studies.

How do scientists benefit ?

Taxonomists, ecologists and geneticists are some of the scientific disciplines involved. Information on what species occur in which reserves, and discovery of new species is very helpful to taxonomists who work out the systematics (genetic relatedness) of all the groups of life. ATBI's offer an uncommon opportunity for geneticists and taxonomists to work together on field projects. Ecologists are interested in almost all aspects of the inventory and relating them to other aspects of the terrestrial, aquatic and marine environment. They calculate species-area curves to estimate biodiversity in each habitat and species-sampling effort curves to refine methods. ATBI's provide an unparalleled opportunity to study total life in an area, or particular species groups. Additionally, the Alliance will stimulate study in the sciences, especially taxonomy, by exposing students to scientific discovery.

How do conservation agencies benefit?

Agencies gain critical data on what occurs in their park, distributional data and much ecological information on their thousands of species. No land management agency would ever have the ability to access the comprehensive depth of species expertise that ATBI's allow. Agency benefits : rare species discoveries, detection of invasive exotic species infestations, a deeper understanding of the many ecological processes operating in their reserve, and a baseline upon which future changes in local biodiversity can be assessed...all of it providing the best information for management decisions. First iteration distribution maps for *many* species in the reserve can be created. While agency personnel must be involved at first, most activities will eventually be planned and led by scientists, trained volunteers, and partner staff. Agency staff should plan to be well involved in data mgt. efforts from the start.

What about education?

Adults and students are trained and involved in group and individual activities. Usually these group activities are led by scientists or non-profit partner staffs, but also by trained volunteers. Younger children have limited value in contributing to real science, but they are always excited by exploration and discovery such as that offered by bio-blitzes. The recent book by Richard Louv, *Last Child in the Woods; Saving Our Children from Nature-Deficit Disorder* (Algonquin Books, 2005) presents a compelling case for involving children in exactly the kind of activities ATBI's offer. Older youth and adults can be utilized in areas of special skills and interest, and both have made discoveries of species that turned out to be rare, and even new-to-science. People of all ages who get involved in parks feel more attached to them, emotionally and politically. Educators also can act as "talent scouts" for the sciences, referring students/youth with serious interests for greater involvement with scientists.

How will the Alliance be funded?

Important points here are that each ATBI project is expected to organize and cultivate its local volunteers, scientists and funding opportunities, although some areas may be

lacking in one or more of these assets. Some agencies, such as the National Park Service may start to offer matching funds for non-federal monies obligated to approved ATBI's. In addition, the small central staff envisioned for the Alliance will have a primary goal of major fund raising from non-federal sources. To date scientists have also been successful in gaining funding for their ATBI activities from competitive, peer reviewed proposals to the National Science Foundation, and many other local, regional and national sources. Further, education specialists have been successful in receiving grants for teacher training, materials for activities, and interpretive exhibits.

How long will it take ?

This depends on the size and complexity of the area. We don't have a good estimation of how many species we will encounter at any reserve – yet. Much also depends on funding, and availability of the increasingly scarce taxonomists. With adequate funding, most species groups in a small reserve could be documented in a few years or less. We are constantly looking to improve efficiency in sampling, but no project can find every last species. It would probably take longer to find the last 10% of the species in any group than the first 90%, so “stop rules” are invoked at sample sites when sampling efficiency drops . Some of these “missing” species will be picked up in sample replications.

What are the anticipated long term benefits of the ATBI Alliance ?

- If adequate reserves in each eco-region join in, the first comprehensive assessment of biodiversity of the United States.
- A national array of natural reserves of all sizes that have superior information about their reserve...for follow-on ecological science and wise stewardship decades hence.
- A large segment of the public that is involved in the protection of natural biodiversity, and who cares for natural areas where they have helped discover it.
- A cadre of professional and para-professional taxonomists in each eco-region to support further efforts in monitoring
- A model for the world

End.