

**Appendix 4.** The outcomes of frame analysis regarding framing scale challenges as derived from limited fit. The numbers within parentheses indicate how many participants can be attributed to each code. GR refers to the participants of the focus group discussions in Greece and FIN refers to those in Finland.

Scale-related problems  
(Diagnosis and roles of actors)

Codes

*Mismatches between conservation objectives and human action (in terms of time, space, knowledge)*

Policies are implemented according to administrative boundaries and the latter do not coincide with the boundaries of natural resources (GR: 13; FIN: 11)

Geographical areas of management institutions responsible for the protection and the protected area itself or the conservation objective do not match (GR: 12; FIN: 10)

Time scale of conservation practices (e.g., short-term implementation periods, changes in compositions of responsible agencies and in content of policies) follow human timelines, e.g., electoral cycles (GR: 10; FIN: 8)

The short-term implementation time of policies hinders commitment to long-term management efforts, e.g., certificates of organic farming, short-term project funding, annual management plans (GR: 6; FIN: 5)

Models and scientific predictions about biodiversity loss are not translated into information that can predict local impacts and guide local conservation actions (GR: 6; FIN: 5)

*Problems in choosing boundaries and implementing zoning plans within conservation areas*

Administrative and legal boundaries, e.g., division of policy sectors, property rights, ownership titles, dominate over ecological processes when defining boundaries (GR: 11; FIN: 10)

The boundaries of protected areas do not simultaneously capture natural boundaries, administrative borders, and human activities (GR: 11; FIN: 10)

The diversity of laws and policy sectors governing human activities do not always match the various drivers of biodiversity loss (GR: 9; FIN: 11)

Borders of protected areas and zoning plans do not match with often larger (or smaller) spatial boundaries of natural systems composing of hierarchical and complex ecological structures (GR: 5; FIN: 5)

*Underestimation of the way that scale challenges are related to justice and power*

Most policies are implemented following a top-down and not a bottom-up approach (GR: 13; FIN: 10)

Stakeholders that are involved in decision making processes or participatory procedures often do not represent the groups and activities that are located within conservation areas (GR: 11; FIN: 9)

The relationship between the EU level and the national level is a relationship of supervision and control, as it is between a ministry and a lower administrative level (GR: 11; FIN: 3)

The implementation of policy takes place at lower administrative levels, e.g., by local agencies or regional authorities, but the funding is allocated at national level without the participation of lower levels (GR: 5; FIN: 2)

*Ineffective coordination of conservation policies across different governance and/or administrative levels*

Mismatch between international or European obligations and national legislation as well as between national legislation and regional administrative guidelines, organization cultures and practices (GR: 11; FIN: 8)

Decisions are being made at top levels, e.g., EU, and they cannot be implemented at lower levels because of lack of resources, capabilities, or legitimacy deficit (GR: 9; FIN: 3)

Innovations made at lower levels are ignored at higher levels, e.g., EU and national, and thus they do not receive resources, capabilities, or official support (GR: 2; FIN: 4)

Governance scale does not exist in the sense that intermediate levels and/or communication efforts between existing levels are too weak (GR: 4; FIN: 1)

*Problems in integrating the biodiversity dimension into other policies across different governance and/or administrative levels*

There is not enough communication between the authorities responsible for the conservation of protected areas and those that are responsible for surrounding areas (GR: 13; FIN: 9)

Subsidies for green development and environmentally friendly activities do not match spatially and temporally with conservation objectives (GR: 12; FIN: 9)

Absence of concrete and powerful coordinating mechanisms, e.g., planning instruments or economic incentives, across sectors and state administrations (GR: 12; FIN: 3)

Division of responsibilities does not follow the spatial patterning of conservation problems rendering impossible the

effective cross-sectoral coordination (GR: 5; FIN: 3)

Fragmentation of governance scale, e.g., fragmentation of responsibilities or authorities, can be responsible for fragmentation of habitats and ecosystems (GR: 3; FIN: 3)

Solutions to identified problems  
(Prognosis and roles of actors)

*Resolving mismatches between conservation objectives and human action (in terms of time, space, knowledge)*

Match policy instruments at different governance levels to the scale-dependence of drivers causing biodiversity loss (GR: 12; FIN: 11)

Participatory institutions and decision making structures should refer to the same spatial area (GR: 11; FIN: 8)

Alignment of governance structures and policy instruments to ecological borders (GR: 10; FIN: 9)

Scientific research should inform administration to find the optimal governance level for handling the conservation problem in hand (GR: 5; FIN: 4)

Transboundary cooperation for migratory species, pollution issues, and global climate change mitigation (GR: 5; FIN: 2)

*How to choose boundaries and implement zoning plans within conservation areas*

Governing institutions should match the borders of conservation areas (GR: 11; FIN: 8)

Governing institutions should match the borders of ownership (GR: 7; FIN: 10)

Boundaries of protected areas and conservation zones should match natural boundaries (GR: 9; FIN: 8)

Better matching of the borders of management institutions and natural resources on the basis of the results of cross-administrative communication (GR: 6; FIN: 7)

Better matching of the borders of management institutions and natural resources on the basis of the results of systematic scientific monitoring (GR: 5; FIN: 3)

*Acknowledgment of the way that scale*

Economic incentives should be used to compensate the actual and potential costs of conservation to local people from national

*challenges are related to justice and power*

budget (GR: 11; FIN: 12)

Citizens should be educated about the fact that global or national benefits of biodiversity are more important than short-term local interests (GR: 11; FIN: 7)

States should carry responsibility for conservation, but also share power through increased communication between administrative levels and the private sector (GR: 6; FIN: 5)

The extent of human activities that is restricted because of conservation measures should be defined in a spatially explicit way (GR: 5; FIN: 6)

*Effective coordination of conservation policies across different governance and/or administrative levels*

Identification of the ideal administrative level for each decision and action (GR: 11; FIN: 10)

State support for multilevel institutions with representatives from each governance sector and level (GR: 11; FIN: 9)

More meaningful cooperation between EU and national levels (GR: 11; FIN: 5)

Clear defined responsibilities and authorities for each administrative level and support for them from other sectors and levels through increased communication (GR: 7; FIN: 5)

Jurisdictional levels should be selected according to the scale of the legislation, e.g., national level should be responsible for EU responsibilities (GR: 6; FIN: 2)

*Integration of the biodiversity dimension into other policies across different sectors, governance, and/or administrative levels*

Broadening the “classic” conservation approach (establishment of protected areas) to areas surrounding the strictly protected areas and the areas between them (GR: 7; FIN: 10)

Environmental education to change people’s attitudes and behavior and increase personal commitment (GR: 12; FIN: 5)

It is a national responsibility to protect an area of international biodiversity significance and administrative arrangements should ensure that this responsibility cannot be overridden by short-term local interests (GR: 8; FIN: 1)

Economic instruments should be used in a more “scale-sensitive” way, e.g., implemented at the level which is most relevant for each conservation goal (GR: 5; FIN: 4)

Incentives and sanctions for the integration of biodiversity

conservation with other policy sectors must be under the authority of national level because they refer to international obligations (GR: 4; FIN: 2)