Santa Maria (Azores) Invertebrate Planning Workshop Report

28th and 29th February 2020
Santa Maria Island
The Azores

Workshop organized by: The IUCN SSC Mid-Atlantic Island Invertebrate Specialist Group (MAIISG), IUCN SSC Conservation Planning Specialist Group and the Santa Maria Natural Park (Azorean Government).

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Executive Summary

A two-day workshop was held to plan for the conservation of Santa Maria's endemic invertebrates (Mollusca and Arthropoda); this has resulted in a series of outputs that can be used to form a final plan/strategy for the island. A number of recommendations are provided to support the development of these documents.

The threat tables from the workshop are broadly summarised and full results are presented in the Appendices. This report summarises what was achieved within the workshop, in terms of initial development of the Vision and Goals and Actions that will contribute to the conservation of the forty-three invertebrate species endemic to the island. The actions focus on improving the quality and quantity of suitable habitat for the species, rather than addressing any species-specific needs. For the action tables there are a number of key gaps to be filled particularly for forestry and agriculture, that have a number of goals without actions; and often the wording of individual actions present in all the threat themes need some more work to give clarity and to improve their SMARTness. These edits will be made within the production of the final plan/strategy for the island.

Background

This workshop was initiated by the IUCN's Mid-Atlantic Island Invertebrate Specialist Group (MAIISG) on the basis of the previous Red Listing results, high levels of invertebrate endemism and opportunities for projects on Santa Maria Island in the Azores. The process was led by Prof. Paulo A.V. Borges and Prof. António Frias Martins (under the activities of the project AZORESBIOPORTAL; ACORES-01-0145-FEDER-000072). They were supported by the MAIISG co-chair Vicky Wilkins, in partnership with Santa Maria Natural Park the Azorean Government (Direção Regional do Ambiente) represented by Nelson Moura and Rita Câmara and with advice and facilitation support from Jamie Copsey from the IUCN SSC's Conservation Planning Specialist Group (CPSG). The final conservation plan will primarily support the conservation and recovery of 43 threatened invertebrate species (**Table 1**), as well as improving habitat for other endemic wildlife of the island.

Table 1. The 43 species of endemic invertebrate focused on within the planning workshop (note that the mollusc statuses are estimates, as the existing statuses were out of date).

ORDER	NAME	IUCN Status (est. revision)
Araneae	*Canariphantes relictus*	CR
Hemiptera	*Aphrodes hamiltoni*	EN
Coleoptera	*Sphaericus velhocabrali*	CR
Coleoptera	*Cedrorum azoricus*	EN
Coleoptera	*Olisthopus inclavatus*	CR
Coleoptera	*Crotchiella brachyptera*	EN
Coleoptera	*Atlantocis gillerforsi*	EN
Coleoptera	*Caulotrupis parvus*	CR
Coleoptera	*Brachypera multifida*	CR
Coleoptera	*Athous pomboi*	CR
Coleoptera	*Cryptolestes azoricus*	CR
Coleoptera	*Catops velhocabrali*	CR
Coleoptera	*Tarphius depressus*	CR
Coleoptera	*Tarphius pomboi*	CR
Coleoptera	*Tarphius rufonodulosus*	CR
Coleoptera	*Tarphius serranoi*	CR
Lepidoptera	*Brachmia infuscatella*	EN
Lepidoptera	*Scoparia carvalhoi*	VU
Hemiptera	*Cixius azomariae*	EN
Mollusca	*Leiostyla tesselata*	DD (CR PE)
Mollusca	*Oxychilus (?) micromphalus*	NE (CR PE)
Mollusca	*Azorivitrina angulosa*	NE (CR PE)
Mollusca	*Oxychilus (D.) agostinhoi*	VU (CR)
Mollusca	*Oxychilus (D.) brincki*	NE (VU)

Mollusca	*Oxychilus (?) lineolatus*	VU
Mollusca	*Oxychilus (A.) spectabilis*	NE (VU)
Mollusca	*Oxychilus (D) viridescens*	NE (VU)
Mollusca	*Oxychilus (?) andrei*	NE (VU)
Mollusca	*Oxychilus (?) melanoides*	NE (VU)
Mollusca	*Azorivitrina brevispira*	NE (VU)
Mollusca	*Azorivitrina pelagica*	NE (VU)
Mollusca	*Leptaxis minor*	EN (VU)
Mollusca	*Leptaxis sanctaemariae*	LC (VU)
Mollusca	*Napaeus hartungi*	LC
Mollusca	*Napaeus tremulans*	LC
Mollusca	*Moreletina obruta*	VU (LC)
Mollusca	*Lauria fasciolata*	LC
Mollusca	*Leiostyla fuscidula*	DD (LC)
Mollusca	*Acanthinula azorica*	LC
Mollusca	*Spermodea monas*	LC
Mollusca	*Punctum azoricum*	NE (LC)
Mollusca	*Craspedopoma hespericum*	NE (LC)
Mollusca	*Ovatella vulcani*	NE (LC)

A core planning team developed the workshop process during a series of remote calls from July 2019 to the workshop in February 2020. This core group included: Paulo A.V. Borges (MAIISG/Azorean arthropod expert), Nelson Moura (Santa Maria Natural Park), António Frias Martins (MAIISG/Azorean mollusc expert), Vicky Wilkins (MAIISG Conservation Planning Rep) and Jamie Copsey (CPSG). The workshop was defined as being a two-day event, dictated by the reality of being able to gather island-wide stakeholders in relation to their other commitments.

Pre-workshop: Threat Analysis and Knowledge Review

Prior to the workshop CPSG created a threat matrix using the arthropod IUCN red list assessments[1] in order to identify synergies between the species and to check that this group of species would facilitate a multispecies approach. Due to the relatively small size of the island, the nature of the remaining habitat and its management structure a full island endemic approach including all species was adopted. The matrix was useful in terms of its analysis of groupings and it was obvious that some threats groupings were very clear. These groupings were used to define the working groups that were to be developed for the face-to-face workshop. The threat themes that were identified were:

- *Agriculture*
- *Forestry*
- *Invasive plants*
- *Tourism*

The matrix also identified climate change as a threat. As there was insufficient expertise on climate change impacts within Santa Maria, and as funding limited the number of external participants that could be invited, climate change impacts were considered as they arose within each of the four working groups outlined above[2].

Prior to the workshop a knowledge review analysis of the 43 species was developed[3]. This analysis provided details on all 43 species plus summaries of habitats, existing conservation measures, as well as the threat analysis tables plus species distribution maps that were developed. These maps and tables are presented within this report.

Multispecies approach and mapped distributions

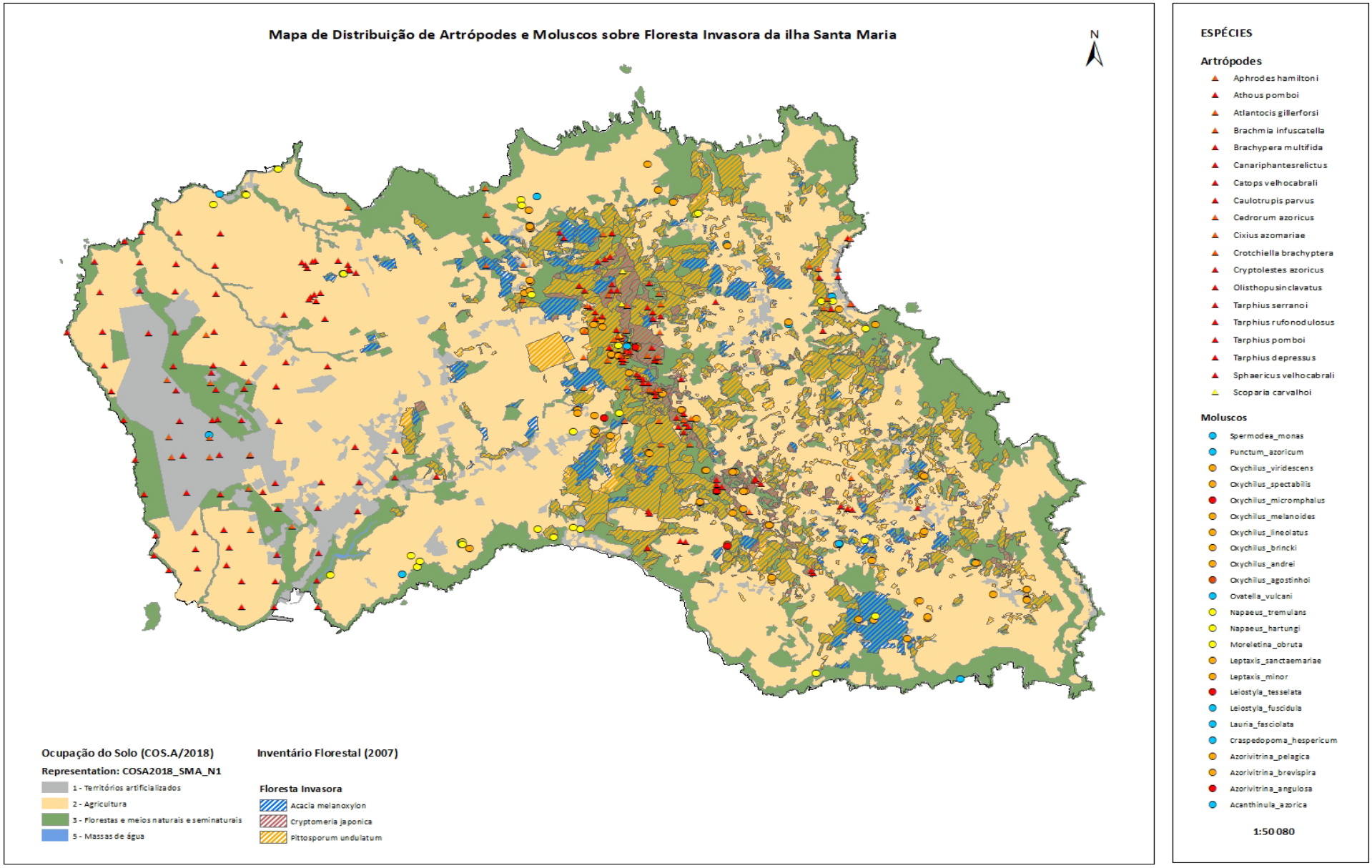
Of the total of 43 endemic invertebrate species identified, 30 were single island endemics and 13 species were Azorean multi-island endemics. Many of these endemic species are restricted to the

[1] A similar assessment was not possible for the mollusc species, as their assessments were out of date. Instead expert opinion from Prof. António Frias Martins was used to identify priority threats to the species.
[2] This approach did limit the depth of discussion around the threat of climate change. A point which is addressed within post-workshop actions.
[3] *Santa Maria Invertebrate Planning Workshop- Santa Maria Species Knowledge Review* (2020). Paulo A. V. Borges, António Frias Martins, Nelson Moura, Rosalina Gabriel, Vicky Kindemba & Jamie Copsey

high elevation mountain area of Pico Alto on Santa Maria, while other species are scattered in the fragmented pockets of habitat and within extensive agriculture areas (**Map 1**). It is likely that many of these historic records (over 20 years old) are now extinct due to habitat loss and degradation[4].

Whether each species is a single island endemic or not, in combination with their threat status and habitat considerations, all contribute to the identification of target locations for the delivery of conservation measures. Also, when interpreting spatial species data this needs to be done in conjunction with endemic plants/habitat, fragmentation and suitability (size, access and long-term management ability) for the restoration/creation native habitat, as well as other conservation actions and pressures.

[4] See Terzopoulou, S., Rigal, F., Whittaker, R.J., **Borges, P.A.V.** & Triantis, K.A. (2015). Drivers of extinction: the case of Azorean beetles. *Biology Letters*, **11**: 1-4; and Matyins, 2017. New species of umbilicated Oxychilus (Gastropoda: Pulmonata: Oxychilidae) from Santa Maria, Açores. *Açoreana*, 11(1): 41-57.



Map 1: Distribution of molluscs and arthropod species (including historic records) in relation to land-use, invasive plant species and remaining areas of endemic plants

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Multi-species Conservation Planning workshop

Attendees, workshop agenda and content

A total of 37 stakeholders attended the event (excluding facilitators) representing a wide range of organisations and interests from Santa Maria (**Table 2**).

Table 2. Workshop attendees (*attendees were facilitators and organisers of the workshop). Columns represent the days attended by each participant.

Name of participant	Stakeholder group	Friday	Saturday
1. Aníbal Cabral	Farmer	No	Yes
2. António Frias Martins	Associação Afonso Chaves	Yes	Yes
3. António Monteiro	Association LPAZ	Yes	Yes
4. Bárbara Chaves	Azorean Member of Parliament	Yes	No
5. Bruno Coelho	Forest owner	No	No
6. Bruno Melo	Farmer	Yes	No
7. Cristina Câmara	City Hall Vila Porto	Yes	Yes
8. Cristina Rodrigues	Farmer	Yes	No
9. Dinarte Teixeira*	Natural Park of Madeira Island	Yes	Yes
10. Duarte Moreira	Agriculture Association	Yes	Yes
11. Elisa Sousa	Azorean Member of Parliament	Yes	No
12. Fernando Silva*	*No Affiliation*	Yes	Yes
13. Hélder Resendes	Farmer	No	Yes
14. Henrique Simões	Tourist Guide	Yes	Yes
15. Hugo Carvalho	AZPEDAL (Tourism and Sports)	Yes	Yes
16. Ioannis Rousseoux	Tourist Guide	Yes	No
17. Isidro Sousa	Farmer/ Parish member	Yes	No
18. Jamie Copsey*	IUCN	Yes	Yes
19. Jaime Bairos	Santa Maria Natural Park	No	No
20. Joana Pombo	Santa Maria Natural Park	Yes	Yes
21. João Resendes	Farmer	Yes	No
22. Jorge Botelho	Tourist Guide	No	No
23. Jorge Santos	S. Pedro Parish	Yes	No
24. José Melo	Association Cadep	Yes	Yes
25. José Moura	Farmer	Yes	No
26. Marco Carvalho	President Almagreira Parish	Yes	No

27. Marco Pacheco Carvalho	Tourist Guide	Yes	Yes
28. Miguel Marques	Tourist Guide	No	Yes
29. Nelson Moura*	Santa Maria Natural Park	Yes	Yes
30. Paulo A.V. Borges*	University of Azores /Azorean Biodiversity Group	Yes	Yes
31. Paulo Pimentel	Regional Director of Nature Conservation	Yes	Yes
32. Raquel Guimarães*	Tourism activities	Yes	Yes
33. Ricardo Sousa	City Hall Vila Porto	No	No
34. Rita Câmara	Director Santa Maria Natural Park	Yes	Yes
35. Rita Pinto	Agriculture Services of S. Maria	Yes	Yes
36. Rita Santiago	Tourist Guide	Yes	No
37. Rosalina Gabriel*	University of Azores /Azorean Biodiversity Group	Yes	Yes
38. Rui Forte	Veterinary	No	Yes
39. Sérgio Sousa	Forestry Owner	No	No
40. Sofia Freitas	Santa Maria Natural Park	Yes	Yes
41. Susana Cabral	Environmental Education	Yes	Yes
42. Steven Figueiredo	Forestry Services	Yes	Yes
43. Vera Terra	Tourist Guide	No	No
44. Vicky Wilkins	IUCN	Yes	Yes
45. Vitor Freitas	Farmer	Yes	Yes

The majority of workshop attendees had limited understanding of invertebrates and their needs. Therefore, the workshop agenda sessions (**Figure 1**) were structured around threat themes in relation to native habitat restoration and threat management, of which there was greater, general understanding. In addition, both factors are key to the recovery of the endemic invertebrates that are represented mostly within the remaining native habitat. At the beginning of the workshop the endemic invertebrates of Santa Maria and their threats were introduced, and the distribution maps were used to highlight key areas for these species.

Figure 1. Workshop agenda

Agenda Friday 28th February 2020	
Time	**Activity**
9:00	Arrival & registration
9:30	Welcome
9:45	Workshop process overview
10:00	Presentation: Arthropods of Santa Maria - Paulo A. V. Borges
10:20	Presentation: Molluscs of Santa Maria – António Frias Martins
10:40	BREAK
11:00	Presentation: Presenting island history (António Monteiro), threats and maps (Nelson Moura); and introduction to threat review session – *Exploring the threats and drivers to Santa Maria's endemic invertebrates*
11:40	Group Work: threat review: Deepening our understanding of threats
13:00	LUNCH
14:30	Plenary feedback: threat analysis discussion
15:15	What could success look like? Developing a long-term vision for Santa Maria's endemic invertebrates
16:15	BREAK
16:30	Conservation goal development: Developing goals to mitigate threats
17:30	END
17:30 to 18:30	Visioning group to review and consolidate ideas for a draft vision statement

Agenda Saturday 29th February 2020	
Time	**Activity**
09:00	Welcome to Day 2: Recap and plan for the day
09:15	Update from the visioning
09:45	Goal development presentation
10:30	Presentation: Invertebrate perceptions on Azores – Rosalina Gabriel
10:45	BREAK
11:00	Actions/strategies session introduction
11:15	Action brainstorming
12:45	Plenary feedback session on action ideas
13:15	LUNCH (Visioning group – working ideas)
14:30	Action details – defining timescales, leads, resources etc.
15:30	Overview of workshop outcomes
16:15	Next steps in plan development: plan drafting, contacts, implementation etc.
16:35	Closing speech
16:45	END and coffee

Draft Vision

A plenary 30 year vision development session was facilitated during the first workshop day, followed by a focused session to refine the vision by a group of volunteers after the first day. The draft vision was then presented in plenary for feedback on the second day, resulting in the Preamble and Vision below (**Figure 2**). All notable comments from the recap session were integrated into the Vision text during the session. It was noted during the visioning session that further time needed to be spent on refining this draft vision statement (see recommendations section).

Figure 2. Draft vision statement developed during the workshop

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2050 Vision (draft)

Preamble: There is a recognised need for awareness of the heritage that we hold as an island, to accommodate its natural heritage and the need for the viability of a post-modern community that promotes freedom, diversity and tolerance.

Vision: in 2050, we will have the protected area for the management of habitats and species of the Pico Alto, re-naturalized and enlarged, with a reduction or total removal of invasive exotic flora and an increase in the population of endemic and native flora and fauna. A series of ecological corridors have been created to allow diversification of the landscape and increased biodiversity.

Throughout the island there is a balanced compatibility between nature conservation and economic activities, with responsible, conscious and sustainable tourism, multiple and dynamic uses of the forest and integrated agriculture that benefits from our natural heritage, providing animal welfare and facilitating the capture of atmospheric humidity and increasing the availability of water in the soil. Scientific knowledge and dissemination will have been increased, through the training of the population in the environmental terms, through environmental scientific tourism activities, and new forms of environmental and scientific dissemination and interpretation.

Threat analysis summaries

On the first workshop day working groups collated their understanding of the threats to the species' habitat, as well as some of the causes. They then prioritised threats based on a combination of the perceived level of impact(s) of each threat, and the ability of stakeholders to act on them (**Table 3** for summary; **Appendix I** for further details).

Table 3. Summary of threats identified within each them along with priority threats

Threat theme	Threats identified	Priority threats
Agriculture	1. Deforestation due to livestock pressures 2. Water shortage in agriculture due to native vegetation loss 3. Use of agro-chemicals 4. Invasive species impacts in agriculture areas 5. Soil loss and degradation due to native vegetation loss and damaging practices	Deforestation due to livestock pressures Water shortage in agriculture due to native vegetation loss
Invasive species	1. Conteira (*Hedychium gardnerarum*) 2. Incenso/areias (*Pittosporum undulatum*) 3. Silva (*Rubus ulmifolius*) 4. Acácia (*Acacia* spp.) 5. Cana (*Arundo donax*) 6. Mata vacas (*Lantana camara*) **7.** Trepadeira (*Ipomea indica*) 8. Tojo / Pica ratos (*Ulex europaeus*) 9. Chorão (*Carpobrotus edulis*) 10. Piteira / (*Agave americana*) 11. Figo da India/ Figo de toneira (*Ficus* sp.) 12. Control of invasive exotic entrances 13. Gardening / Nursery 14. Ornamental and agriculture plants 15. Hiking	Conteira (*Hedychium gardnerarum*) Incenso/areias (*Pittosporum undulatum*) Silva (*Rubus ulmifolius*) Acácia (*Acacia* spp.) Cana (*Arundo donax*) Mata vacas (*Lantana camara*) Trepadeira (*Ipomea indica*)

Forestry	1. Overlap between commercial and native forest areas 2. Lack of social recognition of native species 3. Chemical / physical effect of plantations on the soil (for example water from some species prevents other species grow) 4. Association of exotic/invasive species with forest culture 5. Propagation of sp. invasive by birds - great dispersal capacity of invasive species, absence of natural enemies 6. Low commercial interest of native species	Overlap between commercial and native forest areas Lack of social recognition of native species
Tourism	1. Mass tourism/sightseeing pressures 2. Infrastructure 3. Trail Run 4. Walking Trails (hiking) 5. Mountain biking activities 6. Motorised vehicle sports 7. Geocaching 8. Yachting	Mass tourism/sightseeing pressures Infrastructure

Goals

Following on from the threat session, the prioritised threats were used to write the goal statements within each working group (**Table 4**). The goal wording was modified at the end of the first day by the facilitators and then finalised by participants on day two. Suggested further additions are written red.

Table 4. Draft goal statements emerging from the working groups.

Agriculture

- Increase the native forest areas along watercourses, edges of agricultural properties and areas without agricultural use, to increase ecosystem services and livestock protection zones.
- Control invasive species in the native forest edges, for the economic and biodiversity enhancement of forests.
- Increase water retention in the native forest perimeter and the edges of agricultural exploitation, for the benefit of agriculture and adjacent ecosystems.
- Promotion of integrated protection in agricultural areas, for direct improvement of soil health and indirect health of farmers, promoting the potential increase in biodiversity.

Invasive species

- Decrease the populations of *Hedychium gardnerianum, Pittosporum undulatum, Rubus* sp. brambles and *Acacia* spp. in Pico Alto, to enhance the available area/habitat of invertebrates.
- Planting/regeneration of endemic plants in the Pico Alto area, to enhance the area/habitat available from invertebrates.
- Decrease the populations of *Hedychium gardnerianum, Pittosporum undulatum, Rubus* sp. brambles and *Acacia* spp., in buffer zones to enhance the available area/habitat of invertebrates.
- Planting/regeneration of endemic plants in the buffer zone at Pico Alto, to enhance the area/habitat available for invertebrates
- Creation of ecological corridors to connect patches of natural forest with Pico Alto area to increase the area/habitat available to invertebrates

Forestry

- Protect, manage and expand 'habitat pockets' of endemic species existing outside the Santa Maria Natural Park, in order to recover the natural heritage.
- Increase public understanding and awareness of endemic species, especially those on the island of Santa Maria, in order to protect species and ensure a better quality of life for people
- Environmental restoration of degraded forest areas to protect biodiversity

Tourism

- Minimize the impact of the new and use of existing tourism infrastructure to protect biodiversity
- Minimize the impact of tourist activities (sports and leisure in sensitive areas) to reduce impacts in sensitive areas

Action tables

Actions identified to achieve the goals are provided in **Appendix II**.

Recommendations

Given the limited time available for the workshop there were a number of activities that still need to be completed in order to prepare the content necessary for the strategic plan for the conservation of Santa Maria's invertebrates. Below are outlined a number of recommended steps that are taken to complete the work started within the workshop.

Recommendation 1: Building climate change into the plan

Although due to a lack of resources it was not possible to invite climate change experts to the planning workshop, it is recommended that the results of this workshop are shared with such experts to ensure that climate change, research and measures are considered and integrated where appropriate into the strategic plan resulting from this workshop.

Recommendation 2: Capitalising upon the species knowledge review

Highlights from the species knowledge review (produced in advance of the planning workshop) should be used in the introduction of the final strategy/plan, as well as referenced in the finalised document.

Recommendation 3: Revision of the distribution maps

The species distribution maps should be revised to more accurately represent the current distribution of species, taking into account the old age of some of the data points. In addition, ground trothing of certain data points is recommended before deciding exactly where to target conservation work.

Recommendation 4: Revisit the vision and goals to ensure integration of invertebrate needs

As a consequence of working groups focusing in on threats, and due to the general lack of understanding of individual species needs (beyond a small number of experts), the resultant vision and goals are directed towards habitat-based change. It is recommended that the vision be revisited to ensure that invertebrates are appropriately represented, and that the goals be reviewed to ensure that they will meet species-specific needs (e.g. in terms of targeting conservation actions on areas harbouring important invertebrate populations. This process could happen as part of the strategy document development to follow this workshop report. In addition, it is recommended that- within the strategy- monitoring plans are integrated that use particular invertebrate species and invertebrate habitat as indicators of wider ecosystem health.

In relation to the vision it is also recommended that further editing is undertaken to refine it, potentially extracting or developing certain information into a 'long-term goal' that could sit under a more succinct visions statement. This work should be undertaken before the final strategy is produced and should involve a representative cross-section of stakeholder to ensure that it addresses their combined interests.

Recommendation 5: Completion of action tables

For each of the four thematic goal (concerning Agriculture, Forestry, Invasive plants, and Tourism) it is recommended that the actions tables be revisited to ensure that there is a clear relationship to the achievement of the relevant goals, and that the actions identified are Specific, Measurable, Achievable, Relevant and Timebound (SMART). Again this work can be completed in advance of preparing the conservation strategy document to follow.

Conclusions

The two-day workshop was a highly productive and unifying event bringing together- often for the first time- stakeholders who, through their activities, can significantly influence the long-term viability of the endemic invertebrates of Santa Maria. Although the general level of awareness of these invertebrates and their unique status was initially low, the outputs of the workshop demonstrated that people care about them and particularly care about the native habitat on which many of the species depend. There was a great openness to discuss and share concerns, needs and wants for the future and participants were able to generate a common vision of what this future might look like. Working groups developed important sets of goals and began to develop actions to satisfy these tangible measures of success.

Further work is now needed to complete the planning process, two-days being insufficient to achieve this given the different starting points of each stakeholder group. However, sufficient agreement around the desired change was achieved and, with some additional edits and detailing, in particular around the most appropriate actions to take, the current workshop report can be reformatted into a 10 year conservation strategy with a 30 year vision for the endemic invertebrates and their native habitat on Santa Maria Island, the Azores.

Appendices

The associated appendices contain the threat tables (some are in Portuguese), goals and actions tables for each of the four threat theme. The action tables were reformatted to provide consistency.

Threat analysis tables for agriculture, forestry, invasive plants and tourism.

Actividade 1: Tabela de análise das ameaças (Agriculture)

Actividade (ou ameaça individual)	**Esta actividade está a aumentar? Diminuir ou está estável?**	**Porque razão achamos que a actividade está a mudar desta forma?** (questões sociais, politicas, economicas ou outras?)	**Quão impactante esta actividade é relativamente aos invertebrados/seu habitat? (ELEVADO, MÉDIO, REDUZIDO)**
T.1.1 Lack of useful areas for livestock (bush is "cheaper" for those who do not have their own land) T.1.2 Deforestation and pressure on natural areas	Increase (since the EU financing started)	T.1 Economic: • Demand more income once EU support 60% of the farmers area • Lack of viable alternatives T.2 Social • lack of alternatives • Low schooling	T.1 Medium T.2 High
T.2 Exotic species introduction <u>T.2.1. Invasive plants</u> (e.g. Kahili Ginger Lily, *Hedychium gardnerianum*) - hinders conversion to pasture <u>T.2.2 New "herbs" introduction</u>: • (e.g. Lantana sp., kikuion grass *Pennisetum inclusum*), which are invading the pasture with danger to the "animals"	Increase (in all the subset)	**Social:** • Ignorance of the impact caused • Difficulty in law enforcement	High (in all subset)

T.2.3 Beekeeping: Introduction of pollinators that compete with resources			
T.3 Shortadge of water (Reduction of vegetation with ability to capture/retain water)	• Decreases the catchment area • Lack of water increases	**Economy** • Increase deforestation for introducing more livestock (more cattle) • Less rain, climate change	Medium
T4. Use of agrochemicals (Reduction of ecological / biological diversity) • Pesticides • Herbicides • Fertilizers	Increase (of usage)	**Economy** • Efficiency • Cost reduction	High
T.5 Soil mobilization (lack of respect for the current water lines orientation) **T.5.2 Lack of crop rotation** (depletion of soil nutrients, reduction of organic matter)	Increase (proportionally to pasture use) Stable	**Social** • Due to lack of information **Social/Economy** • Lack of areas available for turnover • Low crop diversity	High Low
Group Discussion: - Suggested legislation to favour the valuation of the existence of (native) shrub vegetation in the calculation of the useful area for subsidies - Choosing an agricultural or other activity depends on the subsidies allocated - Why not choose another type of economic activity other than livestock? (Livestock with more subsidies, more tax generation, more commercial activity…) - What does this land need to be sustainable in the future and not just more financially viable at the moment? There is no long-term strategy ... - There is no crop that will replace livestock, because it is the most profitable and most adjusted to the climate of the Azores. Suggests mixed pasture that allows conciliar com a floresta por exemplo			

Actividade 1: Tabela de análise das ameaças (Florestas)

Actividade (ou ameaça individual)	**Esta actividade está a aumentar? Diminuir ou está estável?**	**Porque razão achamos que a actividade está a mudar desta forma?** (questões sociais, políticas, económicas ou outras?)	**Quão impactante esta actividade é relativamente aos invertebrados/seu habitat? (ELEVADO, MÉDIO, REDUZIDO)**
Sobreposição entre as áreas de floresta comercial e de floresta nativa.	Diminuir	Interesse económico e politico: - envelhecimento das matas (criptoméria, eucalipto, acácia e pinheiro) e aspectos de sanidade - *Armillaria* (fungo) na Criptoméria (no envelhecimento, o pau branco está a nascer e crescer no meio delas) - Apoios à lavoura são maiores e origina mais áreas de pastagem. - Apoios reduzidos à florestal ou inexistente. Investimento a longo prazo Limitação de espaço efectivo da área da ilha - Conflito com a área urbana	A monocultura de plantação é pobre em biodiversidade, uma vez que não está a aumentar, criam-se possibilidades de renaturalização, com por exemplo *Picconia azorica*. Esta hipótese seria positiva para o habitat e desenvolvimento dos invertebrados. - A uva da serra é como a urze, necessita de luz para o seu crescimento. Elevado
Efeito químico/físico das plantações no solo (exemplo água do incenso não deixa crescer as outras spp	Aumentar	Aumento derivado da expansão das espécies invasoras, que são mais agressivas no seu crescimento e alteram o ph do solo, impedindo o crescimento de outras espécies.	Elevado (negativo) na qualidade do solo.
Associação de espécies exóticas (ex conteiras) à cultura florestal	Aumentam	Razões ecológicas (aumentam as espécies invasoras onde as matas estão a envelhecer)	Elevado negativo Sem conteira é que surgem novos exemplares de pau-branco
Propagação das sp. invasoras por aves (silvado, incenso, conteira)- grande capacidade	Aumentar	Razões ecológica : ciclo quanto mais há mais pode haver)	Elevado negativo

de dispersão das espécies invasoras, ausência de inimigos naturais			
Baixo interesse comercial das espécies autóctones / falta de reconhecimento social das espécies autóctones.	Igual ?	Baixo valor económico, mas madeira por razoes económicas e sociais. Razoes politicas porque não associam apoios monetários para as espécies autóctones.	Impacto elevado negativo porque os invertebrados são poucos interessados nas sp autóctones. **Nota de discussão:** - O cedro do mato desapareceu por uso excessivo para construção de construção. - Existem apoios para plantação de espécies lenhosas que não a criptoméria, e que são mais elevados que a criptoméria. - Não existem apoios ou planos de gestão para apoios par plantação de matas mistas, que dêem não só para comercial, mas também para florestação. - Existem já de momento, ensaios para cedros de mato, para criar o modelo florestal para plantação no futuro- para boas praticas da aplicação.

Actividade 1: Tabela de análise das ameaças (Invasive plants)

Actividade (ou ameaça individual)	**Esta actividade está a aumentar? Diminuir ou está estável?**	**Porque razão achamos que a actividade está a mudar desta forma?** (questões sociais, politicas, economicas ou outras?)	**Quão impactante esta actividade é relativamente aos invertebrados/seu habitat? (ELEVADO, MÉDIO, REDUZIDO)**
Conteira (*Hedychium gardnerarum)*	Increase	Very aggressive species. Adapted very well to the island's edaphoclimatic conditions.	High
Incenso/areias (*Pittosporum undulatum*)	Increase	Very aggressive species. Adapted very well to the island's edaphoclimatic conditions.	High
Mata vacas (*Lantana cambara*)	Increase	Very aggressive species. Adapted very well to the island's edaphoclimatic conditions.	High
Tojo / Pica ratos (*Ulex europaeus*)	Increase	Very aggressive species. Adapted very well to the island's edaphoclimatic conditions.	High
Cana (*Arundo donax*)	Increase	Very aggressive species. Adapted very well to the island's edaphoclimatic conditions. Decrease its use in agriculture	High
Chorão (*Carpobrotus edulis*)	Stable	Less used for ornamental purposes and land support	High
Silva (*Rubus ulmifolius*)	Increase	Increase of abandoned lands. Land abandonment	High
Acácia (*Acacia* spp)	Stable	Forest Clearing	Medium
Piteira / (*Agave americana*)	Stable	Less use for feeding cattle.	Low
Figo da India/ Figo de toneira (*Ficus* sp.)	Stable	Less aggressive. Few places with ideal conditions for the plant.	Low
Trepadeira (*Ipomea indica*)	Increase	Very aggressive species. It has adapted very well to the island's edaphoclimatic conditions. Abandonment of agricultural land / forest.	High
Control of invasive exotic entrances	?		
Gardening / Nursery	decreasing (greater	Greater control over economic activities;	High

	oversight of economic activities)	issuance of licenses by the DRA)	
Ornamental and agriculture plants	Increasing (associated with the lack of control at ports and airports)	Lack of entrance control	High
Hiking	Increasing	Increase of Tourism	Medium (???l)
Exotic animals	Increasing	Lack of entry control / climate change	High
Bacteria and other Microorganisms	?		
Fungi	?		
Population increase of certain species of birds (dispersion of seeds / propagators)	Increasing	Increase of foof	High

Discussion on the inclusion of Cryptomeria: the list. Paulo Pimentel refers that an invasive plant is a plant that propagates itself, not being the case of Cryptomeria, so it should not include the list. Paulo Borges says that between Cryptomeria forest and pasture, the former is more suitable for biodiversity, but it is still a poor forest that offers few conditions for both invertebrates and avifauna.

Discussion regarding the introduction of gardening and nursery activities in the list of threats, considering the risk of introducing invasive species. Considering that companies licensed for this purpose are previously licensed, Paulo Pimentel does not consider it to be a threat. It was considered that what is effectively a risk is the lack of control of species entry in ports and airports.

Actividade 1: Tabela de análise das ameaças (Turismo)

Actividade (ou ameaça individual)	**Esta actividade está a aumentar? Diminuir ou está estável?**	**Porque razão achamos que a actividade está a mudar desta forma?** (questões sociais, politicas, economicas ou outras?)	**Quão impactante esta actividade é relativamente aos invertebrados/seu habitat? (ELEVADO, MÉDIO, REDUZIDO)**
Trilhos Pedestres	Aumento	- Aumento da visibilidade dos Acores como destino de natureza, fazendo parte de estrategia económica regional. - Aumento de procura interna e externa.	Medio (aproveitaram-se os caminos antigos que nao necessitaram de grandes intervencoes). No entanto, pode existir dissiminacao de plantas invasoras porque mais pessoas caminham pelos trilhos.
Turismo Massa .Sight seeing	Aumento	- Acores na Moda 'Trend' - Lowcost (viagens aéreas a baixo custo)	Elevado Diferenca entre trilhos pedestres e turismo esta relacionado com a quantidade de pessoas e com nivel de consciencia ambiental dos visitantes. Enquanto que nos trilhos pedestres esta mais vocacionado para pessoas com maior consciencia ambiental, o turismo de massas esta relacionado com pessoas com menor consciencia ambiental.
Infraestruturas (apoio turismo, casas rurais, hoteis)	Aumento	- Politica de incentivo - Lobby construcao	Elevado
BTT	Estavel	- Falta de incentivo (estrategia, acessibilidades, equipamento) - Falta de divulgacao	Medio
Trail Run	Aumento	- Promocao (estrategia) - Procura interna - 'Trend'	Medio a Elevado
TT (veiculos motorizados)	Estavel	- Censura social – Esta muito asociado a pratica dentro das áreas	Reduzido

		protegidas, por isso a censura social. - Disponibilidade financeira (desporto caro) - Dimunuicao de caminhos para pratica de TT.	
Iatismo	Aumento	- Estrategia económica (Marinas com condicoes) - Incremento de tecnología de inovacao.	Reduzido
Geocaching	Diminuicao	- Deixou de estar na moda	Reduzido (a pesar do uso do plástico para guardar o material).
Todas as atividades estao relacionadas com o Pico Alto			

Threat prioritisation tables towards the development of goals for agriculture, forestry, invasive plants and tourism.

Activity 2: Goals development- Agricultura (Part 1)

Actividade (ou ameaça individual)	**Impacto nos habitats/espécies? (ELEVADO, MÉDIO, REDUZIDO)**	**Qual é a nossa capacidade para modificar esta actividade? (ELEVADA, MÉDIA, REDUZIDA)**	**Actividades prioritárias a serem modificadas** (utilizar autocolantes com estrelas ou método alternativo)
T.1 Forest clearance (due to lack of useful area for agricultural activities)	High	**Medium:** - Adaptation of EU law/creation of new legislation - Create specific regional measures - Cultural issue “Let's clear up” - Reinforcement of awareness of farmers and the general population	13 stars (of highest importante)
T.2 Exotic species introduction		**High:** - Legislation in place - Reinforcement of the application of the law	2 stars
T.3 Shortage of water		Medium	8 stars
T.4 Agrochemicals		Medium	3 stars
T.5 Soil mobilization		Reduce	0 stars

Activity 2: Goals development- Agricultura (Part 2)

Actividade prioritária a modificar (relativa à tabela anterior)	**O que iremos mudar?**	**Onde iremos mudar? (se relevante)**	**Porque iremos mudar/ que diferença julgamos que irá fazer?**
T1. Forest clearence	Increase the forest area	In topographically not favourable areas for agriculture (without use for) in Sta. Maria, namely: • Salto • Farrobo • Feteiras-Barreiro On limits of agricultural properties Along the water lines	• Will help with water retention • Increase the nutrients availability on the soil • Crease potential habitat areas for the invertebrates and other species • Create shade and wind protection for animals in agricultural fields.
T2. Exotic species introduction	Invasive species control	In the Forest perimeter of *Cryptomeria japonica* In *Hedychium gardnerianum* and *Pittorporum undulatum* areas	Economic valuation of the forest area • Create space for native plants and others of commercial value
T3. Water shortage	Increase soil water holding capacity	In forest areas and others in the vicinity of agricultural fields.	Increased water retention capacity in the soil, making it available for consumption Beneficial for agriculture, ecosystems and habitats (biodiversity, public consumption)
T4. Agrochemicals	Promotion of integrated protection	Agricultural areas	Indirect improvement of Public health Improvement Land/soil health Increased of Biodiversity
Group Discussion: Invertebrates do not bring money ... Everyone has to lose a little bit (prune the native ones instead of the cut) Clearance in certain places should be limited, but whoever is not allowed to clear on their land must be compensated.			

Actividade 2: Desenvolvimento dos objectivos- Florestas (Parte 1)

Actividade (ou ameaça individual)	**Impacto nos habitats/espécies? (ELEVADO, MÉDIO, REDUZIDO)**	**Qual é a nossa capacidade para modificar esta actividade? (ELEVADA, MÉDIA, REDUZIDA)**	**Actividades prioritárias a serem modificadas** (utilizar autocolantes com estrelas ou método alternativo)
Sobreposição entre as áreas de floresta comercial e de floresta nativa.	Elevado	Média	1. Investir nos planos de ordenamento do território e fiscalização. 2. Criar parcelas para as áreas de floresta comercial e nativa 3. Identificar as zonas com potencial para florestal nativa na ilha 4. Promover (projectar, plantar material genético local) condições para renaturalização dessas áreas a partir das bolsas endémicas. Encontrar financiamento meios e recursos. 5. Aquisição das zonas de bolsas de endémicas.
Falta de reconhecimento social das espécies autóctones.	Elevado	Média	1. Limitar a importação de exóticas 2. Promover, continuar a oferta de autóctones a grupos e associações 3. Dar visibilidade simbólica às espécies autóctones sobretudo das espécies endémicas de Santa Maria

Actividade 2: Desenvolvimento dos objectivos- Florestas (Parte 2)

Actividade prioritária a modificar (relativa à tabela anterior)	**O que iremos mudar?**	**Onde iremos mudar? (se relevante)**	**Porque iremos mudar/ que diferença julgamos que irá fazer?**
Sobreposição entre as áreas de floresta comercial e de floresta nativa.	Proteger Bolsas de Endémicas Limpar as espécies invasoras mas evitar a erosão Proteger o solo com outras plantas (replantar)	Zonas fora das zonas protegidas **Proteger Bolsas de Endémicas** Piedade: Urzes Almagreira: Pau-branco Zona do Norte: urze e pau-branco Loran: Urze e pau-branco **Limpar as espécies invasoras mas evitar a erosão** Pico Alto: Conteira Zona da Piedade : Tojo Barreira da Faneca: Incenso	Recuperar o património endémico a partir do que resta, de modo a manter ou aumentar a biodiversidade autóctone. Limitar a expansão das espécies exóticas existentes Criar zonas tampão em redor das bolsas de endémicas
Falta de reconhecimento social das espécies autóctones.	Continuar o esforço para implementar a lei Consciência do valor do património cultural	Comunidade em geral (transversal a todos os sectores)	Alteração de mentalidades – aumentar a valorização das espécies endémicas Protecção das sp endémicas

Actividade 2: Desenvolvimento dos objectivos- Invasive plants (Parte 1)

Actividade (ou ameaça individual)	**Impacto nos habitats/espécies? (ELEVADO, MÉDIO, REDUZIDO)**	**Qual é a nossa capacidade para modificar esta actividade? (ELEVADA, MÉDIA, REDUZIDA)**	**Actividades prioritárias a serem modificadas** (utilizar autocolantes com estrelas ou método alternativo)
Hedychium, Pittosporum and Rubus	Elevated	Medium to Elevated	Hedychium, Pittosporum and Rubus
Hedychium, Pittosporum, Rubus and Acacia	Elevated	Medium to Elevated	Hedychium, Pittosporum, Rubus and Acacia
Pittosporum, Hedychium, Rubus, Cane, Lantana, Ipomea, Acacia	Medium to Elevated	Elevated	Pittosporum, Hedychium, Rubus, Cane, Lantana, Ipomea, Acacia

Activity 2: Development of Objectives- Invasive plants (Part 2)

Actividade prioritária a modificar (relativa à tabela anterior)	**O que iremos mudar?**	**Onde iremos mudar? (se relevante)**	**Porque iremos mudar/ que diferença julgamos que irá fazer?**
Hedychium, Pittosporum and Rubus	Reduce the population of invasive plant species; endemic planting – re-naturalisation	Surrounding the central zone of natural habitat where most invertebrates live - Pico Alto	Re-naturalise - increase the size of the invertebrate habitat
Hedychium, Pittosporum, Rubus and Acacia	Create ecological corridors; decrease the population of Hedychium, Pittosporum, Rubus and Acacia, plantation of endemics – re-naturalisation	Buffer zone surrounding Pico Alto	Increase landscape diversity; reduce the pressure exerted by the invaders on the central area of Pico Alto
Pittosporum, Hedychium, Rubus, Cane, Lantana, Ipomea, Acacia	Create an ecological corridor between the APGHE of Pico Alto and the APGHE Ponta do Castelo. plantation of endemics – re-naturalisation	Ecological corridors – Salto; Ribeira do Engenho and Casas velhas	Re=-naturalise - increase the size of the invertebrate habitat

Actividade 2: Desenvolvimento dos objectivos- Tourismo (Parte 1)

Actividade (ou ameaça individual)	**Impacto nos habitats/espécies? (ELEVADO, MÉDIO, REDUZIDO)**	**Qual é a nossa capacidade para modificar esta actividade? (ELEVADA, MÉDIA, REDUZIDA)**	**Actividades prioritárias a serem modificadas** (utilizar autocolantes com estrelas ou método alternativo)
Trilhos pedestres	ESTA COLUNA DEVERÁ TER SIDO CONCLUÍDA NA PRIMEIRA ACTIVIDADE	Elevada	5
Turismo de Massa		Reduzido	1
Infraestruturas		Media	2
BTT		Elevada	3
Trail Run		Elevada	4
TT		Reduzido	
Iatismo		Reduzido	
Geocaching		Reduzido	

Actividade 2: Desenvolvimento dos objectivos- Tourismo (Parte 2)

Actividade prioritária a modificar (relativa à tabela anterior)	**O que iremos mudar?**	**Onde iremos mudar? (se relevante)**	**Porque iremos mudar/ que diferença julgamos que irá fazer?**
Exemplo: *Dispersão das espécies invasoras s X, Y or Z*	*Reduzir a área coberta por esta espécie*	*Na envolvência da zona central de habitat natural onde a maioria dos invertebrados vivem*	*De forma a aumentar a disponibilidade de habitat natural para as espécies.*
Walking Trails (Hiking)	-Maximum loads (per day and in people per trail) - Identify sensitive / problematic areas	- - Local information on the spot and on arrival at the island. - - Tourist entertainment companies contributing to provide information.	- - Avoid trail degradation (biodiversity and geodiversity). - - Avoid soil erosion - - Extend the trail's state of life and ensure its sustainability.
Mass Tourism	- Maximum loads (per day and in people per Trail) - Access control with prior registration (just like in diving activities)	- Evaluation of places where there is a greater mass tourism or a greater influx of tourists, taking into account the capacity of the area and its need for preservation (Examples of places: Cascata do Aveiro, Barreiro da Faneca. If the future scenario is a Mass tourism will require access control, as well as registration.	- Avoid the impact of mass tourism in sensitive places - - Avoid trail degradation (biodiversity and geodiversity). - - Avoid soil erosion - - Extend the trail's state of life and ensure its sustainability.
Infrastructure	-Rules for construction -Facilitate rehabilitation to avoid new constructions. - Maintain typical Marian constructions. - If it is really necessary to build, assess the impact of infrastructure	PDM, POOC, POTRAA (in case it is necessary to change to facilitate the housing recovery, typical of the Marienses).	- -Integration - - Landscape coherence - - Preserve what belongs to us - 'If you built it, they will come'. - - Assess whether it will be necessary to rebuild or build from scratch, taking into account the pressure on the site to be preserved.

	on attracting people and pressure on the site. - IF YOU BUILT IT, THEY WILL COME.		
BTT	- Inclusive discussion - Stakeholders for the BTT entities and practitioners to give their opinion on the regulation (public participation).	Not applicable	- - Staring from Zero - There is no legislation on mountain biking; There is no regulated management of mountain biking activity. - • Inclusive debate covers all areas. Locals need to feel that they are part of their island's decisions. Subsequently, it will be necessary to regulate what is not yet properly legislated, always taking into account the opinion of the locals.
Trail Run	- Evaluation of the environmental impact of the event. - Create exclusion zones (more sensitive zones) and if necessary (for example, if they are nesting zones, zones with endemic species threatened). Also applicable to walking trails and mass tourism.	Sensitive areas of the island.	- - Avoid trail degradation (biodiversity and geodiversity). - - Avoid soil erosion - - Extend the trail's state of life and ensure its sustainability. - - Note: A sensitive area that is closed for a certain activity, does not mean that it is closed for another activity (e.g. a sensitive area closed during the trail run, it may be open on a pedestrian trail).
TT			- Reduced risk
Iatismo			- Reduced risk
Geocaching			- Reduced risk (It is important to eliminate plastic from protected areas. Try new reusable proposals).

Actions tables linked to goals for agriculture, forestry, invasive plants and tourism.

Actividade 3: Mapa mental de possíveis acções- Agricultura (para atingir cada objetivo)

Objectivo	**Principais idéias de acção** (o título amplo para grupos de idéias relacionados)	**Idéias de acção relacionadas**
O1. Increase the forest area along water lines, farm boundaries and areas without agricultural use to increase ecosystem services and livestock protection zones	1- Acquisition or public lease (program contract) of boundary land: • In water lines, vegetation necessary to be converted to protect, land not currently used for agriculture • Land expropriation/negotiation to move to public land 2.Amendment / Revision of the legislation: • To safeguard the shadow areas without loss of area subject to subsidy and there is an increase • Creation of benefits to those who have vegetation in the limits. 3. Creation and/or review of financial incentives for: • The creation of curtains to shelter land with the implementation of natural forests; • For the conversion of the agricultural parcel (incentive in order to obtain an income during a long-term period in which there is forest in the terrain) 4. Fostering the governmental program's	

	scope “plus endemic”, to support the endemic plantations with the agricultural land. 5. Creation of endemic nurseries to directly supply farmers. 6. Creation of small dams for water retention along the known water courses in the forest areas and in the vicinity off agricultural fields based on natural engineering.	
O2. Control invasive species in the forest perimeter of Santa Maria for economic enhancement of the forest	• Creation of incentives to replace invaders by endemic ones; • Extend PRECEFIAS program (invasive control program) • Promote the conversion of the Government lands (removal of invasive species and promote endemic plantation) • Exchange of public land for private land according to their soil use • Promote public awareness campaigns	
O3. Increase water retention in the forest perimeter and the limits of farms for the benefit of agricultural activities and adjacent ecosystems	Improve the water retention along water courses based on natural engineering and the construction of small dams	
O4. Promotion of integrated protection in agricultural areas for direct improvement of soil health and indirect health of farmers, promoting the potential increase in biodiversity	Training plan for technicians/farmers/ landowners More effective enforcement of legislation (increased enforcement)	

Activity 4: Action details table- Agricultura

Objectivo/Acção	Quem será responsável?	Quem / quais as organizações que ajudarão?	Quando será concluído?	Como saberemos que será implementado? (indicadores)	O que precisamos para garantir que conseguimos concluir a ação?
A1. -Acquisition of land -Rent	Secretariat of Environment of the Azores Government (SRA)	Municipality Local NGO's with land (Santa Casa da Misericórdia, Santíssimo) Private owners	3-5 years	Number of acquired land done Number of renting contracts done Number of land terrains obtain by SRA by administrative possession.	• Land tenure (unregistered/others); • LIFE project and/or other available financing mechanisms for habitat conservation/restoration
A2.**Hedges implementation** 2.1. Review of legislation: -for not penalizing the areas -for creating incentives 2.2. Endemic cord creation	2.1 SRA 2.2 Farmers Private	2.1 -SRA -ARCOA - Farmers association - Island Council 2.2 -ARCOA - Farmers association - Island Council - Directorate of Forests of	1 year (to ensure changes to the next framework program being negotiated)	2.1. Law approval and enforcement 2.2. Number of land intervened	2.1 • Dissemination of the project / conservation plan by GRA • Pressure from farmers/associations • Approval of the law 2.2 • Dissemination of the project / conservation plan by GRA • Pressure from farmers/associations • Approval of the law • LIFE project and/or funding mechanisms

		Azorean Government (DRF)			
3. **Creation of plant nurseries** (Reconversion/Requalification of existing infrastructure)	SRA	- Faial Botanical Garden Seed Bank -University of Azores (UAc) - DRF	2 years	No. of infrastructures created Number of plantings made available - removed (once it needs more time to obtain planting)	LIFE project and/or other available financing mechanisms for habitat conservation/restoration
4. **Creation of Small dams**	GRA Privados	- IROA S.A. - UAc - Laboratory of Civil Engineering of the Azores (LREC)	1 year	Nº of dams created	LIFE project and/or other available financing mechanisms for habitat conservation/restoration Political will Spatial planning and natural resources in place which shall include the suggested solution.

Actividade 3: Mapa mental de possíveis acções- Florestas (para atingir cada objetivo)
Essa atividade será realizada no flipchart com o título da meta no centro de uma página e as ideias do grupo de trabalho sendo adicionadas (pelo facilitador) em volta da meta central. No entanto, você pode registrar o mapa mental em algo como a tabela a seguir:

Objectivo	**Principais idéias de acção** (o título amplo para grupos de idéias relacionados)	**Idéias de acção relacionadas**
Protect the stock exchanges of endemic species that still exist outside the Santa Maria Natural Park, in order to recover the natural heritage	*- Identify the most promising "endemic pockets" for nature conservation* *- Characterize the pockets* *- (re) create the basic conditions to allow colonization by native / endemic species and their maintenance* *- Adapt legislation // regulations to ensure their protection*	***Identify the most promising "endemic pockets" for nature conservation*** *Synergy between the various entities with available resources (cartography, photography, drone, etc.)* *Use the county's parties and events to identify absent owners on the island.* *PDM revision and other IGTs if necessary.* ***Characterize the pockets*** *Involve public entities in characterizing the protection of land - public, private* *Involve the University of the Azores and public institutions in the area in the identification of species* ***re) creating the basic conditions to allow colonization by native and endemic species*** *Identify restoration measures - careful cleaning of invaders and introduction of some endemic ones.* *Enhance the appearance of endemic species that are still in the seed bank (ex: pau-branco that appears in clearings)* *Adapt legislation // regulations to ensure their protection* *Land acquisition* *Compensation to private individuals*
Increase public perception of endemic species, especially those on the island of Santa Maria, in order to protect species and ensure a better quality of life for people.	*- Involve the school community* *- Make an exhibition in script (for all island parishes) promoting nature conservation.* *- Publicize at Santa Maria parties and events*	***Engage the school community*** *Pre-school, 1st cycle, 2nd cycle, secondary and professional* *Make an exhibition in script (for all the parishes of the*

	- Involve the economic sector *- Involve the media with targeted marketing campaigns.*	*island) promoting the conservation of nature.* ***Prepare differentiated information*** *Integrate the tourist itinerary in the tourist information* ***Involve the economic sector*** *Hotels and stores use the information of endemic species in campaigns, products, image…*
Environmental management of forest areas	*Try to eradicate / minimize weeds and invaders.*	*Involve the owners in the removal, enhancing the gains of that action.* *Remove propagules over natural areas to prevent recurrence of propagation.*

Actividade 4: Action details table- Florestas

Objectivo/Acção	Quem será responsável / competência?	Quem / quais as organizações que ajudarão?	Quando será concluído? Janeiro 2021	Como saberemos que será implementado?	O que precisamos para garantir que conseguimos concluir a ação?
Objective: To protect the stock exchanges of endemic species that still exist outside the Santa Maria Natural Park, in order to recover the natural heritage					
Identify the most promising "endemic pockets" for nature conservation	Direcção Regional dos Recursos Naturais (DRRF)	- D.R.A - C.M.V.P.T. -	3 months 0 →3	Detailed report with list of areas and maps.	Human Resources Technical resources (e.g. drone)
Characterize endemic pockets	Universidade dos Açores	- D.R.A. - D.R.R.F. -C.M.V.P.T.	12 months 4 →15	Detailed report of promising areas. (inclusion and exclusion criteria)	Human Resources Vehicles for field support Laboratory consumables
(re) creating the basic conditions to allow colonization by native / endemic species and their maintenance	DRA	D.R.R.R.F. U.A.C. D.R.Agricultura C.M.V.P.T	36 months 7 →60 7 →8 nurseries: planting and cleaning 15-60 plant monitor and manage	Annual reports with photographs, quantification of planted and removed feet	Human and Technical Resources - technical knowledge of removing invasive species Plants in stock
Adapt legislation // regulations to ensure their protection	D.R.A	D.R.R.R.F. U.A.C. D.R.Agricultura	7→60	Acquisitions / Compensations	Financing Technical and human resources (lawyers)

		C.M.V.P.T			
Objectivo:					
Acção 1….					
Acção 2…					
Objectivo :					
Acção 1….					
Acção 2…					

Activity 3: **Map of Actions- Invasive plants** (to attain each objective)

Essa atividade será realizada no flipchart com o título da meta no centro de uma página e as ideias do grupo de trabalho sendo adicionadas (pelo facilitador) em volta da meta central. No entanto, você pode registrar o mapa mental em algo como a tabela a seguir:

Objectivo	**Principais idéias de acção** (o título amplo para grupos de idéias relacionados)	**Idéias de acção relacionadas**
A- Decrease the population of Hedychium and Pittosporum in forest in the central area of Pico Alto	1. Mapping of invasive populations and distribution; mapping orographic characteristics; (characterization of the reference situation) 2. Defining strategies for fighting each species (chemical, mechanical or biological) 3. Study of accesses to the places to intervene (terrain orography) 4. Study of intervention spatial and temporal dynamics. 5. Intervention / removal of invaders 6. Maintenance / remove new seedlings	-selective intervention (e.g. killing trees standing; leaving spots of invaders located; gradual cutting) - decomposition in situ - Regular monitoring of endemic invertebrates - Monitoring of physical and chemical changes in soil and opportunistic species in the ecosystem
B - Increase the regeneration of endemic plants in the central area of Pico Alto, to enhance the available area / habitat of invertebrates	1. Study of the most suitable endemics to plant 2. Plant nursery production 3. Plantation 4. Protection and Maintenance	- Regular monitoring of endemic invertebrates - Monitoring of physical and chemical changes in soil and opportunistic species in the ecosystem
C - Decrease the population of Hedychium, Pittosporum, Rubus and Acacia in the buffer zone of Pico Alto	1. Mapping of invasive populations and distribution; mapping orographic characteristics; (characterization of the reference situation) 2. Defining strategies for fighting each species (chemical, mechanical or	

	biological) 3. Study of accesses to the places to intervene (terrain orography) 4. Study of intervention spatial and temporal dynamics. 5. Intervention / removal of invaders 6. Maintenance / remove new seedlings 7. Cutting acacia trees and maintaining logs in situ to support / maintain wood decomposing species	
D - Increase patches of endemic flora in the buffer zone of Pico Alto	1. Study of the most suitable endemics to plant 2. Plant nursery production 3. Purchase of strategic land 4. Plantation 5. Protection and Maintenance 6. Study of the proper management of *Cryptomeria* forests	
E - Creation of ecological corridors in order to increase the habitats available to invertebrates	1. Inventory of the distribution of rare invertebrates on the island of Santa Maria 2. Definition of areas to be classified as priorities, considering the ecological values identified 3. Negotiation with owners on intervention methods 4. Mapping of invasive populations and distribution, orographic	Species to control: Pittosporum, Hedychium, Rubus, Cane, Lantana, Ipomea, Acacia

	characteristics; (characterization of the reference situation) 5. Definition of combat strategies for each species (chemical, mechanical or biological) 6. Study of accesses to the places to intervene (terrain orography) 7. Study of intervention dynamics. 8. Removal of invasive species 9. Maintenance / removal of new seedlings 10. Study of the most suitable endemics to plant 11. Plant nursery production 12. Plantation 13. Protection and Maintenance	

Actividade 4: Action details table- Invasive plants

Objectivo/Acção	Quem será responsável?	Quem / quais as organizações que ajudarão?	Quando será concluído?	Como saberemos que será implementado?	O que precisamos para garantir que conseguimos concluir a ação?
Objectivo: Reduzir X, na área Y, para atingir Z					
Action A.1….	UAç – Paulo Borges/ Azorina – Andrea Porteiro/ DRA – Hernâni Jorge	PNI / ONGA's / DRRF – Anabela Isidoro	2022/2023 (year 1)	Cartographic Map	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action A. 2…	DRA – Hernâni Jorge/ PNI – Rita Câmara	DRRF; ONGA's	2022/2023 (year 1)	Document delivery with combat strategy	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action A.3	DRA – Hernâni Jorge/ PNI – Rita Câmara	DRRF; ONGA's	2022/2023 (year 1)	Document delivery with combat strategy	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action A.4	PNI	DRRF / UAç	2023 (year 2)	Report delivery with mapping of interventions	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action A.5 e A.6	PNI / DRA	ONGA's /DRRF	(year 3 and followers)	Monitoring Report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities Allocation of time to DRA and PNI technicians
Action B.1	UAç – Paulo Borges/ Azorina – Andrea Porteiro/ DRA – Hernâni Jorge	PNI / ONGA's / DRRF – Anabela Isidoro	Year 1	Report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action B.2	PNI/DRA/DRRF		year 2 and followers	Monitoring Report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with

					partner entities
Action B.3 e B.4	PNI	DRRF/ ONGA's /	year 3 and followers	Monitoring Report	Financing by a conservation project (e.g. LIFE) Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Acção C.1	UAç – Paulo Borges/ Azorina – Andrea Porteiro/ DRA – Hernâni Jorge	PNI / ONGA's / DRRF – Anabela Isidoro	2022/2023 (year 1)	Cartographic Map	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Acção C. 2	DRA – Hernâni Jorge/ PNI – Rita Câmara	DRRF; ONGA's	2022/2023 (year 1)	Document delivery with combat strategy	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action C.3	DRA – Hernâni Jorge/ PNI – Rita Câmara	DRRF; ONGA's	2022/2023 (year 1)	Document delivery with combat strategy	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action C.4	PNI	DRRF / UAç	2023 (year 2)	Report delivery with mapping of interventions	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action C.5; C.6 e C.7	PNI / DRA	ONGA's /DRRF	(year 3 and followers)	Monitoring Report	Financing by a conservation project (e.g. LIFE) Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action D.1	UAç / DRA / PNI /DRRF		Year 1	Report	Allocation of time to DRA and PNI technicians Establishment of collaboration protocols with partner entities
Action D.2	PNI/ DRRF		year 2 and followers	Report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action D.3	DRA	PNI /JF	year 4 and	Land acquisition	Financing by a conservation project (e.g. LIFE)

			followers		Allocation of time to DRA and PNI technicians
Action D.4	PNI	DRRF/ONGA's	year 4 and followers	Progress report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action D.5	PNI	DRRF/ONGA's	year 4 and followers	Progress report	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action D.6	DRRF	DRA/ UAç	year 4 and followers	Monitoring Report	Financing by a conservation project (e.g. LIFE)
Action E.1	UAç	PNI	Already occurring	Report	Availability of Human Resources
Action E.2	UAç / PNI		Year 1	Report	Availability of Human Resources
Action E.3	DRA	PNI/JF	year 4 and followers	Land acquisition	Financing by a conservation project (e.g. LIFE)
Action E.4	UAç / DRA	PNI / ONGA's / DRRF	2022/2023 (year 1)	Cartographic Map	Financing by a conservation project (e.g. LIFE) Establishment of collaboration protocols with partner entities
Action E.5	PNI/DRA		Year 1	Report	Allocation of time to DRA and PNI technicians
Action E.6	PNI /UAç	DRRF	Year 1	Report	Allocation of time to DRA and PNI technicians
Action E.7	PNI/UAç		Year 1	Report	Allocation of time to DRA and PNI technicians
Action E.8 e E.9	PNI		year 2 and followers	Progress report	Financing by a conservation project (e.g. LIFE)
Action E.10	DRA/DRRF/PNI/UAç		year 1	Report	Allocation of time of DRA, PNI, DRRF and UAç technicians
Action E.11	PNI/DRRF		year 3 and followers	Progress report	Financing by a conservation project (e.g. LIFE)
Action E.12 e E.13	PNI		year 3 and followers	Progress report	Financing by a conservation project (e.g. LIFE)

Actividade 3: Mapa mental de possíveis acções- Tourismo (para atingir cada objetivo)
Essa atividade será realizada no flipchart com o título da meta no centro de uma página e as ideias do grupo de trabalho sendo adicionadas (pelo facilitador) em volta da meta central. No entanto, você pode registrar o mapa mental em algo como a tabela a seguir:

Objectivo	**Principais idéias de acção** (o título amplo para grupos de idéias relacionados)	**Idéias de acção relacionadas**
Exemplo: *Reduzir a área coberta pelas espécies invasoras X na área Y, a fim de aumentar a disponibilidade de habitat nativo*	*Acção de controlo com base na comunidade*	*Envolver as escolas secundárias locais* *Envolva os proprietários de terras na remoção de ervas daninhas* *Etc.*
- Identify sensitive areas to avoid their degradation and guarantee sustainability, reducing the negative impacts of tourism.		- Identify sensitive areas (identification criteria). - Provide information on sensitive areas. - Create and apply specific signs for sensitive areas. - Classify sensitive areas according to their importance. - Redesign routes (trails / accesses) according to the sensitive areas (for example drainage areas where you want to preserve).
- Regulate access to protected areas in order to minimize the negative impact of tourism activities.	- Create a regulation on access and use of protected areas.	- Define ways of applying the regulation (whether it will be informative, punitive? access fees, inspection). Depending on the areas, it may always be accessible or within a certain period of time (e.g., species reproduction period).
- Create rules for tourism support infrastructures.		- Valid for support infrastructures. - Assess the impact of infrastructure in each sensitive area (increased load in the area) and integration in the environment. - Assess the effect on tourist demand when planning infrastructure
- Minimize the impact of sports activities in sensitive areas.		- Create a conduct guide - Promote an inclusive debate with partners, as there

		is a void with regard to standards of conduct**.**
-	**We decided to aggregate the ideas into two main objectives**	
- **Minimize the impact of tourist activities (sports and leisure in sensitive areas).**	Identify sensitive areas and regulate their use.	
- **Minimize the impact of the creation and use of infrastructure to support tourism.**	Plan and assess the impact of infrastructure.	

Actividade 4: Action details table- Tourismo

Objectivo/Acção	Quem será responsável?	Quem / quais as organizações que ajudarão?	Quando será concluído?	Como saberemos que será implementado?	O que precisamos para garantir que conseguimos concluir a ação?
Objectivo: Reduzir X, na área Y, para atingir Z					
Minimize the impact of the creation and use of infrastructure to support tourism. 1-Assess the impact of current and future infrastructure	1- D.R.Ambiente (Rita Camara). * Autarchy, if it is an urban path.	Environmental Associations, Touristic Enterprises, Municipality, Presidents of Junta de Freguesia de Freguesia (Local Government).	1 – Continuos process.	1 – Impact study completed.	1 – Impact study completed and a regulation that allows the infrastructures to be built according to the interested parties (ex. To build a viewpoint it will be necessary to listen to tourist companies to know if it goes through the roadmap that the main companies use). There should be an evaluation period for public consultation before construction.
Minimize the impact of tourist activities (sports and leisure in sensitive areas). 1- Identify sensitive areas. 2- Classify sensitive areas 3- Provide Information /	1 – DRA (Rita) 2. DRA	1 – Academics and technicians 2-Assistants and technicians	1- Initial assessment and reassessment. 2- Within the impact study.	1 - Map / document of sensitive areas 2. Areas properly identified with maps and biological and geological description, taking into account the reason for being sensitive and needing extra protection.	1. Maps and documents of sensitive areas agreed by all.

Publication 4- Create and apply signage in sensitive areas. 5- redesign of walking trails 6-reinforcement of what already exists in the sensitive zone route 7- Create regulations (immediately after identifying sensitive areas).	3-DRA 4-DRA 5-DRA e servicos florestais 6-dra e servicos florestais 7-dra e servicos florestais	3-Official means, online, airport, sea station, own area. 4-Tourist entertainment companies, associations with nature sports 5-Local government, tourist entertainment companies, associations with nature tourism 6-technicians and engineers 7- local authorities, associations with nature sports, tourist entertainment companies	3- After the study All steps are in order	3- Information available on the premises (maps, documents easily accessible to local and foreign tourists). 4- signage in places 5- Redefined routes * Regulation will have to take into account the opinions of all interested parties.	