Conservation Matters:
Contributions from the Conservation Committee

NatureServe and the Natural Heritage Program Network

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NatureServe and state and provincial Natural Heritage Programs have a huge positive impact on lepidopteran conservation in the Western Hemisphere. Yet lepidopterists are largely unaware how these two intertwined entities operate, nor do most of us appreciate the immense impact they have on Lepidoptera conservation in North America and much of Latin America. Every state and province in northern North America has a Natural Heritage Program embedded in government or a university, and together they inventory, catalogue, and support conservation of the rarest species and the most outstanding elements of the natural diversity in their state or province. This applies to entire countries in Latin America. These elements of natural diversity include all the natural communities native to a region as well as those plants and animals which are so rare that they need special conservation attention.

Natural Heritage Programs follow methodology developed by The Nature Conservancy (TNC) which helped to establish the first state Natural Heritage Program in 1974. Over the next two decades, The Nature Conservancy and a collection of public and private partners built a network of Heritage Programs in the United States to collect and manage data about the status and distribution of species and ecosystems of conservation concern. As originally envisioned, Heritage Programs were designed to identify where the best examples of habitats that occurred in a region, as well as the best sites for conserving rare species – the "*last of the least and best of the rest*" approach. The data were used to guide conservation actions, and Heritage Program data served as the underpinnings of many state nature preserve systems and TNC's global acquisition and stewardship efforts. As this network expanded to include Canada and Latin America, natural heritage programs became the recognized source for comprehensive and detailed information on rare and endangered species and threatened ecosystems, relied upon by government agencies, corporations, and the conservation community alike. No environmental impact statement is complete without a Heritage data review. TNC, which had provided scientific and technical support to the network, transferred this role to NatureServe in 1994, along with professional staff, databases, and responsibility for the scientific standards and procedures under which the network operates.

NatureServe (*www.NatureServe.org*), a non-profit membership-based organization, represents an international network of biological inventories—known as Natural Heritage Programs or Conservation Data Centers—operating in all 50 U.S. states, Canada, Latin America and the Caribbean. Although every Heritage Program is unique, operating within a defined geographic area and variously housed within some institutional setting, they are focused on gathering the information required to protect natural resources in their region. That work goes beyond collecting and managing detailed local information on plants, animals, and ecosystems, and includes the development of information products, data management tools, and conservation services to help meet local, national, and global conservation needs. NatureServe coordinates the basic framework that guides this activity, ensuring that there is global data quality and proper interpretation. This results in objective scientific information about species and ecosystems that is used by all sectors of society—conservation groups, government agencies, corporations, academia, and the public—to make informed decisions about managing our natural resources.

How does this all relate to Lepidoptera conservation? The underlying Heritage methodology was designed from the start to support a "coarse filter / fine filter" approach to building a complimentary system of conservation reserves. Coarse filters are intact ecological systems that, if effectively conserved, protect the majority of species in the system. The coarse filter idea is simple – conserve the best examples of ALL ecological systems in a region, and you are likely to conserve the majority of all species on a regional basis as well. Heritage data doesn't just tell us the names of the communities and where they are, but also includes detailed assessments of each site's ecological integrity and long-term viability, ensuring that sites with the best chances of maintaining their complete communities, moths and butterflies included, are priorities for conservation. A complementary system of reserves (a reserve system that

protects multiple examples of all ecological systems in a region) plays an obvious and intuitive role in conserving Lepidoptera species, both common and rare.

There are, however, species that slip though the coarse conservation net. In the US and Canada, Heritage Programs track these species as well. These rare species form the "fine filter" of conservation. In North America, these species can be found in almost every taxonomically well known group, but in Latin America and the Caribbean it is primarily focused on vertebrates – a reflection of the immense species diversity present in tropical systems, resources, capacity of staff, and status of knowledge. Although most rare Lepidoptera use rare ecological communities and are likely to be picked up in sites identified as coarse filters, there are exceptions. In the Midwest, Mitchell's satyr is a good example – it uses a fairly uncommon habitat type, wetland system known technically as *North-Central Interior Shrub-Graminoid Alkaline Fen*, but presence of the butterfly is not necessarily correlated with botanical composition or obvious measures of botanical habitat quality. Conservation efforts that focused exclusively on the best examples of this wetland type would conserve some amazing habitat, but just a few populations of Mitchell's satyr. More importantly, we would miss some of the best opportunities to protect populations of the satyr, which often occur in mundane wetlands.

To accommodate this potential oversight, heritage programs track individual species which are thought to be globally rare, and state programs usually track state rare species as well. Again, these data go beyond simple dots on maps and usually include some assessment of population health if known. NatureServe has developed extensive guidance for assessing populations of species or guilds of species, as well as an overview of the conservation issues surrounding the species – most of this text for the Lepidoptera was written by Lepidopterists' Society members Dale Schweitzer and Paul Opler. Go to NatureServe.org and take a look at a federally listed species abstract and you will almost certainly be surprised at the depth of the conservation text provided.

It's also worth noting something that the NatureServe data are not – a complete record of occurrence data for all species of plants and animals. The magnitude of such a database would be overwhelming. NatureServe data are limited to species of conservation concern, those ranked G1-G3 and in the states where they are imperiled, species ranked S1-S3 as well (see side bar for an explanation of G- and S- ranks).

Where Heritage Programs exist, they often play a quintessential role in conservation. For example, the Indiana Department of Natural Resources manages a system of 210 State Nature Preserves that is explicitly designed to protect representative examples of all terrestrial community types across the state. A few years ago, I assessed how well this system performs relative to conserving state-rare butterflies – and it does exceptionally well (Shuey, 2005, American Midland Naturist 153:117-127).

Planning in the Central Tallgrass Prairie Ecoregion is similar to ecoregional planning efforts across the entire US, relied on Heritage data from six Midwestern states to identify the best opportunities for conserving the finest examples of ecological communities in this agriculturally dominated region. Just as importantly, Heritage data were used to identify clusters of sites where restoration would have the greatest impact for conserving imperiled prairie systems and species. At one of those sites, Kankakee Sands in Illinois and Indiana, almost 12 square miles of sand prairie restoration is designed to heal a landscape that spans over 30,000 acres. The site supports an intact prairie and savanna lepidopteran community, including the eastern most prairie-inhabiting *Speyeria idalia* population.

In Latin America, national strategies for conservation have often been underpinned by Heritage data. For example, heritage data was used in

Interpreting NatureServe Conservation Status Ranks

(extracted directly from the NatureServe Web Page - *http://www.natureserve.org/explorer/ranking.htm#interpret*)

The conservation status of a species or community is designated by a number from 1 to 5, preceded by a letter reflecting the appropriate geographic scale of the assessment (G = Global), N = National, and S = Subnational). The numbers have the following meaning:

1 = critically imperiled

2 = imperiled

3 = vulnerable to extirpation or extinction

4 = apparently secure

5 = demonstrably widespread, abundant, and secure.

For example, G1 would indicate that a species is critically imperiled across its entire range (i.e., globally). In this sense the species as a whole is regarded as being at very high risk of extinction. A rank of S3 would indicate the species is vulnerable and at moderate risk within a particular state or province, even though it may be more secure elsewhere.

Extinct or missing species and ecological communities are designated with either an "X" (presumed extinct or extirpated) if there is no expectation that they still survive, or an "H" (possibly extinct or extirpated) if they are known only from historical records but there is a chance they may still exist.

Columbia to identify sites that, if conserved, would protect ecological systems and species that were poorly represented on conservation lands. In response, Columbia created two new protected areas in 2007, Complejo Doña Juana y Cascabel National Park (240,000 acres) and Serranía de Churumbelos National Park (287,000 acres). These two parks protect 825 square miles of moist and tropical cloud forests in the Columbian Andes—habitat that is home to rare and endangered species such as the spectacled bear, the mountain tapir, the Andean condor, and the puma, as well as 461 species of birds. No doubt both parks are home to amazing assemblages of Neotropical butterflies, moths, and other wildlife.

We, the members of the Lepidopterists' Society, can help the network to be more effective in conserving insects and other invertebrates that we find dear. Most Heritage biologists are plant ecologists, botanists or vertebrate biologists. It's a rare program that has a staff member dedicated to insects, or even staff with appreciable knowledge of invertebrate biology. Hence the data for global and state imperiled Lepidoptera is thin, usually biased toward more charismatic species or Federally Endangered species (a designation which inevitably results in federal funding for inventory work). State-level rankings for Lepidoptera are often based on best guesses with variable accuracy that is refined only as new data emerge. Population trends, especially slow and steady changes, usually go unobserved by Heritage staff until the situation is obvious. For example *Cyllopsis gemma* in Indiana is on the increase and spreading northward – its S2 rank probably needs to be amended to reflect this improvement in fortune for the species. Similarly, no one has seen *Chlosyne harrisii* in Indiana in decades, it may well be extirpated despite its S2 ranking.

Our members are in the field constantly, looking for unusual species and sampling interesting habitats. Every heritage program in Canada and the US would love to know what we collectively know about global and state ranked species. And it is pretty easy to move that knowledge to them - a simple phone call or email to your local heritage program is likely all it takes to get the ball moving (find contact information at *http://www.natureserve.org/visitLocal/index.jsp*). Most state programs have (on-line) data forms that can be printed and submitted. While the data fields are a bit overwhelming, I always keep the information I provide lean but accurate. Once incorporated into the geographically referenced heritage database, your contributions are then available for use in conservation planning, environmental impact assessments and formulating habitat management decisions.

The alternative – not sharing our collective knowledge – is tantamount to helping those who would destroy or develop high-quality habitats. I've always argued that our membership has a major role to play in conservation – that our collective experience and knowledge has more value than reductionist dot-maps in field guides. If we ever expect to leverage our insights to exert some measure of influence with conservation organizations, then we need to engage. The primary threat to Lepidoptera diversity is habitat loss, and we, the members of the Lepidopterists' Society, can actually do something about it.

An Undescribed Species of *Carystus*

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Pelham Catalogue

The long-awaited *Catalogue of the Butterflies of the United States and Canada,* by Jonathan P. Pelham was published in March, 2008. Published as Volume 40 of the Journal of Research on the Lepidoptera, this incredible resource can be ordered from BioQuip for $25.00.

The catalogue is 648 pages long and lists all the taxa and their synonyms of all butterfly species found in North America north of Mexico.