German Environment Agency

Umwelt Bundesamt

Workshop on Tourism Monitoring in Antarctica

Development of a concept for the analysis of the impacts of tourism on the assets to be protected in the Antarctic

INASEA

Fresh Thoughts Consulting
where science meets policy

Tourism Monitoring in Antarctica - Development of a concept for the analysis of the impacts of tourism on the assets to be protected in the Antarctic

BACKGROUND:

- Climate change expected to increasingly impact the sensitive Antarctic environment
- Rising tourist numbers and diversification of Antarctic tourism have the potential to have a (negative) impact on ecosystems or their individual components
- Overall, impacts of tourist activities in the Antarctic are poorly understood
- No targeted regulations for tourism exist

KEY FACTS ABOUT THE RESEARCH PROJECT:

- Duration: 2021-2024
- Contractors: Fresh Thoughts Consulting (Vienna, Austria), INASEA (Bremen, Germany)
- Initiated and comissioned by the German Environment Agency (UBA), funded by the German Federal Ministry for the Environment, Nature Conservation, Nuclear Safety and Consumer Protection (BMUV)

Aim:

- Overview of the current state of research on the impacts of tourism in Antarctica
- Development of a comprehensive, long-term concept for frequently visited tourist sites in the Antarctic
- Overall: advance the protection of the Antarctic environment

Tourism Monitoring in Antarctica - Development of a concept for the analysis of the impacts of tourism on the assets to be protected in the Antarctic

TIME LINE

WP 1:

Literature research on the impacts of tourism on the assets to be protected and existing monitoring approaches

WP 2:

Stakeholder participation in two international Workshops (May 2022, September 2023)

WP 3:

Development of a comprehensive monitoring concept

WP 4:

Presentation of results at the ATCM 2023 and 2024

WP 5:

Final project report

Programme

Time	Session
9.00-9.05	**Opening of the workshop and introduction** *Dr Heike Herata, German Environment Agency (UBA)*
9.05-9.20	**An overview of Antarctic tourism by IAATO** *Amanda Lynnes, IAATO*
9.20-9.35	**Tourism management in the context of multiple stressors in Antarctica** *Tom Hart, Department of Zoology - University of Oxford*
9.35-10.00	**Presentation of the findings from the literature review** (incl. gaps) *Thomas Dworak, Fresh Thoughts Consulting*
10.00-11.30	Split into 2-3 **working groups** to discuss the results from the literature review (incl. gaps) in parallel along with key questions set out in the discussion paper
11.30-12.00	**Report back and question and answers** General discussion of reported issues
12.00-13.30	*Networking lunch break*
13.30-13.45	**Presentation of first ideas for a comprehensive monitoring concept on the environmental impacts of Antarctic tourism** *Thomas Dworak, Fresh Thoughts Consulting*
13.45-15.45	Discussion of the concept and brainstorming in 2-3 parallel **working groups** along with key questions set out in the discussion paper
15.45-16.15	**Report back and question and answers** General discussion of reported issues
16.15-16.30	**Final remarks** incl. request for support for the work, next steps *Dr Heike Herata, German Environment Agency (UBA)*

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Findings from the literature review

Thomas Dworak, Fresh Thoughts Consulting

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Literature review on tourism in the Antarctic

APPROACH:

- Development of an analytical matrix for the analysis along the DPSIR framework (more details on this later)
- Compilation of a literature database comprising scientific articles, book chapters, conference or workshop papers, (project) reports, fact sheets
- Systematic analysis of 132 documents regarding the impacts of different tourist activities, monitoring methods, and proposed management measures

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Literature review on tourism in the Antarctic

RESULTS:

GENERAL FEATURES OF ANTARCTIC TOURISM

- Rapid increase in visitor numbers in recent decades, upward trend is expected to continue
- Diversification of tourism (activities including kayaking, scuba diving, mountain climbing snorkelling, skiing, snowboarding, camping, …)
- Tourism is mainly concentrated to the Antarctic Peninsula, and to the Ross Sea (but with considerably lower visitor numbers); increasingly also visitations to East Antarctica
- growing body of literature focusing on polar tourism

Main findings from the literature review

PRESSURES TO THE ANTARCTIC ENVIRONMENT:

- Different tourist activities can be related to diverse pressures:
  - Introduction of pathogens
  - Introduction and dissemination of invasive species
  - Pollution of air, water or soil (e.g. sewage water, oil spills, littering)
  - Disturbance of marine or terrestrial wildlife
  - Reinforcement of global climate change

POTENTIAL IMPACTS OF TOURISM

- Tourism can potentially be attributed to a diverse range of impacts:
  - Soil degradation and damage to vegetation due to trampling
  - Damage to marine habitats
  - Loss of indigenous biodiversity
  - Changes in the composition of species communities
  - Physiological and behavioural changes which can lead to changes in species distribution and abundance

→ clear evidence for negative impacts caused by tourism

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Main findings from the literature review

REDUCING OR AVOIDING NEGATIVE IMPACTS OF TOURISM

- Focus on mitigating the local impacts of tourist activities, e.g. through:
  - Minimum distance to wildlife
  - Cleaning of clothing and gear to prevent the spread of alien species
  - Standards for cruise ships
  - Restricting landings for large vessels
  - Coordination of landings to avoid concentration of visitors on land

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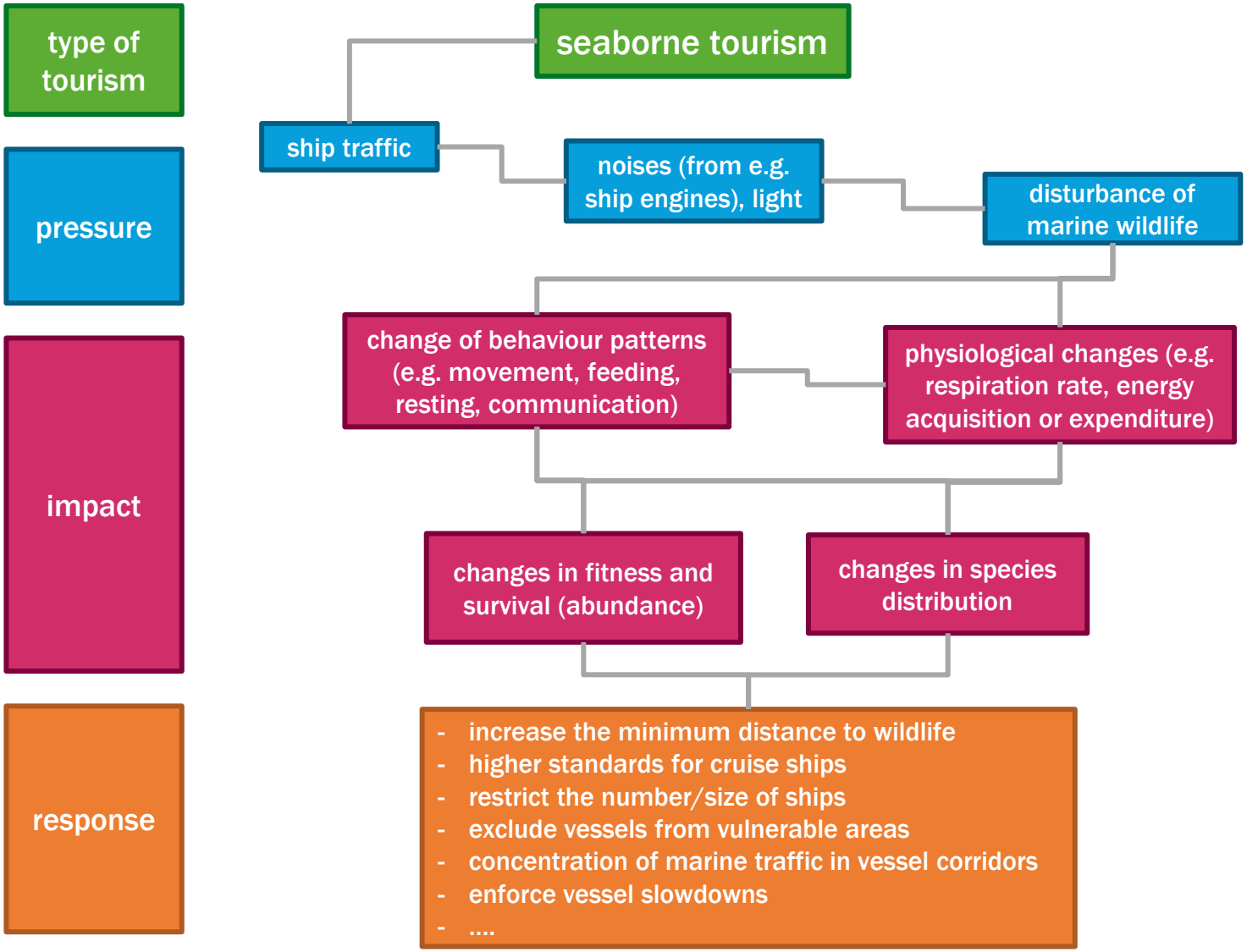
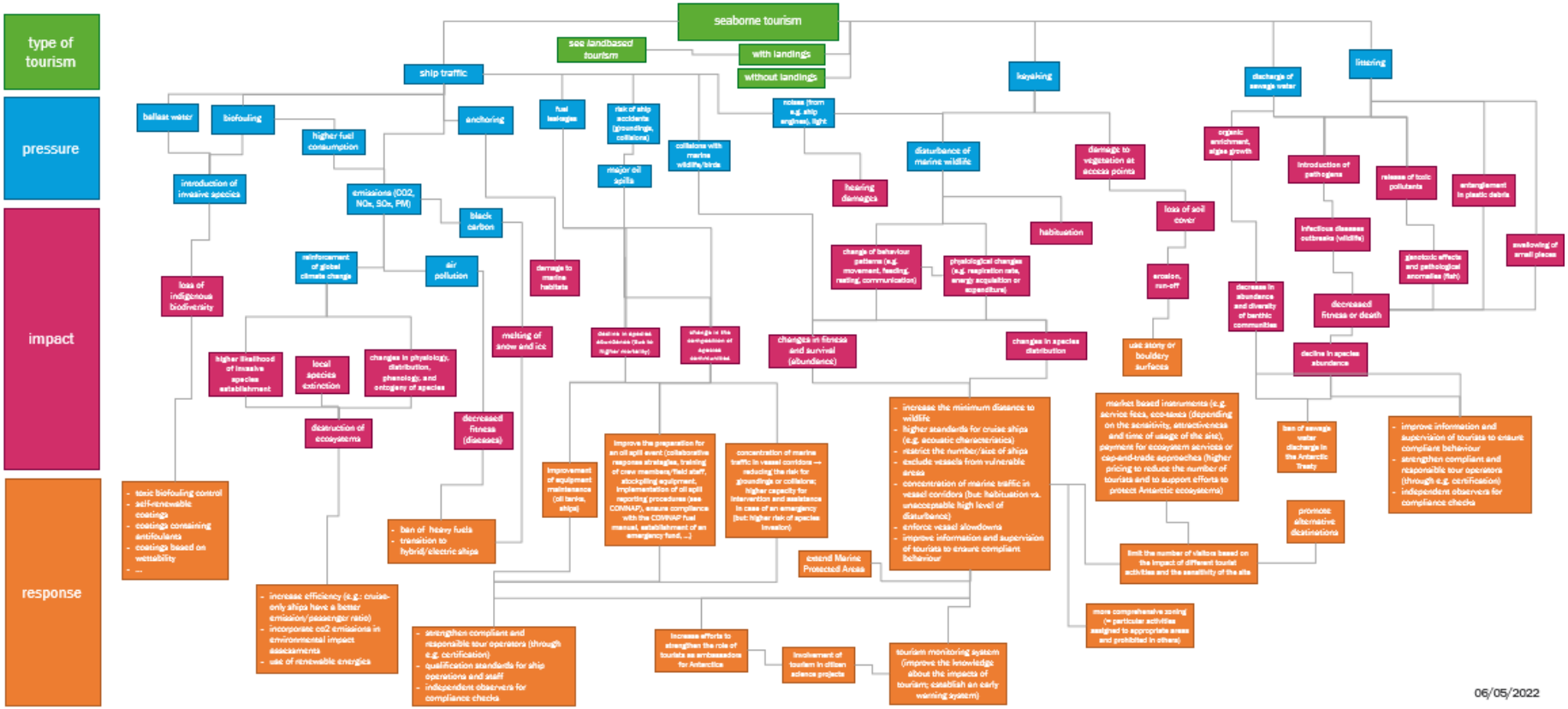
Example: Disturbance of marine wildlife through ship traffic



Environmental impacts of tourism: Pressure-impact-response diagrams



- Correlate different types of tourism, corresponding tourism activities and related environmental pressures with potential impacts on the environment and proposed management measures
- 3 cause-effect relation diagrams for the main types of tourism (seaborne, land-based, airborne)
- Relationships are complex and multilayered

Main findings from the literature review

BUT:

- Current efforts are criticised for relying mainly on management and self-regulation, lack of legal regulations specifically for tourism
- Lack of considering large-scale impacts of tourism (e.g. Antarctic tourism contributing to global climate change)
- Potential ambassador role of tourists is discussed controversially
- Management strategies: spatial concentration of tourists (as currently pursued) preferable or a more widespread distribution?
- Efforts are inconsistent and uncoordinated according to most authors
  → current level of environmental protection is inadequate

DISCUSSION SOLOUTIONS:

- Revision of site guidelines according to scientific recommendations
- Improve supervision of tourists and tour operators
- Limit the number of visitors and restrict certain tourist activities (based on the sensitivity of the site and the impacts of different tourist activities)

Knowledge gaps

- Impacts are to date rarely quantified
- cumulative impacts and the relationship between short-term and long-term impacts are poorly understood
- Literature focuses on highly visited areas (Antarctic Peninsula) and cruise tourism mainly, gaps in the knowledge about impacts of less frequently performed tourist activities
- Lack of a comprehensive understanding of the different components of the environment and their interactions on a larger scale
- Knowledge about the effectiveness of different management measures is limited

Questions for the working groups (part 1, 10:00 - 11:30)

Question 1: Were all relevant drivers, pressures and environmental impacts identified?

Question 2: Which further knowledge gaps need to be considered in developing the monitoring system?

Question 3: How can knowledge gaps be made explicit and how can they be addressed effectively in the monitoring system?

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First draft for a concept for monitoring the environmental impacts of tourism

Thomas Dworak, Fresh Thoughts Consulting

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Monitoring of tourism impacts

AIM:

- Expand the knowledge base about the impacts of tourist activities in the Antarctic
- Inform future management decisions, advance the protection of the Antarctic environment (formal and informal)
- Early warning system: detect any impacts that are more than *minor or transitory* before they occur (see Protocol on Environmental Protection to the Antarctic Treaty)

Monitoring of tourism impacts

CONCEPTUAL CHALLENGES:

- Complex interactions between local impacts of different tourist activities (and other human activities in the Antarctic), global environmental change and the environment
- No simple cause-impact relations
- Changes are not necessarily linear but can occur rapidly
- Cumulative impacts
- Interpreting impacts on wildlife is challenging (e.g. due to habituation effects, and behavioural changes do not necessarily reflect physiological changes)
- Impacts determined by behaviour of tourists/tour operators
- Different local contexts
- Long term and large-scale impacts of tourist activities
- Insufficient knowledge about the Antarctic ecosystem and impacts of human activities

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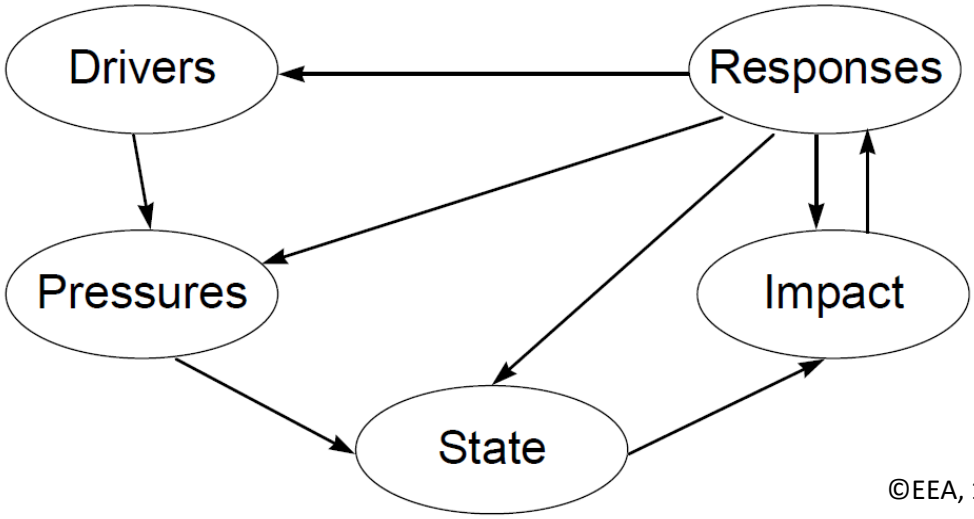
Monitoring of tourism impacts

OPERATIONAL CHALLENGES:

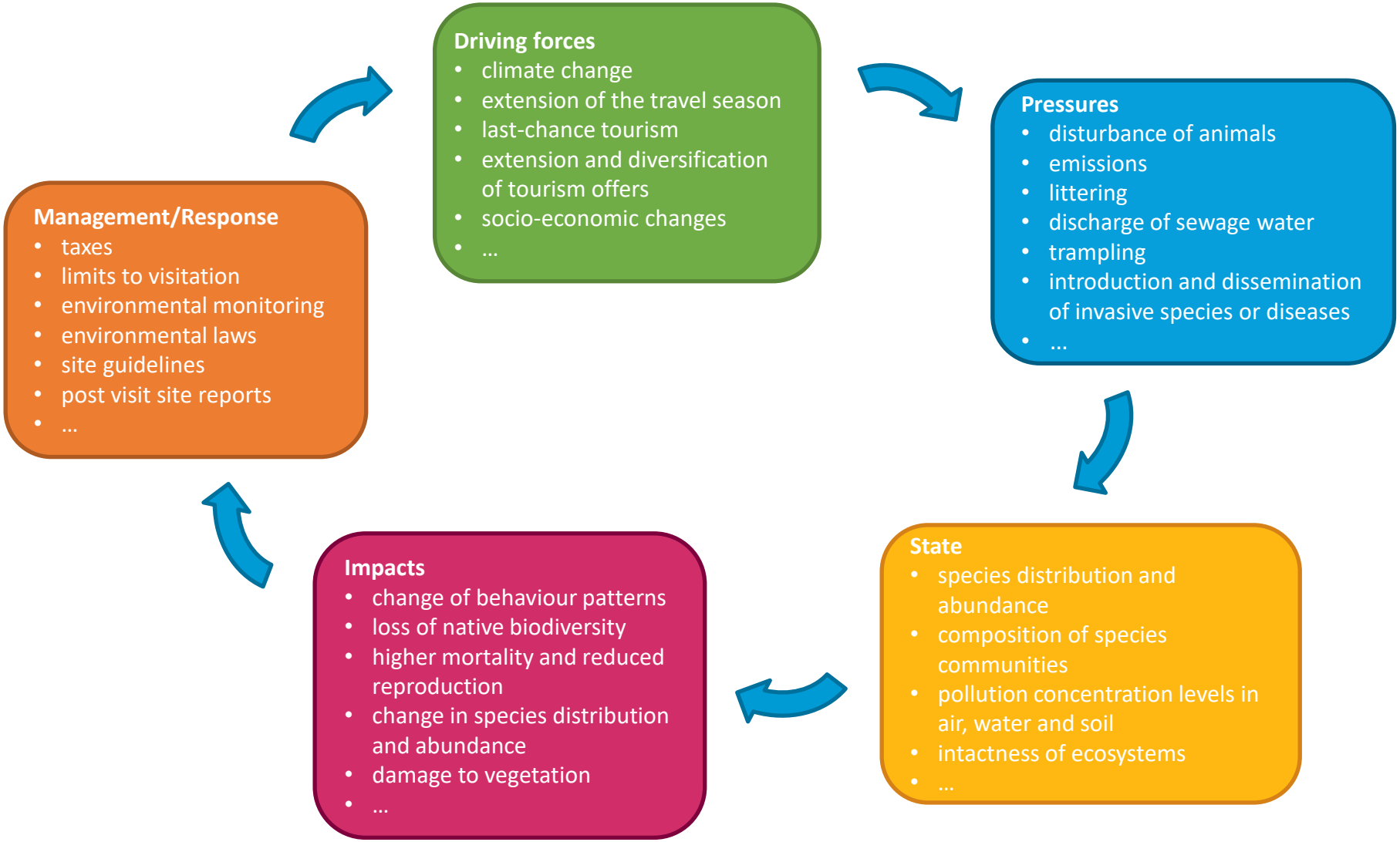
- Securing adequate financial resources
- Involvement and cooperation between different stakeholders
- Incorporation of existing monitoring approaches
- methods/platforms for sharing data and harmonized/comparable data formats

The DPSIR framework

- Introduced by the EEA in 1999
- Aims to reflect the complex interrelations between the natural environment and human systems → systemic view on ecosystems
- Monitor the effectiveness of management responses
- DPSIR = **D**riving forces, **P**ressure, **S**tate, **I**mpact, **R**esponse



Monitoring concept based on the DPSIR framework



Shortcomings of the DPSIR framework

- Oversimplification of the reality
- Distinction between environmental and human system is artificially constructed
- Descriptive rather than analytical: complex causal relationships between the DPSIR elements are difficult to capture in the framework

Questions for the working groups (part 2, 13:45 - 15:45)

Question 1: What should be the aim of the monitoring, what should it be able to monitor?

Question 2: Is the DPSIR framework suitable as a basis for developing the monitoring concept? How can the shortcomings of the concept be overcome in practice? Which alternative concepts should be considered?

Question 3: How can conceptual challenges related to the monitoring be addressed and considered in the monitoring (e.g. cumulative effects, different local contexts, complex cause-impact relations)?

Question 4: Which organisations/institutions should be involved in the monitoring and how?

Question 5: Which role could citizen science play in the monitoring?

Question 6: How can the funding of the monitoring system be secured?