

REVIEW 1

Rate the technical merit of the project:

1. Sound Scientific approach: Approve/continue project
 2. Achievable goals/objectives: Good
 3. Appropriate scope of activity to accomplish objectives:
Excellent
 4. Potential for significant outputs(products) and outcomes and/or impacts:
Excellent
 5. Overall technical merit:
Excellent
- Comments

Overall, this is a good but ambitious project. The project included major invasive insect pests and weeds in the mid-Atlantic States, which has the potential of high impact on agriculture and forestry in general.

However, the milestones may need to be revisited and thought out further. Here are a few comments.

1. (2023) "Assess biological characteristics of natural enemies". I am not sure about this because, if we have imported natural enemies, the biological characteristics of the imported natural enemies should have been well studied before the release in the landscape.

Despite the host range, temperature range etc, of imported natural enemies having been characterized when those species were imported, understanding how they adapt to new environments can fall within the scope of biological characteristics. For example, we are examining the efficacy of biocontrol agents of emerald ash-borer on fringe tree.

We are rewording to "Assess the ecological characteristics of natural enemies"

2. (2024) "Conduct foreign exploration and ecological studies in the native range of the pest". These efforts have been made by the USDA APHIS for all the invasive insect pests and weeds. So, I am not sure what this foreign exploration is for.

This refers to the work on swallow-worts being conducted in collaboration with USDA-ARS and Cornell scientists

3. (2026) "Evaluate efficacy of conservation and augmentation programs on natural enemies". Such a study needs multiple years to confirm the efficacy or effectiveness. I think this is over- optimistic.

We have included this milestone in multiple years to emphasize that this is ongoing work for these projects.

Your Recommendation:
Approve/continue project

REVIEW 2

Rate the technical merit of the project:

1. Sound Scientific approach:
Approve/continue project with revision
2. Achievable goals/objectives:
Fair
3. Appropriate scope of activity to accomplish objectives:
Good
4. Potential for significant outputs(products) and outcomes and/or impacts:
Good
5. Overall technical merit:
Fair

Comments

The proposal touches on many key pests of the region, encompasses a broad range of biological control projects, and is multi-disciplinary. There is substantial evidence of previous success of this group. It is understood that this is ongoing work, but this reads more as a “report” than a “proposal”. While it is useful to briefly summarize what work has been done to provide the reasoning for future directions, most of the “word space” should be devoted to explaining what the researchers intend to do for this project period. The goals and planned work are quite vague. In assessing the four areas requested in the peer review form, I find myself “filling in the blanks” for the researchers – based on their previous work, it is likely that they have a sound scientific approach, achievable goals, an appropriate scope of activity to accomplish the objectives, and a potential for significant outputs and outcomes. However, they are not providing me with much of that information.

Specific comments:

Statement of Issues and Justification - This section would benefit from an explicit statement of why the multi-state project in particular is needed (as opposed to biological control in general).

To address this comment, we have added the following language to the opening paragraph: “This multi-state Hatch project fosters collaboration across a range pests to support efforts in releasing and monitoring biological control agents and to understand

how abiotic and biotic environments influences population dynamics and efficacy of biocontrol agents, and provides opportunities for participants to meet and discuss emerging issues to foster further collaborations”

Objectives

Because the four objectives are VERY broad, it would be helpful for the main goals of each project to be stated either here in the comments or in the methods.

Compared to the other three objectives, Objective 1's "comments" section is very vague and does not quite match the description later in the methods, where effects of exotic species are also mentioned.

We have revised the Objective title to remove the exotic species because this is not the focus of Objective 1

Methods – General

Very little detail provided throughout, making it challenging to assess the technical merit of the project. In many cases, it appears to just be a description of past work instead of proposed work and makes it difficult to assess feasibility or determine what is planned for this five-year period. Obj. 1 is particularly lacking in detail (with the exception of the Paragraph 2 project), so I have provided additional feedback on that section.

Methods - Objective 1

The methods of Obj. 1 would benefit from more detail about ongoing work so that the “next steps” outlined make more sense to the reader. Much of the methods for this section (Paragraphs 3-5) reads as a list of ongoing work without articulating what will be done for this project – more of the same (if so briefly describe) or what specifically in the ongoing work needs further investigation/what’s the new direction? (The other paragraphs need to be more like Paragraph 2)

The tenses of these paragraphs are now in the future to reflect that this is new and future work.

“Natural ecosystems are under evaluation at Cornell where the inter-relationships among introduced plants, deer, earthworms, salamanders, and slugs are studied in long-term plots with various manipulations (Gorchov et al. 2021).” - It is particularly unclear how this fits in with the rest of the project/biocontrol and what the manipulations are (even a brief summary, or a “highlights” list) would be useful here.

This section has been expanded to increase clarity in the experimental treatments and moved to Objective 3 where it is a better fit.

I realize that space is limited in this proposal, but I have a better sense of the planned work for the other objectives compared to this one. Removing the first paragraph and focusing on briefly describing each planned project would be more helpful. Some minimal detail on target crops and main pests for each project would provide better

context for the work. The paragraph regarding the Christmas tree farm/perennial habitat manipulations does the best job in this section of explaining the proposed research. However, the last sentence in this paragraph appears to have been truncated (ends with “and some”).

We have reduced the opening paragraph to an introductory sentence. The Christmas tree paragraph has been edited to remove truncation.

Outputs

Much of what is listed in the outputs section is previous outputs. While this does provide evidence that this group has been highly successful, this section should include more detail about anticipated outputs. Most of the previous outputs in roughly the first half of this section are >10 years old. There is also mention of a new book “to be printed in 2013” – is this a typo for 2023? While the numbers of biocontrol agents released (and where) is a useful output list (but again – what are the output goals for this proposal?), many of the items listed at the end of this section are outcomes (grower adoption, BCA spread), not outputs.

We’ve removed the list of previous outputs of this multi-state working group from the proposal.

Outcomes or Projected Impacts

In this section, it would be useful to have more specific projected impacts for some of the objectives. While it is helpful to see past outcomes, I would rather these be used to as evidence of likely projected impacts. For example, briefly state the previous success for each objective and then the likely future outcomes for this five-year renewal.

We have clarified the expected impacts for each objective in separate sections, and have expanded the outputs.

Outreach plan – it is unclear if an outreach plan is a required part of this proposal, but it is missing.

We do not have an outreach plan as part of this proposal because it is not required.

Your Recommendation:

Approve/continue project with revision

REVIEW 3

Rate the technical merit of the project:

1. Sound Scientific approach:
Approve/continue project with revision
 2. Achievable goals/objectives:
Excellent
 3. Appropriate scope of activity to accomplish objectives:
Fair
 4. Potential for significant outputs(products) and outcomes and/or impacts:
Excellent
 5. Overall technical merit:
Good
- Comments
The method part, especially on biological control of weeds, needs detailed information on how these experiments will be conducted (Researchers, locations, experiment design, and measurements etc.).

We have added institutions that are conducting work and included more information about experiment design where it was missing in the methods.

Your Recommendation:
Approve/continue project with revision

Appendix G: Peer Review (Submitted) Status: Complete

REVIEW 4

Rate the technical merit of the project:

1. Sound Scientific approach: Approve/continue project
 2. Achievable goals/objectives: Good
 3. Appropriate scope of activity to accomplish objectives:
Good
 4. Potential for significant outputs(products) and outcomes and/or impacts:
Good
 5. Overall technical merit:
Excellent
- Comments
This multi-state project aims to enhance biological control in agriculture through a comprehensive approach. It prioritizes the conservation of existing natural enemies by rigorously assessing their populations and understanding the impact of insecticides. Deliberate habitat manipulation, including native perennial planting, safeguards these beneficial organisms across various agricultural sectors like blueberries, field crops, and Christmas tree production. This holistic strategy minimizes risks to natural enemies,

establishing the groundwork for future biological control efforts, including augmentation and classical biological control. Augmentation programs involve repeated rearing and release of natural enemies to manage pests such as the European corn borer, root aphids in Christmas trees, and western flower thrips in ornamental greenhouse production. Additionally, the project explores introducing new natural enemies to combat invasive plants and insects, offering effective control measures for agriculture and ecosystems. This project, performed by entomologists in the land-grant system, promises to bolster U.S. agriculture with rigorous scientific foundations, potentially leading to valuable publications.

Limitations:

- Conducting research, rearing natural enemies, and monitoring their impact may not be feasible in all agricultural or ecological contexts.
- Thorough evaluation of unintended consequences when introducing new natural enemies is crucial. These introduced species may harm non-target species or disrupt existing ecological relationships, potentially causing ecological imbalances.

We are evaluating these through multiple programs in collaboration with the USDA etc. For example, for *Phragmites australis*, the team at Cornell will address USA/APHIDS concerns over host-specificity in the proposed biological control agents.

- Climate change can disrupt the distribution and behavior of pests and natural enemies, posing challenges in predicting and effectively managing pest outbreaks.

This is a concern, but currently outside the scope of our proposal. However, by assessing the ecology of natural enemies, we may be able to provide future insight on the intersection of climate change and biological control.

Your Recommendation: Approve/continue project

REVIEW 5

Rate the technical merit of the project:

1. Sound Scientific approach: Approve/continue project
 2. Achievable goals/objectives: Good
 3. Appropriate scope of activity to accomplish objectives:
Excellent
 4. Potential for significant outputs(products) and outcomes and/or impacts:
Excellent
 5. Overall technical merit:
Excellent
- Comments

This biological control working group/collaboration is of critical importance for addressing the impacts of invasive plant and animal species in the Northeast. This summary describes a range of ongoing cooperative efforts to identify, develop biologically based methods for control, and assess outcomes. While I understand that the 'pieces' of this summary were contributed by many authors, a better editorial effort was needed to provide more coherency between objectives and methods, as well as correct grammatical mistakes and typological errors. This will be especially important before being reviewed by political or funding entities.

We have revised the proposal and have addressed typos and coherence between sections.

Your Recommendation:

Approve/continue project