NEW INVADERS WATCH LIST PROGRAM, DEVELOPMENT OF DATA MANAGEMENT AND WEB RESOURCES TO TRACK TARGET EXOTIC, INVASIVE PLANT AND INSECT SPECIES N THE GREATER CHICAGO AREA

A Final Report

Funded by Chicago Wilderness in through the Illinois Conservation Foundation Grant #FS0215

By

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The following is a final report on the activities of the Illinois Natural History Survey (INHS) related to the building of the New Invaders Watch List (NIWL) website and databases funded by Chicago Wilderness (CW).

**Activities Proposed by INHS**

- **Database and Web Module Construction.** This activity consisted of construction of an exotic, invasive species databases for capture of data, production of web pages to disseminate information and that link web development to databases. Data modules included are to capture volunteer data, route new records to professional botanists for verification, and notification of public property owners conducting responses to sightings.

- **Construction and Printing of Target Species Field Guides.** Accumulate from various sources, or produce anew, text, line drawings, and photos for use in field guides to NIWL target species. Contract with local printer to produce user-friendly, durable field guides for use by volunteers.

**Tasks Completed by INHS**

**Database and Web Module Construction and Maintenance.** The INHS constructed the NIWL website and background databases. The website (Fig. 1), at [http://ctap.inhs.uiuc.edu/newinvaders/](http://ctap.inhs.uiuc.edu/newinvaders/), currently supports the following pages: Recent Sightings; About Us; What are Exotic Invasive Species?; NIWL Target Species; Become a Volunteer; Data Form, Glossary, Voucher Specimen Prep; Report an Invader; Primary Collaborators; Related Links; Sponsors and Acknowledgements.

  Recent Sightings provides a look at what has been reported recently in the CW area. About Us discusses partners, the reasoning behind starting in the Chicago area, what our goals are, and the key components of our program. “What are Exotic Invasive Species?” provided a brief discussion of what constitutes an invasive species, provides links to more detailed definitions, discusses important reasons for opposing invasives, provides a link to help debunk myths about invasives, and discusses the economic and environmental impacts of invasives.

  NIWL Target Species provides a list of the 15 plant and two insect species on which NIWL has chosen to concentrate. Each of these names links to a single species web page that provides taxonomy, general appearance, information on habitats at risk, photos, and links to other sites with pertinent information (Fig. 2).

  The Become a Volunteer page suggests several ways that volunteers can help NIWL with the program. It also provides a sign-in page to register new volunteers. NIWL representatives are notified of new registrants via e-mail and are asked to visit the website to activate the volunteer’s file. Upon activation, a notice is sent to the volunteer telling him or her of their activation.

  The page Data Forms, Glossary, Voucher Specimen Prep, provides volunteers with downloads of field data entry forms, definition of terms or data fields, and guidance for how to create voucher specimens. Volunteers then go to the Report an Invader page, sign-in, and can create a new record for a target species (Fig. 3). INHS has designed a web data entry page that follows the design of the field form. Each new record is given an unique identifier (date and time related). Information about each target species record is captured, including species name, date, several geographic descriptors, and digital images (volunteers may upload up to five images), if they exist. New records for plant target species are forwarded by e-mail to Dr. Geoff
Levin of the INHS, who reviews the record, looks closely at associated images and any herbarium material that has been submitted, and records his opinion of whether the record is the species the volunteer says it is, is not a target species, or that the record is inconclusive. These responses are recorded on the website and volunteers are e-mailed notifications stating the verifier’s decision. Insect records are sent to Dr. R. Edward DeWalt for verification. Geographic descriptors for each record are many, including state, county, public land owner, and public land name. These descriptors help NIWL associate a verified record with a potential responder who is notified by e-mail of a new record. This responder module was not satisfactorily completed by NIWL, but is the focus of a second CW grant from their small grant program.

Primary Collaborators provides a list and hyperlinks to six organizations that have primary responsibility for the NIWL program, including, The Nature Conservancy, Illinois Natural History Survey, Lake County Forest Preserve District, Natural Heritage Program, IL Dept. of Natural Resources, Chicago Wilderness Coalition, and the US Fish and Wildlife Service.

Related Links provide access to a searchable database of other web sites that concentrate on invasive species in North America. The Sponsors and Acknowledgements page details those who have provided financial support to NIWL, for which we are grateful.

Construction of Field Guides. The INHS has completed data accumulation, layout of the field guides, and printing of the cards. In total, 3,600 guides were produced, each with 18 pages of text, images, and line drawings. The first page provides a description of the program and how to use the cards. Subsequent cards are composed of multiple color photographs of target species covering several aspects of their morphology. The back of each card has line drawings, brief text that details the species’ characteristics, the habitats they invade, and possible look-alikes. To facilitate use of these field guides, the dimension of each page was set to 3 X 5 in. and each page laminated. These cards were then hole-punched at one corner and a sturdy ring provided to keep the entire card set together. A $2.00 replacement cost was charged to those organizations that had funds for such purposes. So far, 700 card sets have been sold. Another 1,000 have been distributed to organizations at no cost. Proceeds of $1,400 now exist in the INHS Publications Account and are being used as match in the CW Small Grant program award to the INHS. These will be used as partial payment for cards sets for five new target plant species being added to the NIWL program over the next year.

Performance Characteristics of the Database and Web Modules. The web pages function as designed. Databases holding target species information automatically inform species pages; hence, pages may be dynamically updated simply by changing fields in a database, rather than by revising an entire document. Changes may be accomplished in minutes, not days or weeks.

Web databases that capture information from volunteers automatically route notification to professional botanists who view the records and record affirmative, negative, or too little information to make a decision. Notification of the verifier’s decision is sent to volunteers, usually within days or a few weeks, depending upon the schedule of the verifier. To date, we have received 44 records of target plant species from seven data recorders, including Debbie Maurer, Debra Nelson, Al Moody, Doug DeWitt, R. Grill, N. Pavlovic, and Frank Hassler. Eight of the 15 target plant species were reported, with Leafy Spurge and Japanese Knotweed being the most frequently reported (Table 1). Volunteers provided vouchers for their plant sightings for 34
records, 32 of those being digital images, while 2 were of herbarium sheets. Vouchers were not provided for 10 records.

Table 1. List of NIWL target species reported by volunteers, their common name, and frequency of report.

<table>
<thead>
<tr>
<th>ScientificName</th>
<th>CommonName</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Celastrus orbiculatus</td>
<td>Oriental Bittersweet</td>
<td>2</td>
</tr>
<tr>
<td>Centaurea maculosa</td>
<td>Spotted Knapweed</td>
<td>5</td>
</tr>
<tr>
<td>Euphorbia esula</td>
<td>Leafy Spurge</td>
<td>17</td>
</tr>
<tr>
<td>Heracleum mantegazzianum</td>
<td>Giant Hogweed</td>
<td>1</td>
</tr>
<tr>
<td>Lespedeza cuneata</td>
<td>Silky Bush Clover</td>
<td>1</td>
</tr>
<tr>
<td>Miscanthus spp.</td>
<td>Japanese Silvergrass</td>
<td>1</td>
</tr>
<tr>
<td>Polygonum cuspidatum</td>
<td>Japanese Knotweed</td>
<td>16</td>
</tr>
<tr>
<td>Pueraria lobata</td>
<td>Kudzu</td>
<td>1</td>
</tr>
</tbody>
</table>

Six counties in two states are represented in the record tally (Fig. 4). However, the number of records is heavily skewed toward Lake Co., Illinois, where 33 of the 44 records originate, and are largely the result of one very dedicated volunteer.

The verification process works well. Thirty-four records were verified by Dr. Geoff Levin or other qualified verifier, 10 others were unverifiable due to the lack of a voucher in the form of either a digital image or an herbarium sheet.

Responses by land managers to these reported records were not recordable through NIWL as proposed for this grant. One reason for the lack of progress on this module is that it takes much time to build partnerships with public land owners to gain permission to use their properties to search for target species. We also must convince these land owners to be involved in the response part of the network, as it commits their employees to answer e-mails, review records on the web and in the field, and record what actions they have taken, if any. INHS must be able to match public land owners with public property names or at the county level across both a list of potential responders and the new record’s geography. Of course, that means we must have a database populated with responders and the geographies for which they are responsible. It has taken us much time to gather this information, but we now have over 40 public property units enrolled in the program. A new CW grant has provided funds to complete programming of the module. We have been working on this module since February 1, 2007 and will have it functional for the 2007 field season.

Conclusions
The INHS has built a regional data management and information dissemination infrastructure for use by volunteers to record new locations and responses to populations of target exotic, invasive plant and insect species in the greater Chicago area. Laminated field identification cards, 3,600 of them, were designed and printed and up to 1,700 of them distributed. Training of land managers and volunteers by TNC and LCFPD collaborators was highly successful. The year 2006 saw the first records of target species reported to the web database, accumulating 44 records for eight species. The verification process has worked well, while the response module has seen delays in development.
While many volunteers have been trained, the recording of new records by them has been slow. Certainly a new round of effort is necessary to get the volunteers excited about locating and reporting target species. Some of this can be handled through e-mailing and hardcopy mailing of volunteers in our database, letting them know that the database is functional. Additional training workshops are necessary to recruit more volunteers. The latter is one function of a proposal to Conservation 2000 by Debbie Maurer.

The collaborators of NIWP are optimistic about the prospects for a productive field season in 2007. The volunteer data capture is working, we have lined up verifiers for the upcoming season, and the responder’s module will be functional in summer 2007 for the first time. Funding prospects seem good currently, and the program has received much need publicity through articles in Chicago area newspapers and in the TNC Magazine.
Fig. 1. New Invaders Watch List About Us web page, describing the partnership, its goals, and keys components of the program.
Fig. 2. A target species page, containing classification, morphology, and distribution of Leafy Spurge, *Euphorbia esula*
Fig. 3. The page Volunteers Report New Invaders that helps volunteers record geography, public property name, target species condition, and upload digital images of the target species.
Fig. 4. Frequency of volunteer reports in states and counties in the Chicago Wilderness area.