

Mexican Thorn Project – *Evippe* moth consultation meeting note

Date: 01 June 2023

Attendance:

Alan Nichols, Kyla Benjamin, Laura Shearer, Kerry Benjamin, Simon Minshull, Chrisna Visser, Diane Baum, Tiffany Simpson

General:

Comments raised at this meeting will be included in the formal Government Response document and will be included as part of the public consultation AIG has conducted on the potential release of the *Evippe* moth as a biocontrol agent for Mexican thorn. The Government Response document produced following the consultation will include comments captured from informal discussions, social media, public meetings, and emails during the consultation period.

Project updates:

CV provided a summary of the project aims and progress updates to the Council. The project will provide recommendations for an Integrated Control Plan for organisations on Ascension Island that deal with Mexican thorn during their work operations. The plan will include chemical, mechanical, and potentially biological methods. CV also explained the lifecycle of the *Evippe* moth and how it works as a biocontrol agent.

Risk assessment for the release of *Evippe* on Ascension:

DB explained that the Risk Assessment is being conducted with the assistance of the Centre for Agriculture and Bioscience International (CABI) using a template produced by DEFRA through an EU-funded Project. There are three main elements considered in the risk assessment: 1. What is the risk of the moth affecting Ascension's biodiversity and community? 2. What would be the impact of a reduction in Mexican thorn cover? 3. How likely is it that the moth will become established and reduce Mexican thorn cover?

1. What is the risk of the moth affecting Ascension's biodiversity and community?

In order to assess the potential impact of the *Evippe* moth on plant species other than Mexican thorn, host range testing has been carried out to see what impact the moth has on other plants. Extensive host range testing was carried out in Australia and South Africa ahead of *Evippe* releases in these countries. Ascension has used the results of these tests and commissioned tests of Ascension species at the CABI quarantine facilities in the UK. The plant list from Ascension included endemic ferns, the Ascension spurge, hedgehog grass, and introduced plants such as yellow boy, guava, raspberry, and tamarind. Throughout this extensive testing, the *Evippe* moth only affected Mexican thorn, very closely related species, and horse tamarind. During host range testing done in Australia, *Evippe* completed its first instar stage and initial leaf-mining on the horse tamarind but did not complete its lifecycle on this. No signs of leaf-mining occurred when horse tamarind grown from Ascension seed was tested by CABI. The moth had no effect on any other species of plant tested.

LS asked if the host range testing was conducted on mature Ascension plants. CV confirmed that the ferns and grass displayed adult morphology and the Ascension spurge was flowering during the testing.

AN expressed his concern that the Project may not have tested enough plants. DB explained that the testing of *Evippe* included a very broad range of plants and the moth only ever targeted Mexican thorn or very closely related species. This is typical for leaf-tying moths that evolve to be very specialised to their particular host.

KB asked what species of moth it is. DB stated the name of *Evippe* sp. #1, which was originally collected from Argentina then cultivated in Australia and South Africa. The moths used for Ascension's host range testing and any potential release on Ascension would come from cultures in South Africa that have been quarantined at CABI's UK facilities.

AN asked if the moth will evolve to feed on other things if Mexican thorn dies out. DB explains it is a very specialised and skilled moth that can only use Mexican thorn to feed and complete its lifecycle. If the amount of Mexican thorn decreases, then the moth will become less abundant as it is not able to switch to an alternative host.

AN asked if we are guaranteeing that the moth will not affect anything else. DB said on Ascension the moth would only affect Mexican thorn and potentially horse tamarind.

LS asked about lettuce as it is designed to be palatable for human consumption and asked if it can be tested. DB explained that there are generalist and targeted species. The *Evippe* moth is so specialised in the way it feeds that it is very unlikely to have any impact on lettuce. DB agrees that similar species of lettuce are available in the UK and can be tested with the *Evippe* culture as long as it does lead to a requirement to test all plant species, which would be disproportionate.

AN asked how small the moth is. Can it get through fly screens? DB explained that the moth will become abundant on the island, but it will preferentially stay on the Mexican thorn and not be actively trying to get inside people's houses. It does not have a strong ability to fly, and it may be blown in by the wind.

KB asked if the moth will be protected if they would become a nuisance around houses. DB confirmed they would not be protected under legislation and that they can be killed if they should become a problem in houses and areas other than release sites.

AN asked if the moth will have any impact on endemic invertebrates and vertebrates.

The crabs would have less shade, but they evolved without Mexican thorn so they will go back to the conditions they are used to. The reduction of Mexican thorn will also diminish the impacts of rats and invasive ants on the crabs and other native invertebrates. LS asked if shade shelter mitigation can be provided for the land crabs. DB said if crabs seem to be suffering from desiccation this could be considered as a management intervention.

2. What would be the impact of a reduction in Mexican thorn cover?

KB asked if fewer trees will have a significant impact on Ascension's climate. DB said precipitation on Ascension is primarily the result of evaporation from the surrounding ocean rather than trees or other vegetation. A reduction in Mexican thorn cover is unlikely to affect the island's climate.

KB asked about soil erosion. DB explained that the trees will defoliate but maintain binding elements of the tree roots. It may cause areas to become bare over long timescales, but other plants may move in which will be easier to control with conventional methods. Over decades, the slopes may need to be reinforced with engineering solutions that can be targeted to give better and more reliable long-term protection from erosion. LS asked if other species will be planted in areas where Mexican thorn was removed. DB said there would be no active planting, but other plant species may move into areas vacated by Mexican thorn. Resources would be better used on engineering solutions that can be targeted more effectively. The aim of bringing in the *Evippe* moth is to weaken Mexican thorn to such an extent that clearance efforts will work more effectively and last longer. Any other plants moving into these open areas will be easier to control due to their plant population growth dynamics.

LS asked if any modelling or habitat mapping has been done to predict the spread of Mexican thorn trees with or without mechanical or chemical control methods. Fixed-point photographs going to the 1970s to show changes from 2006 to 2022 are available. JNCC will assist the Project with digital habitat mapping based on satellite images of Ascension, which can be repeated over time to see the impact of the moth following its release. Ongoing monitoring efforts will be maintained to document how the landscape is changing. A suggestion was made to share a social media post on Facebook showing how the landscape has changed from the 1970s till this year.

LS stated that the people of Ascension want greenery and enjoy the current situation. DB stated it was important to note that Mexican thorn was still in an expansion phase, and the trees will continue to spread if there is no intervention. This will put increasing pressure on infrastructure and resources required to clear the Mexican thorn. DB stated that after the release of the *Evippe* moth, the Mexican thorn trees would look very similar to how it appears during drought years.

LS asked if it was possible to quantify the resources expended on Mexican thorn control. DB said it had not been possible to get figures from organisations controlling Mexican thorn on Ascension, but they had expressed a desire for more efficient options.

SM asked if there are impacts on cleaning the air. DB explained that the trees suppress dust but have no impact on the air quality that we breathe. The trees will probably not suppress dust as well when defoliated, but will still secure the ground.

LS asked how donkeys and sheep will be affected by the decline of Mexican thorn. They eat the seedpods so there will be a slight reduction in available food sources.

LS asked if there is an increased fire risk and if Mexican thorn can be burned to produce charcoal. DB explained that charcoal production is a very time-consuming and costly effort that requires lots of biomass. A business permit will be considered, but the effort is too great for AIG to take on. DB added that the slightly elevated fire risk caused by a defoliation of Mexican thorn would be no greater than during drought periods. This would be balanced by the reduction in Mexican thorn spread that would allow long-term clearance around settlements and high-risk sites and the creation of firebreaks. The

defoliation of trees may pose a slight initial risk, but over time sustainable control of Mexican thorn would reduce fire risk.

LS said that there is a concern from the community that CABI is unfamiliar with Ascension's environment and wondered if they will visit the island. It was mentioned that Norbert Maczey (CABI) has been to Ascension several times and is very knowledgeable about OTs. CV is leading the production of the Risk Assessment, working closely with external partners to ensure it is appropriate for Ascension. The Risk Assessment will be available to the public once the consultation period closes as the consultation responses feed into the assessment.

AN asked why we are considering biological control rather than other control methods. CV explained the Project is working on mechanical and chemical controls to integrate with biological control. The Project is also hoping to get funding through a Darwin Local bid for an herbicide spray drone to use in areas that are difficult to reach by vehicle or foot.

AN stated that there is no option to recall the moth if things go wrong. DB said that is why there is such a strong Risk Assessment process to foresee negative impacts and put mitigations in place.

LS asked about examples of biological control from St Helena. Consultation with the St Helena Government Biocontrol Team suggested there are no examples of biological agents that have had harmful, non-target impacts. Suggestions had been made that a worm released to control prickly pear had damaged garden plants on St Helena, but the *Cactoblastis* caterpillar released on St Helena is very specific to cactus and there are no records of it spreading to other species. Army worms were mentioned as a damaging biocontrol release. Army worms are present on St Helena but were probably introduced accidentally. Parasitic wasps were introduced as a biocontrol agent in an attempt to control the army worm infestation. These don't seem to have significantly reduced the population, but neither have they done any harm to non-target species.

LS asked if the release of the *Evippe* moth will have any impact on St Helena if it should spread there accidentally. DB said there are biosecurity controls in place in St Helena. If the moth should accidentally spread there is no Mexican thorn that could support the moth on St Helena, so it will die out.

AN asked if other biological control agents have been tried on Ascension previously. DB says yes. There is evidence of seed borers still present and having some impact on the Mexican thorn populations, but not enough to stop the spread.

3. How likely is it that the moth will become established and reduce Mexican thorn cover?

DB explained that it was important to remember that if the establishment of the *Evippe* moth is not successful, Ascension would be not be worse off than it is at present. Funding for the project is coming from the UK Government's Darwin Plus Programme, so no AIG resources would be expended on the attempt.

The temperature regime on Ascension would seem suitable for the moth based on the experience of Australia and South Africa, but humidity levels on Ascension may be higher than optimum. The lack of variation in day length on Ascension may be problematic as *Evippe* use increasing day length as a cue to end diapause.

Rodent and ant predators on Ascension may reduce *Evippe*'s likelihood of establishment. Rat bait and ant poison will be deployed around the *Evippe* release sites to reduce the impact of predators.

LS asked if the moth by itself would be enough or if we should add multiple biocontrol agents. DB said we are adding this agent to the current seed borer and sapsucker populations already released on Ascension. The development of new targeted biocontrol agents is very hard. We are adding to research already done, but do not have the resources to develop new agents on our own. At present, *Evippe* is the best 'off the shelf' biocontrol agent available for Mexican thorn.

AN asked if there have been any negative impacts of the *Evippe* moth recorded in Australia or in South Africa. The Project is trying to establish communications with the Pilbara Mesquite Management Committee with help from Rhodes University in South Africa. Thus far, these efforts have been unsuccessful. All papers published on this topic were released approximately 10 years after the release showing there have been no negative impacts in Australia at the 10-year mark. No published evidence is available beyond that timeframe. South Africa only released the *Evippe* moth in 2021, but no negative effects have been recorded over this short time period.

LS asked if there would be funding for long-term monitoring at AIG. DB says the establishment of good baselines is the starting point for long-term monitoring and that is part of the existing project. Future monitoring is difficult to plan at present because most available funding is on 3-year time scales. It is important to maintain links with Rhodes University in South Africa to provide guidance and possible support from students of the University. CV explained that the Project is developing a Monitoring and Evaluation Plan to guide long-term plans at each stage of the Project, especially from the introduction to the establishment of the moth. The mechanical and chemical control element of the Project will also feed into this M&E Plan.

Next steps and timeframes:

Actions	Timeline
Share a social media post on the historical changes in the landscape since Mexican thorns' introduction on Ascension.	09/06/2023
Read the article of Cheeseman (2006) – Biocontrol News and Information 27(1) 1N-26N to determine whether <i>A. prosopis</i> and <i>N. arizonensis</i> beetles changed their feeding habits to focus on Acacia species instead of Mexican thorn.	06/06/2023
Lettuce testing at CABI UK facility using varieties grown at AIG and Wolf Creek Hydroponics.	On-going
Presenting the <i>Evippe</i> consultation to AIG Operations Department and including their responses in the consultation.	02/06/2023
Publish the Government Response document and stand-alone parts of the Risk Assessment.	09/06/2023
Publish finalised Risk Assessment.	30/06/2023

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