

**Biological Control of Invasive Plants Program
Special Technology Development
Final Report and Project Profile**

PROJECT NUMBER: #11-CA-11420004-052

PROJECT TITLE: Biocontrol In Your Backyard Internet Portal

PROJECT STATUS: Complete

ACTUAL COMPLETION DATE OF THE PROJECT: November 30, 2012

SUBJECT: Biological Control of Invasive Native and Non-Native Plants

PROJECT OBJECTIVES:

- ↑ Increase integration of weed biological control knowledge and methods across media to reduce forest health risks associated with invasive native and non-native plants.
 - Bring together existing weed and invasive plant biological control education programs (BLM programs, Bug's with an Attitude, etc.) through an accessible Internet Portal.
 - Consolidate information on existing collaborative weed management programs (Holding the Line, Southern Idaho Biological Control Program, What's In Your World?, etc.) at the same web portal facilitating information sharing, technology transfer, and integrated weed management strategy development.
 - Develop the weed biological control Internet portal to allow future expansion and integration with other invasive plant efforts (regional weed mapping, invasive plant spread models, integrated weed management planning programs, etc.)
- ↑ Provide a user friendly one stop web destination for educators, private citizens, and weed managers for all weed biological control information.
 - Develop appropriate security protocols to insure material at the web portal will not be corrupted.
 - Develop a marketing strategy to inform the public of the portal's existence.
 - Develop a tracking system to assess the project's impact on participant's weed biological control activities.

BRIEF DESCRIPTION OF PROJECT:

The Forest Health Technology Enterprise Team calls for Federal, state, and private agencies to form partnerships to adequately address the spread and impacts of invasive plants (USDA Forest Service 2010); and to aid in the development and transfer of technologies aimed at increasing the use of biological control methods. This project captures four successful biological control outreach programs through digital motion and still media, creates an Internet portal—using BUGWOOD's newly acquired technologies, and provides a platform on which to add additional weed web-based activities, such as distribution mapping, modeling, and treatment. This project uses technology in new ways to increase public participation (Bell et al. 2009) in weed and weed biological control learning and action.

The weed biological control Internet portal project will focus on features of the web to support weed biological control science learning and management in ways that other media do not e.g. receiving and sending information in contrast to print media. According to the Pew Internet and American Life Project, the internet is the second most accessed media for science information (Bell et al. 2009), second only to television. The majority of respondents would turn to the Internet first to find information on specific scientific topics.

The proposed Internet portal will allow users to design how they access information; allowing them to iteratively explore the world of invasive weed biological control in one fluid process. The portal will lead Internet users to credible, tested biological control teaching tools, training modules, community assistance programs, and opportunities to participate in integrated weed management programs with a biological control component.

CHANGES TO PROJECT SCOPE OR OBJECTIVES:

The technology development for a biological control Internet portal was initially proposed as a combined project with other partners interested in a documentary film *and* an Internet portal for a total project cost-sharing equal to \$163,750; of which the FHTET special technology program cost-share request was \$75,000 for the Internet portal component. The proposal for FHTET dollars in the amount of \$75,000 to match with others in the combined projects was not funded. Instead, the deliverables dependent upon the combined-projects (documentary film and Internet Portal scope) were removed from the proposal.

A redraft of the proposal narrowed the project scope to the Internet portal; which was subsequently funded at \$33,000 from the Biological Control of Invasive Plants Program with a 25% cash match of \$11,000 from the Project Manager for a total project cost of \$44,000. In a conference call with the Forest Health Technology Enterprise Team regarding changes to the proposal and the resulting reduced award, the project scope was reduced to reflect a feasible performance on previously defined combined-project deliverables.

Removed from the Internet portal project scope, the originally proposed 27-minute documentary film and half of the video training clips with associated steering committee in-kind contributions represent a reduction amounting to approximately \$119,750. That said, education program steering committee members, the project manager, and others who are interested in the technology transfer value inherent in the training clips continue, outside the scope of this project, to output media resources that appear and will appear in the Internet portal. Details of the in-kind efforts (~\$119,750) that were removed from the original project scope as a result of the reduced award do not appear in this final report.

BRIEF DESCRIPTION OF PROGRESS THIS YEAR:

July -September 2011

October - September 2012

- (1) Capture 4 bio-control education programs in still and motion digital media.
Performance: Travel to four project areas, conduct participant interviews, document future steps: interactions and program integration opportunities.
 - (2) Collect and format existing curriculum, film clips, training modules, resources
Performance: Collect and format existing materials for Portal uploads.
 - (3) Develop training modules based on 4 bio-control education programs.
Performance: 12 short clips, 3 per program; to be accessed by one gateway.
 - (4) Develop gateway outline (access) and image (design) for targeted audiences.
Performance: Create site map, develop graphics; format and upload.
 - (5) Use newly developing technology in new ways to disseminate information.
Performance: Provide input to developing technology; upload content.
 - (6) Organize training modules, expert network, and linkage to existing resources.
Performance: Develop logical sitemap access to existing links and modules.
 - (7) Develop/disseminate communications for news/spokesperson opportunities.
Performance: Facilitate and complete a comprehensive communication plan.
 - (8) Create public service announcements (PSAs), training clips, and documentary.
Performance: 9 PSAs with media contact list for western United States.
Performance: 12 training clips - 3 per program
 - (9) Evaluate process and progress using a decision support mechanism.
Performance: Track and submit process/progress reports (qtly/annual).
- Ongoing
- Performance: Initiate a mechanism tracking impact on public response.
 - (10) Collaborate on a peer-reviewed paper and associated project reports.
Performance: Submit draft to one academic journal.

Between July 2011 and September 2012, managers of four youth biological control education programs in the Intermountain West contributed resources with

enthusiasm and completeness. Each program manager provided access to student projects, field-learning events, and archives; resulting in resources for the Internet monoculture and biological control agent media library. The Principal Investigator participated in 10 teacher training workshops where teachers learned how to integrate biological control concepts into existing curriculum and youth education programs; and student service learning field events like the *Holding The Line Project* in southwestern Idaho where teacher-led programs provided biological control concepts and skills training at a landscape level.

Additional highly credible events provided resources and content for the Internet Portal in summer 2012. For example, the *Idaho Student Bug Crew* teacher and crew training activities, which occurred in June hosted by the Forest Service, Bureau of Land Management, University of Idaho Extension Service, and Idaho Department of Agriculture. A teacher who attended a Salt Lake County *Utah Invasive Plant and Bugs With An Attitude* training workshop conducted a summer academy for Grades 6 through 12 to establish toadflax collection and release sites. Content provided from the Logan High School and Utah Starr Summer Academy is an example of how easy it is for teachers to use training resources available in the *Biocontrol in Your Backyard* portal.

The technology team at the University of Georgia's The Bugwood Network provided technical guidance to establish the Internet portal, create and maintain the media library, and sustain the portal as a means for the youth program managers to collect and share lessons learned in the future.

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HP LEAD INVOLVEMENT. The BCIP Technical Working Group Contact, Carol Randall, provided technical review and helped guide the development process with steering committee members: Janet Valle, State and Private Forestry Regions I and II; Sage Fitch, Salt Lake County Public Works; Chuck Bargeron, University of Georgia and The Bugwood Network; and Carla Hoopes, InterMedia Productions Partnerships LLC.

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PRINCIPAL INVESTIGATOR INVOLVEMENT. The Bear River Resource Conservation and Development Principal Investigator, Cami King, provided administrative and grant management for the project working closely with the Project Manager, Carla Hoopes.

COOPERATORS:

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COOPERATOR INVOLVEMENT. Carla Hoopes consolidated content, organized and formatted the media according to the design emerging from the steering committee. Carla assisted Sage Fitch in the development of quarterly activity reports and financials, which were provided to the Principal Investigator Cami King. Carla coordinated with Chuck Bargeron and Joseph Laforest to ensure media formatting met the motion and sound technologies in the new *video.bugwood.org* streaming library for the *Biocontrol In Your Backyard* portal. The Bugwood Network put in place an analytics for tracking visitor movement in and around the biological control Internet portal.

Special thanks go to four Intermountain West education program managers who contributed their time and education resources for the Internet portal--efforts that are critical to but outside the scope of the required project in-kind contribution:

- ◆ Becky Freiberg and Joey Milan, *Idaho Student Bug Crew*;
- ◆ Todd Breitenfeldt and Mike Battaiola, *Bugs With An Attitude*;
- ◆ Kim Ragowski, Joey Milan, and Becca Schneiderhan, *Holding The Line Project*;
- ◆ Kathy Stopher (Bear River Migratory Bird Refuge) and Brittany Simon (Ophir Elementary), *Whats In Your World—Youth Naturalist approach to Weed Science*

Additional cooperators provided educational and training resources and peer-review: USDA Forest Service - Dwight Scarborough, Dayle Bennett, Liz Hebertsen; Cache County Weed District - Joel Merritt, Eric Bingham; and USDA, Animal and Plant Health Inspection Service, Plant Protection and Quarantine: Amber Mendenhall (UT) Gary D. Adams - State Plant Health Director and Richard (Joe) Merenz (MT).

FUNDING

- 1) First fiscal year funded: 2011
- 2) Funds obligated from beginning of project through final fiscal year:

Fiscal Year	STDP BCIP Funding	Other-Source funding	Source
2011	\$ 4,795	\$ 9,677.85	Project Manager, Carla Hoopes
2012	\$28,205	\$ 2,181.87	Project Manager, Carla Hoopes

- 3) Funds not used from previous fiscal year: all funds were used

B. PROPOSED OUTPUT(S):

- 1) Proposed Outputs Prior to Project Scope Reduction (*reductions in italics*)
 - (1) Capture 4 bio-control education programs in still and motion digital media.
Performance: Travel to four project areas, conduct participant interviews, document future steps: interactions and program integration opportunities.
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 - (3) Develop training modules based on 4 bio-control education programs.
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 - (6) Organize training modules, expert network, and linkage to existing resources.
Performance: Develop logical sitemap access to existing links and modules.
 - (7) Develop/disseminate communications for news/spokesperson opportunities.
Performance: Facilitate and complete a comprehensive communication plan.
 - (8) Create public service announcements (PSAs), training clips, and PBS documentary. (*See Changes to Project Scope and Objectives*)
Performance: 9 PSAs with media contact list for western United States.
Performance: 12 training clips - 3 per program. (*reduced to 6 clips*)
Performance: PBS 27-minute lessons learned documentary. (*removed*)
 - (9) Evaluate process and progress using a decision support mechanism.
Performance: Track and submit process/progress reports (qtly/annual).
Performance: Initiate a mechanism tracking impact on public response.
 - (10) Collaborate on a peer-reviewed paper and associated project reports.
Performance: Submit draft to one academic journal. (*underway*)

- 2) Were the proposed outputs delivered?
 The proposed outputs were delivered; according to the changes in project scope and objectives subsequent to the reduced project total: a reduction from \$163,750 total project to \$44,000 total project cost. The documentary film and training clips and associated education program manager and steering committee efforts as in-kind were removed from the project scope. That being said, the proposed Internet portal content is fully delivered, in part because of efforts by the education program managers, project manager, and steering committee members outside the scope of this project. Collaboration on a professional paper and communication plan implementation is underway. The Bugwood Network is implementing the analytics to profile Portal visitor access and application.
- 3) Were the outputs delivered on time?
 Yes, the outputs are delivered within the scope of the project period with quarterly activity and financial reports submitted on time.
 Jan-Mar 2011: steering committee meets, grant proposals submitted
 Apr-Jun 2011: resource identified and collected, Internet gateway designed
 Jul-Sep 2011: The Bugwood Network begins accepting formatted media
 Oct-Dec 2011: resource collection, organization, and formatting augmented
 Jan-Mar 2012: initial peer-review begins, project presentations begin, interagency work groups and workshop sponsors informed of activities on the Internet portal:
 † Utah Starr Summer Academy Field Workshop June 5-6
 † Utah Invasive Weed Teacher Workshop June 15
 † Bugs With and Attitude July 25-27
 Apr-Jun 2012: The Bugwood Network sets up analytics to observe portal visitation prior to launch
 Jul-Oct 2012: Collaboration on professional paper/communication plan underway
 Oct 2012: Final tweaks to content and adjustments at video.bugwood.org
 November 2012: Formal portal launch on the home page of The Bugwood Wiki

C. TECHNOLOGY / METHOD USE

- 1) Were the proposed or actual outputs used? Yes
 a. Describe briefly how outputs were used
 i) List user groups
 Agency land managers
 Elementary, Middle School, High School, and Home School Teachers
 Lay Audiences: kids, students, adults, conservation educators
 University biological weed control / entomology / invasives programs
 Watershed Groups / Cooperative Weed Management Groups
 ii) Time period output used
 Formal portal launch on The Bugwood Network begins November 2012;
 Intermountain West agency sponsored training workshops integrated the content and portal access March-October 2012.
 iii) Geographic extent of use
 Intermountain West during development period

iv) Pest organisms

Seven noxious weeds and their associated biological control agents were highlighted and a number of invasive plants were discussed in media available through the Internet portal.

v) Resources affected/protected (e.g. wildlife habitat protected, risk reduction for insect disease, etc.)

- ◆ Eleven southeastern Idaho counties keep leafy spurge from encroaching on the Caribou-Targhee National Forest.
- ◆ Student bug crews in 9 Idaho counties work across jurisdictions to control Russian knapweed, spotted knapweed, diffuse knapweed, houndstongue, cheatgrass, and leafy spurge from migrating between private land, public land, and natural areas.
- ◆ Service learning programs train teachers in Nevada, Montana, and Utah to design and integrate biological weed control lessons that conform to State required Core curriculum:
 - Bureau of Land Management - California Trails Nature Center (NV)
 - Ophir Elementary School - Big Sky Montana and Gallatin Nat'l Forest
 - Fourth Grade Teachers - Bear River Migratory Bird Refuge
 - Logan High School - Ogden Ranger District (UT) - Hardware Ranch Wildlife Management Area

b.) If outputs were not used provide the reasons the project may not have provided a usable product. NA

i) Negative results

None

ii) Guidance for future development

High school teachers, university entomology program managers, and agency natural area and wildlife habitat managers have expressed interest in the Internet biological weed control portal as a source of information to conduct outdoor labs which will meet the requirements of National Advanced Placement standards and State Core Curricula. The Integrated Pest Management (IPM3) consortium of university, land managers, professionals, and educators is interested in using and adapting access to the portal content for a training module within the University of Minnesota-based Training Consortium; expanding their audience to K-12 teacher training.

The launching of the *Biocontrol In Your Backyard* Internet portal in November also sets the stage for linkages between invasive plant modeling programs like EDDMaps, integrative pest management programs such as taught by the National Conservation Training Center and its Wilderness Training Arm, invasive plant spread models like the

Invaders Database, and university entomology and invasive pest online training consortiums.

iii) Did we learn anything about this project?

We learned how important it is to share lessons-learned, what it means to others in the field of biological control to understand what is working and what is not through case studies. We also learned about the willingness and quality of content available in the Intermountain West. Technological lessons were also learned as we integrated motion video into the <http://video.bugwood.org> at The Bugwood Network. The lesson still to be learned from the <http://video.bugwood.org> prototype launch is how the streaming media is received across the realm of Internet and broadband systems, rural and urban. What issues are we to face with wireless systems in schools, what will we learn about downloading and streaming training films, audio programs, and interactive media for class demonstration on a variety of systems? The project sets a baseline where we can learn why and how teachers access and use the technology.

C. DISTRIBUTION OF OUTPUTS

- 1) University and/or Research Involvement
 - a. University of Idaho contributed data and success criteria for lessons learned; and Utah State University provided continuing education credits for three workshops in which the Internet portal content was integrated
 - b. No graduate theses written
- 2) Dissemination of Results
 - a. One peer-reviewed journal article/paper for publication is underway for the *American Entomologist* publication of the Entomological Society of America. The working title is *Teaching service learning and ecology using biological controls*.
 - b. Number of reports written
 - ↑ 5 quarterly reports and this final report written for project collaborators
 - c. Number of presentations made (meeting/conference(s) & professional society-sponsor(s))
 - ↑ Notification in the form of public service announcements using email listserv:
 - Western Regional Panel on Aquatic Nuisance Species
 - Greater Yellowstone Coordinating Weed SubCommittee
 - Bonneville Cooperative Weed Management Association
 - Western Weed Coordinators Council
 - National Invasive Species Council
 - National Invasive Species Awareness Week
 - Intermountain West youth program leaders
 - Entomological Society of America

Center for Invasive Species and Ecosystem Health
Intermountain Biological Control Working Group

3) Technology Transfer Activities

a. Number of sessions

‣ 5 sessions where a development version of the Internet portal was presented to a group of targeted end users

b. Number of participants: 109

c. List participating agencies and education program lead/organizations

- InterMedia Productions Partnerships
- Salt Lake County Public Works
- U.S. Forest Service, State and Private Forestry Regions 1 and 4
- Bugs With An Attitude - Whitehall Biological Weed Control Institute
- Idaho Student Bug Crew
- Holding The Line Project
- Whats In Your World—Youth Naturalist approach to Weed Science
- Center for Invasive Species and Ecosystem Health—The Bugwood Network