

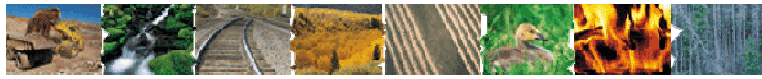
Minimisation of and Adaptation to Climate change Impacts on biodiversity



Mitigation, adaptation and the threats and opportunities for biodiversity

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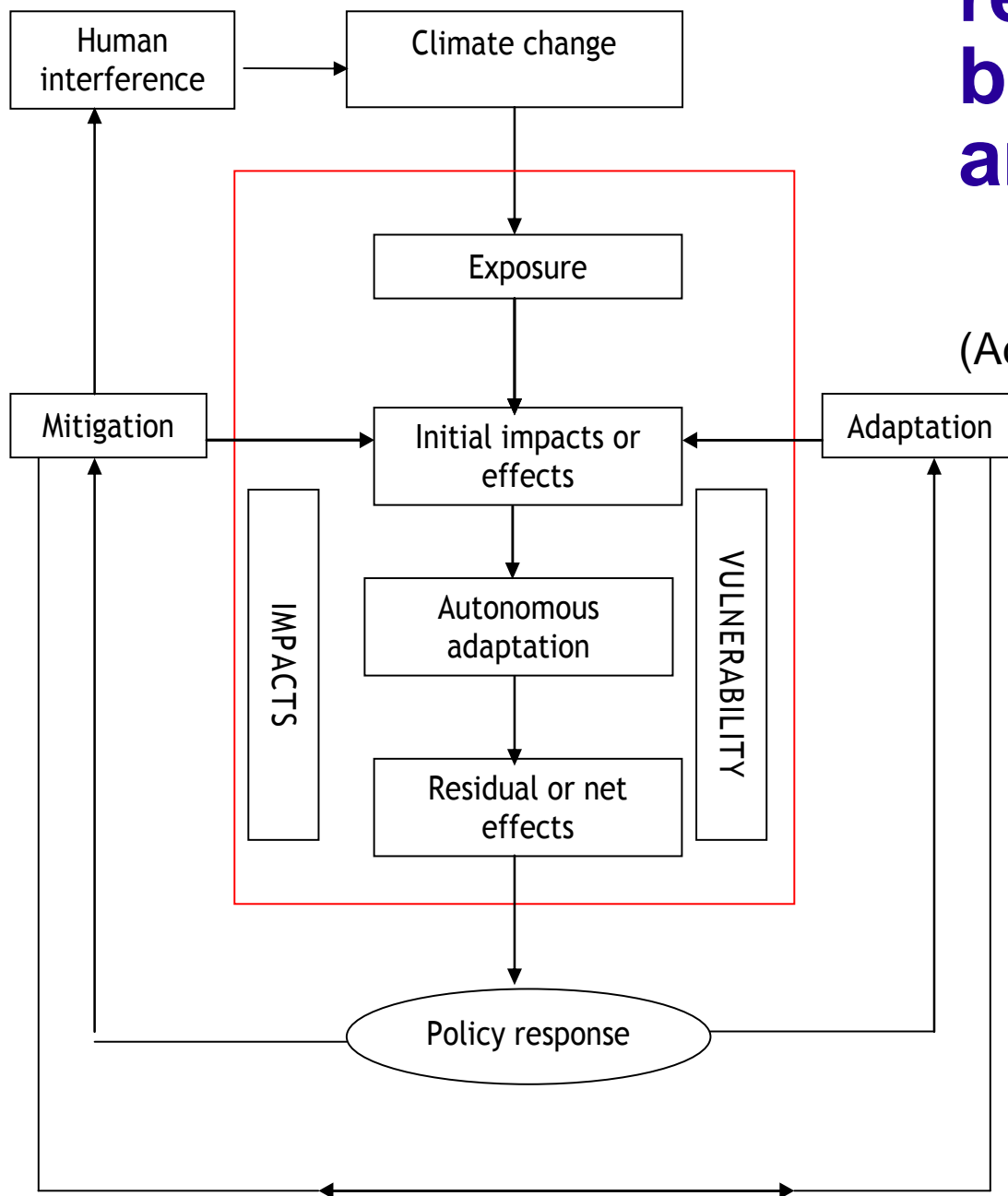


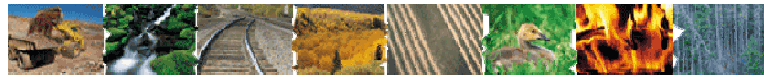
Outline

1. Inter-relationship between mitigation and adaptation;
2. Impact of mitigation and adaptation measures on biodiversity;
3. Inter-sectoral relationship of mitigation and adaptation measures and biodiversity;
4. Identify potential threats and opportunities of mitigation and adaptation for biodiversity

The inter-relationship between adaptation and mitigation.

(Adapted from *Smit et al., 1999*)



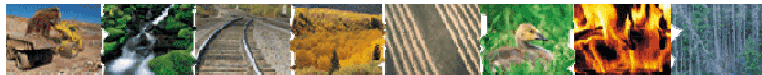


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Review of the impacts of mitigation and adaptation measures on biodiversity.

- Agriculture
- Forestry
- Energy
- Built environment
- River and coastal flooding
- Tourism and leisure
- Health
- Conservation



Summary of impacts

Crop Production Mitigation or Adaptation Strategy	Biodiversity Impact		Habitats affected									Taxa affected					
	Impact under worst practice	Impact under best practice	Marine	Coastal	Inland surface waters	Mires, bogs and fens	Grasslands and tall forb habitats	Heath land, scrub and tundra	Woodland and other wooded areas	Unvegetated or sparsely vegetated habitats	Agricultural, horticultural and domestic habitats	Mammals	Birds	Amphibians/Reptiles	Fish	Invertebrates	Plants
Cover crops	↘	↗				Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ
Water management	↘	↔			Ñ						Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ
Soil compaction	↔	↗			Ñ		Ñ				Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ
No-till	↘	↗									Ñ	Ñ	Ñ			Ñ	Ñ
Precision farming	↔	↗			Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ	Ñ

- ↑ Highly beneficial for biodiversity, ↗ Moderately beneficial for biodiversity,
- ↔ No known effect on biodiversity, □ Moderately detrimental for biodiversity,
- ↓ Highly detrimental for biodiversity,

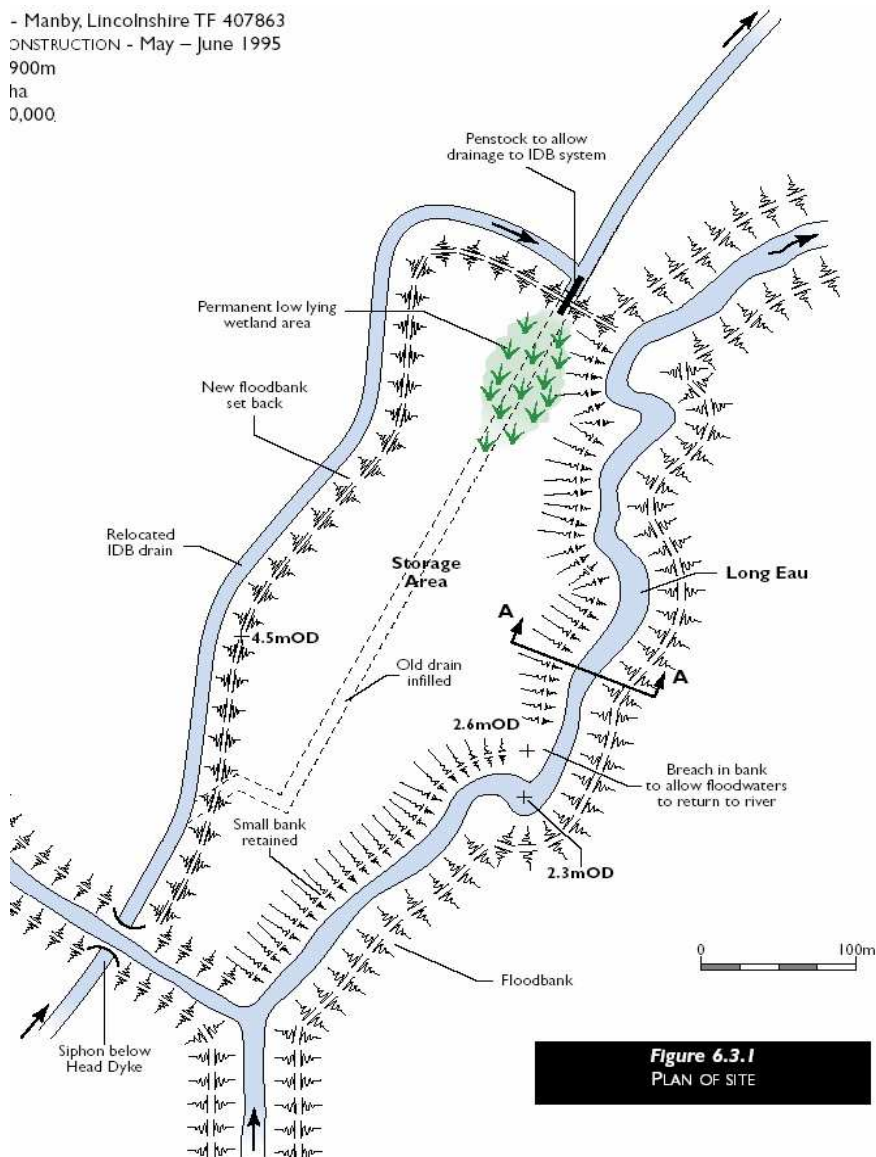
Impacts of coastal hard defence structures

	Factor	Spatial scale	Temporal scale	Direction of change	Predictability
Soft-bottom species richness		Local	Short to medium	↑ ↓	**
		Regional	Long	↑ ↓	*
Hard-bottom species richness		Local	Short to medium	↑	***
		Regional	Long	↑ ↓	*
Fish and mobile fauna		Local	Short to medium	↑	***
		Regional	Long	↑ ↓	*
Ephemeral and nuisance species		Local	Short to medium	↑	***
Non-native species		Regional	Medium to long	↑	**
Dispersal barriers		Regional	Medium to long	↓	*
Habitat fragmentation		Regional	Medium to long	↑	*

Both direction of change (↑=increase, ↓=decrease) and estimates of the current ability to make predictions (*=low, **=moderate, ***=good). Modified from Airoidi et al., 2005.

Long Eau Washlands, (Lincolnshire): Washland re-creation

- Manby, Lincolnshire TF 407863
CONSTRUCTION - May - June 1995
900m
ha
0,000.



From Morris, 2004

Beach nourishment

Dredging site

.benthic organisms

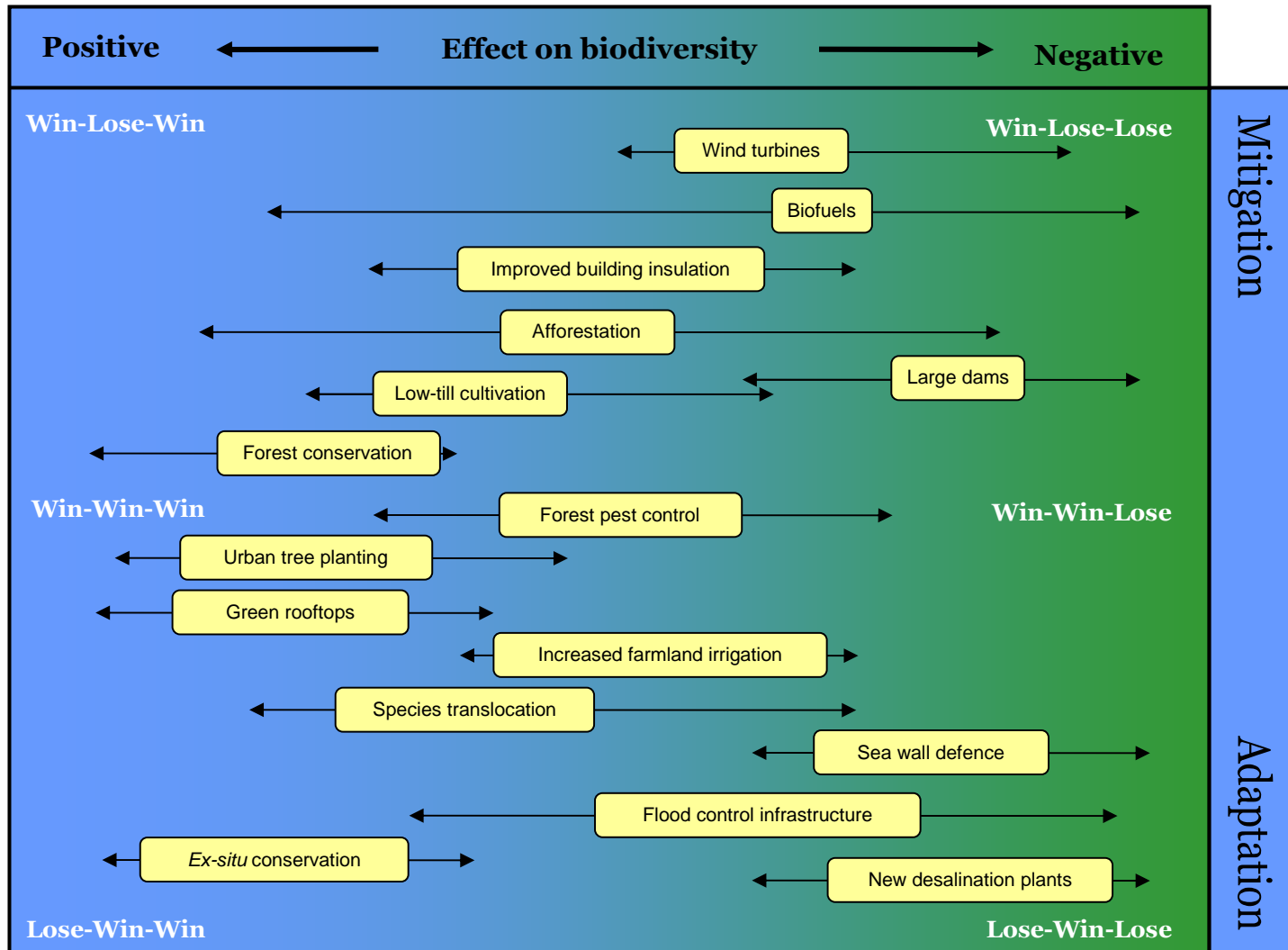
Beach

- species diversity
- invertebrates
- crabs
- fish
- +/- turtles
- + some shore nesting birds

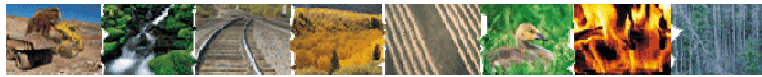


SCEhardt

Known and potential relationships between mitigation and adaptation measures and their impacts on biodiversity

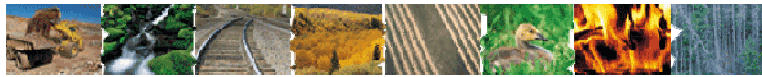


Paterson et al. Cons. Biol early online



Risk assessment

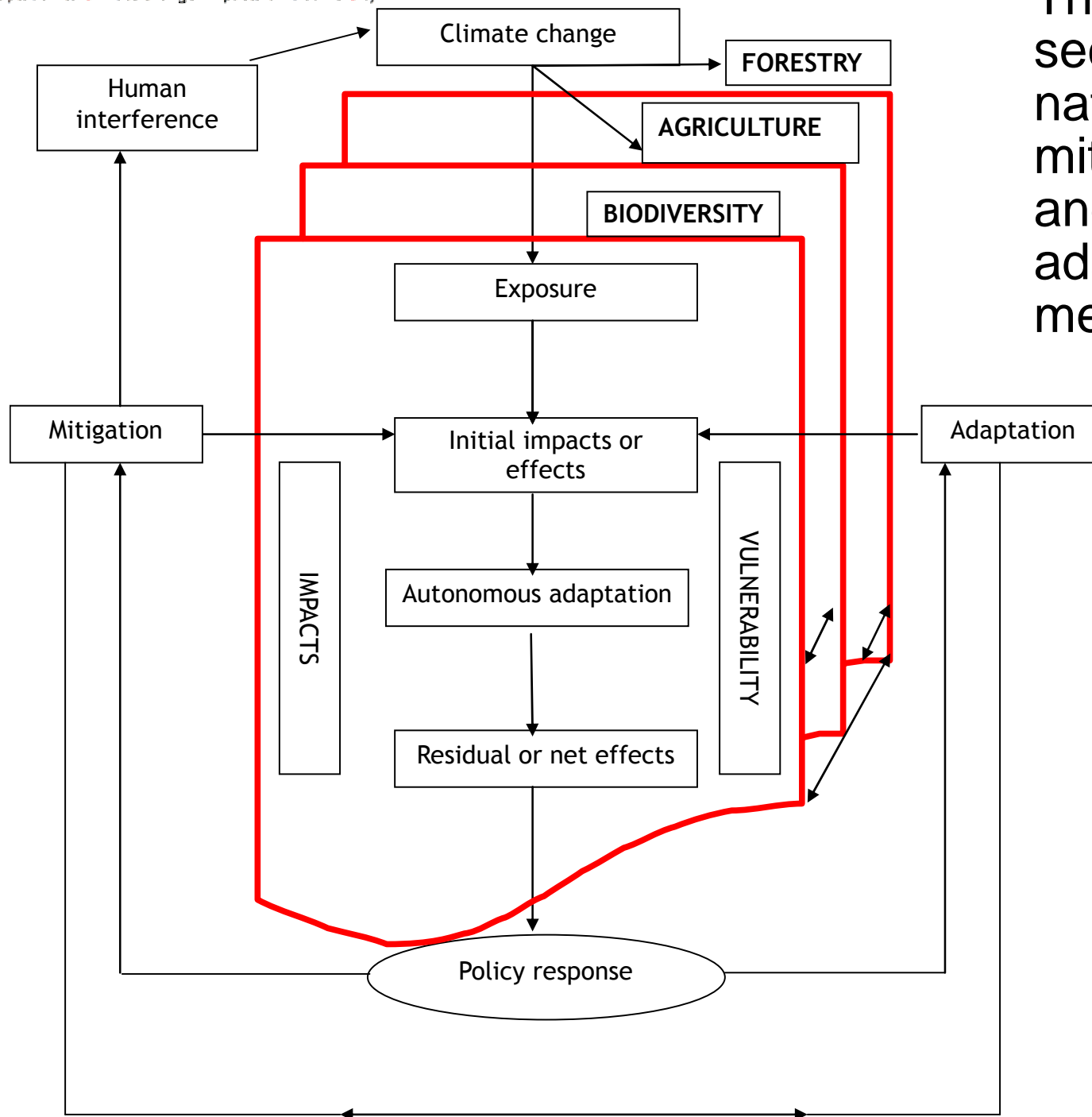
Risk Estimate Matrix –					
Likelihood of strategy implementation	Highly likely	Low	Moderate	High	High
	Likely	Negligible	Low	High	High
	Unlikely	Negligible	Low	Moderate	High
	Highly unlikely	Negligible	Negligible	Low	Moderate
		Marginal	Minor	Intermediate	Major
		Consequences for Biodiversity			



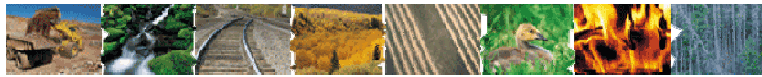
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Risk assessment for selected coastal flooding measures

Risk Estimate Matrix					
Likelihood of strategy implementation	Highly likely		Accommodation		
	Likely	←	Beach manipulation	→	Beach nourishment
	Unlikely				
	Highly unlikely				
		Marginal	Minor	Intermediate	Major
		Consequences for Biodiversity			



The cross-sectoral nature of mitigation and adaptation measures



Cross-sectoral interactions

Agriculture

Forestry

Energy

Built environment

Flood management

Agriculture

Forestry

Energy

Built environment

Changing tillage practice can reduce runoff (7.1.1.1). Dikes and embankments - protect farmland from erosion (7.1.18.3).

Coastal realignment- loss of farmland (7.2.2)

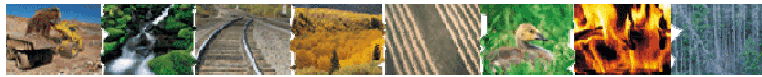
Afforestation may reduce flooding (7.1.1.4)

Tidal barrages and wave energy converters - green energy and may offer some coastal protection (7.2.1.1)

Dikes and embankments - protect settlements from erosion (7.1.18.3). Flood management can be part of urban and building design (7.1.4)

Conclusions

- mitigation and adaptation measures can contribute positively, neutrally or negatively to biodiversity;
- this can depend on the location, temporal and spatial scale of the measure and the manner of its implementation;
- many measures are cross-sectoral in implementation and impact, so we need an integrated approach;
- there are uncertainties and gaps in our knowledge, **but** we need to promote win-win situations and avoid/minimise those which pose high risks.



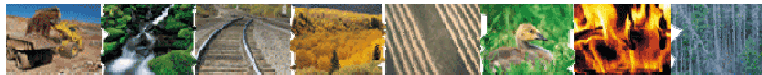
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Thank you!

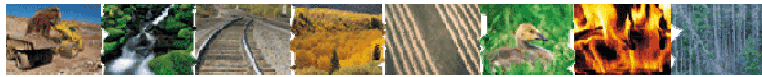
Comments welcome





Minimisation of and **A**daptation to **C**limate change **I**mpacts on **b**iodiver**S**ity





Minimisation of and **A**daptation to **C**limate change **I**mpacts on **b**iodiver**S**ity

