All Taxa Biological Inventory Workshop, April 1993: An Overview*

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In April 1993, 57 specialists convened a three day workshop at the University of Pennsylvania in Philadelphia to discuss the concept and mechanics of an All Taxa Biological Inventory (ATBI). Participants had backgrounds in managing biotic surveys or information and represented more-or-less the full range of terrestrial and freshwater taxa. For logistic reasons, the marine environment was excluded from discussion, although several representatives were present to provide cross linkage to similar processes underway among marine scientists. Most participants came from the United States; Canada, Mexico, Costa Rica, Brazil, Norway, England, and Australia were also represented. The workshop was organized by Dan Janzen and Winnie Hallwachs with funding from the United States National Science Foundation (NSF). The workshop was intended, in part, as a planning process for possible NSF involvement in an ATBI. It is anticipated that follow-up workshops will be more international in scope. An overview recently appeared in *Science* [260:620-622, 30 April 1993], so details will be the focus here.

For discussion purposes, the physical characteristics of an ATBI were expected to be as follows. Some of the parameters are determined by biological needs; others by logistic or political realities. An ATBI should be a single large site, 50,000-100,000 hectares, including diverse habitats. The site should be subject to long-term preservation (e.g., national park or similar status) but should include disturbed habitats. An ATBI would be a complete inventory of all taxa to the maximum extent possible, including fungi, bacteria, and viruses. Collections will be made within a grid system (GPS/GIS-referenced) via sampling strategies that allow maximum information retrieval in the future and will be appropriately vouchered. Modern information management, including global interactive access to data via Internet, is crucial. For simplicity, one ATBI site is referred to here, but it is expected that when one gets underway others would be started in other countries.

An ATBI must be a cooperative, synergistic effort, with all involved working closely together. For example, birds have insect parasites, which have protozoan parasites, so sampling strategies must be coordinated. Training of systematists, as well as land managers and others, will be incorporated. The inventory would include passing the species collected "through the filter of what we know" to add biological and phylogenetic information to the knowledge base.

As has been recognized by Association of Systematics Collections (ASC) workshops in recent years, there is a serious lack of trained systematists, as well as collections and research facilities for microbes and many invertebrates (especially non-arthropod, non-mollusk invertebrates). Diana Lipscomb observed that "the biosphere of systematists has more holes than the ozone layer." An ATBI would require a major infusion of effort into these fields. Where will the people come from? If training opportunities and jobs are available, experience with other projects shows that people will emerge to meet the challenge (this was referred to as the "Field of Dreams" concept [after the movie of the same name]—"If you build it, they will come").

In order to be successful an ATBI must be fully collaborative. The plan must be developed and managed by local constituents in cooperation with scientists and the various user communities. This workshop focused on ascertaining the technical and scientific issues of feasibility to carry out an ATBI. Further workshops must focus on user needs and local involvement, including such areas as biodiversity prospecting, ecotourism, education, and science-based industries.

A single ATBI would cost US$ 50-150 million. After two years of planning and gearing up, the inventory would take about five years. It is hard for systematists, accustomed to their traditional budgets, to plan in numbers this large or time frames so short! We tend to limit ourselves by this mindset because clearly this is cheap compared to current expenditures in space, physics, or military. NASA has already spent over US$ 8.5 billion just planning the space station! An ATBI site might include some 100,000 to 150,000 species, yielding a unit cost of something like US$ 1000 per species.

After an ATBI has been "completed" the site would continue to be used for monitoring,

research, education, and training. Thus, although the major inventory activity would occur during five years, an ATBI would be an ongoing process. Depending on the site, it may even convert to a region of renewable resource exploitation, such as that for ecotourism.

The products of an ATBI will include: complete inventory of a site; a step toward world taxonomic inventory; benchmarks and a "known universe" for research in ecological and environmental change; standards, protocols, and methodologies for sampling and monitoring; a platform for ecological studies; training; demonstration of the significance and capabilities of systematics; detailed knowledge of patterns in biodiversity of all taxa on a landscape scale; paper and electronic manuals of the biota that will be useful far beyond the local site; and public exposure to the importance of systematics and conservation. The importance of the last item cannot be over stated—the scale of the ATBI will attract public and governmental attention in a way that almost no other systematics activity can!

Involvement of the systematics community is vital to an ATBI. In providing an example of the value of systematics and as an opportunity for building international funding for systematics infrastructure, an ATBI could contribute greatly to the health of systematics. Both the proponents of ATBIs and the Systematics Agenda 2000 steering committee have arrived at the importance of building world systematics infrastructure in order to understand the diversity of life on Earth. Now we just need to find a way to do that!

The ATBI concept can be perplexing if viewed in traditional terms. The group dynamic at the workshop was interesting in this regard. For the first day or so, many of the participants were greatly concerned by the scale involved and doubted the ability of our community to rise to the challenge. But as they saw the power in the concept and the potential for international partnerships to develop the resources, the mood changed to remarkably positive. Shortly after the mood shift, the group heartily endorsed the importance of choosing a site with "spectacular diversity." Most systematists at the workshop, when asked about their particular specialties, thought it was feasible.

After the workshop, the author undertook his own nonscientific survey of some members of the public and found that the concept of knowing everything about what lives in one place was exciting to people who might not find most of biology of interest. There is an intrinsic appeal to the ATBI concept that provides a major hook for funding.

What happens next? The workshop report should be distributed in September 1993 and will lay out a plan in more detail. First, an initial site must be identified, starting with local and national commitment to support an ATBI. After national support has been assured, funding must be solicited internationally. Then the scientific and management team must be put together. Detailed planning and action will continue.

Some interesting remarks overheard during the workshop:

An ATBI is "a tool for monitoring the health of life on Earth"

"There is a need to restructure taxonomy - by planning versus historical accident - driven by societal needs"

"ATBI is as much a political as scientific act, calling attention to the biodiversity problem"

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