

ANNEX 3

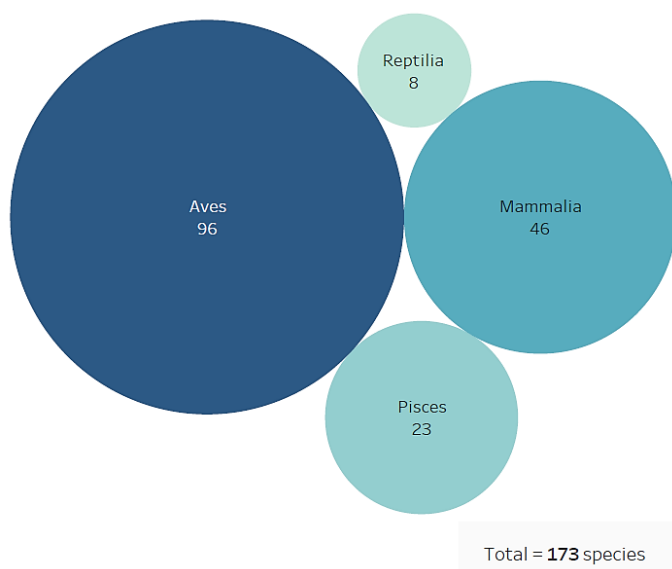
**PRELIMINARY ANALYSIS OF IUCN RED DATA LIST INFORMATION ON SPECIES
LISTED ON, AND COVERED BY CMS APPENDICES**

Contents

APPENDIX I	2
Conservation status	2
Main threats affecting species listed on Appendix I	4
APPENDIX II	14
Appendix II-listed species by taxonomic group	14
Conservation status	14
Population Trends.....	15
Main threats affecting species listed on Appendix II	16
Species listed and covered on Appendix II	26
Conservation status	26
Population Trends.....	27
Main threats affecting species listed and covered on Appendix II.....	28

APPENDIX I

Appendix I-listed species by taxonomic group



CMS Appendix I includes 173 taxa at the species or sub-species levels, of which 46 mammals, 96 birds, 8 reptiles and 23 fishes. (Fig. 1)

Fig. 1 Species and subspecies listed on Appendix I by broad taxonomic category

Conservation status

IUCN Red List categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated in Appendix I for some species. Of the species listed in Appendix I (Fig. 2), one (<1%) is assessed as 'Extinct in the wild'; 38 (22%) are assessed as 'Critically Endangered'; 47 (27%) as 'Endangered'; 51 (29%) as 'Vulnerable'; 13 (8%) as 'Near Threatened'. Hence a total of 150 species, i.e. ca. 87% of all migratory species in Appendix I, can be considered as being of significant global concern. Of the remaining 22 species, 15 (9%) are assessed as 'Least Concern' and 2 (1%) as 'Data Deficient'. For 5 species (3%) no assessment is available in the Red List database and are classified in this analysis as 'Species not assessed'.

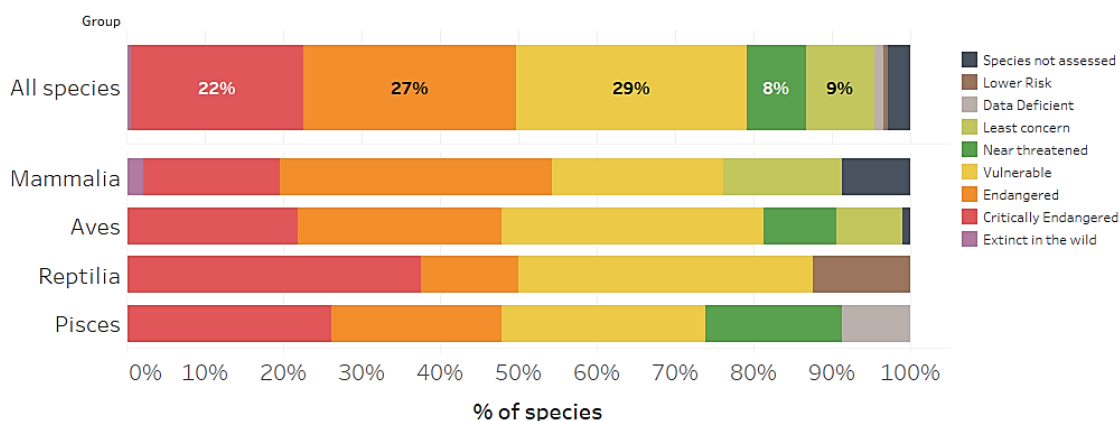


Fig. 2 Percentage of Appendix I-listed species in IUCN Red List Categories

According to the CMS Guidelines for assessment of Appendix I and II listing proposals, a taxon assessed as 'Extinct in the Wild', 'Critically Endangered', or 'Endangered' using the IUCN Red List criteria is eligible for consideration for listing in Appendix I, recognizing that CMS Appendix I species are broadly defined as 'endangered' (Fig. 3). Of the species currently listed on Appendix I, 86 (50%) meet the current criteria for listing on the Appendix.



Fig. 3 Percentage of Appendix I-listed species meeting the criteria for listing defined in Res.11.33 (Rev.COP12) as regards conservation status

Population Trends

Population trends categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated in Appendix I for some species. The current population trend for 127 species (73%) listed on Appendix I is 'Decreasing' (Fig. 4); for 14 species (8%) is 'Increasing'; for 9 species (5%) is 'Stable'; for 15 species (9%) is 'Unknown', for 2 species (1%) is 'Unspecified'. For 5 species (3%) no information on population trends were found in the Red List database and are classified in this analysis as 'Species not assessed'.

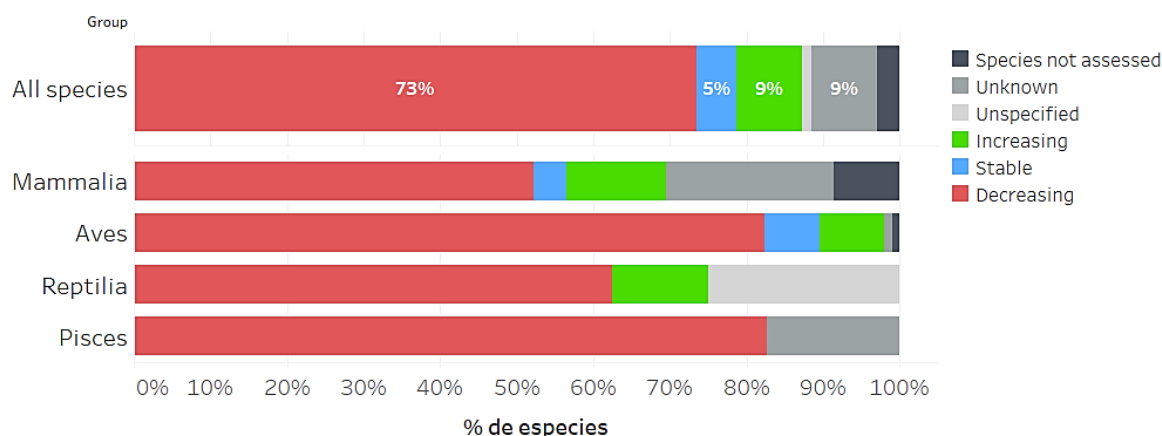


Fig. 4 Population trends for species listed on Appendix I

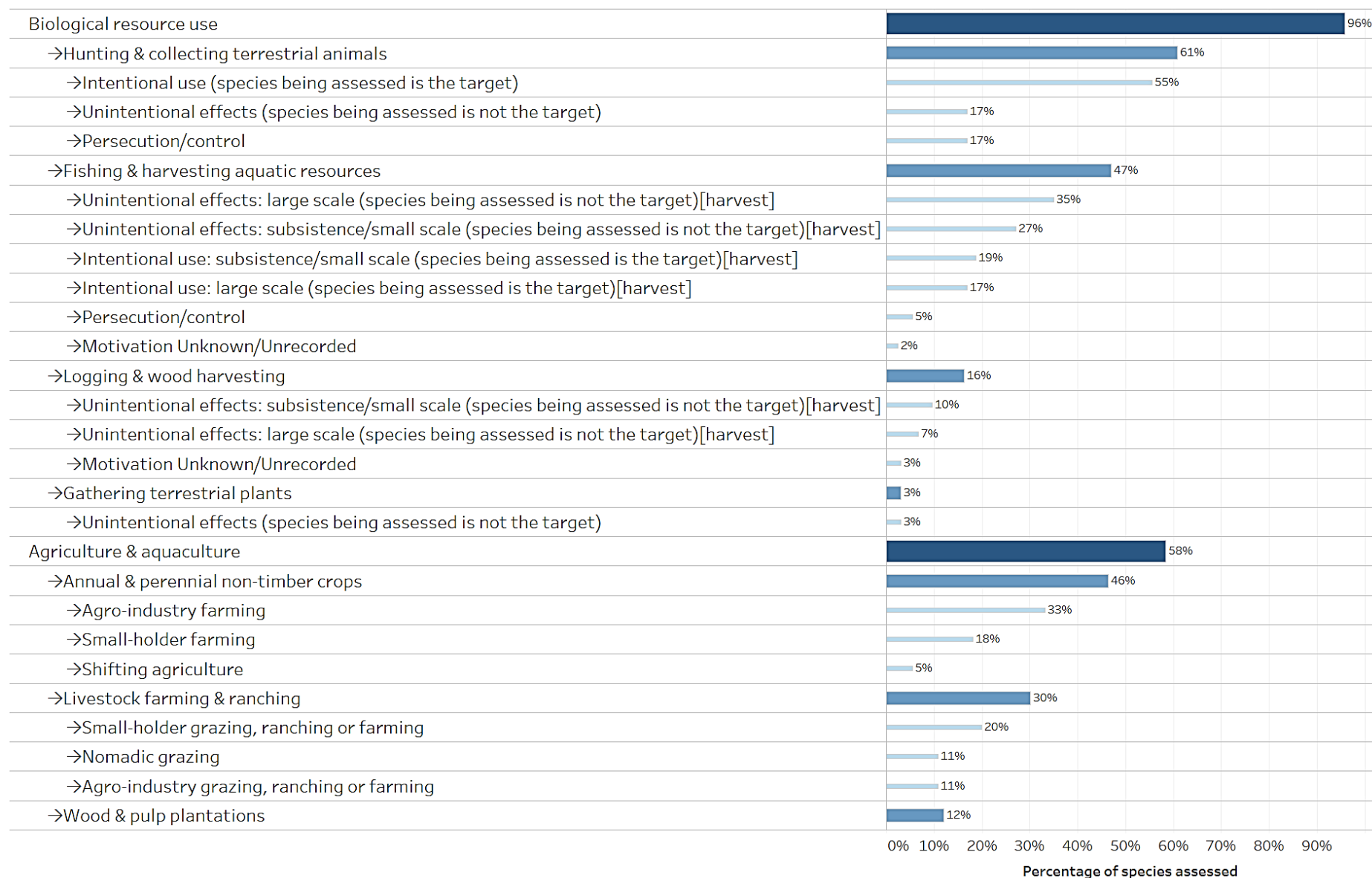
Main threats affecting species listed on Appendix I

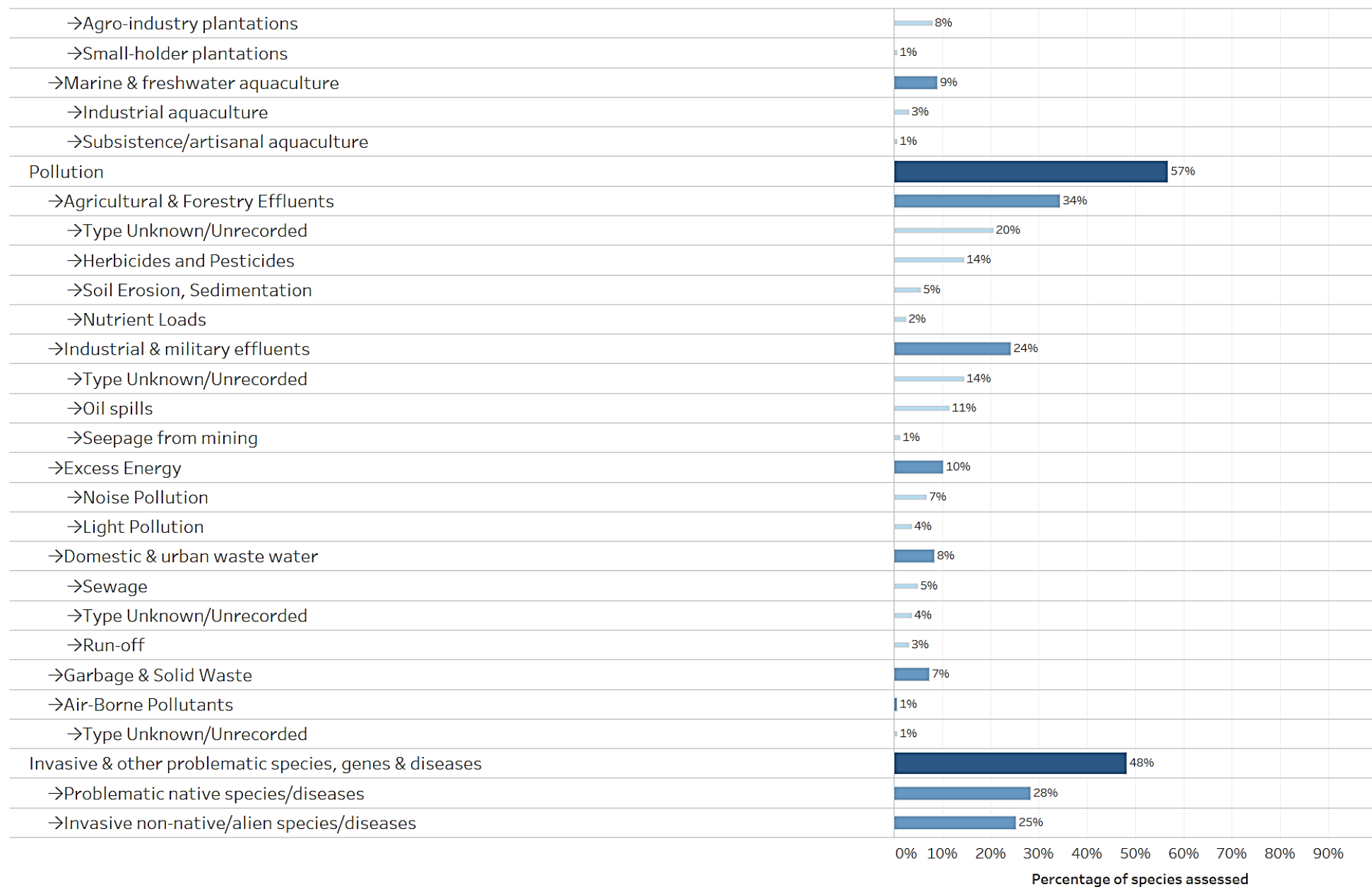
Threats as categorized and defined by the IUCN – CMP Unified Classification of Direct Threats have been extracted from Red List Assessments for Appendix I-listed species whenever available¹. All three levels defined by the IUCN hierarchical classification scheme have been considered. A total of 166 species had information about threats available. Threat categories have been extracted from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated in Appendix I for some species. The percentage of the main threats does not reflect the sum of the subcategories' values because one species can be assessed for more than one threat category.

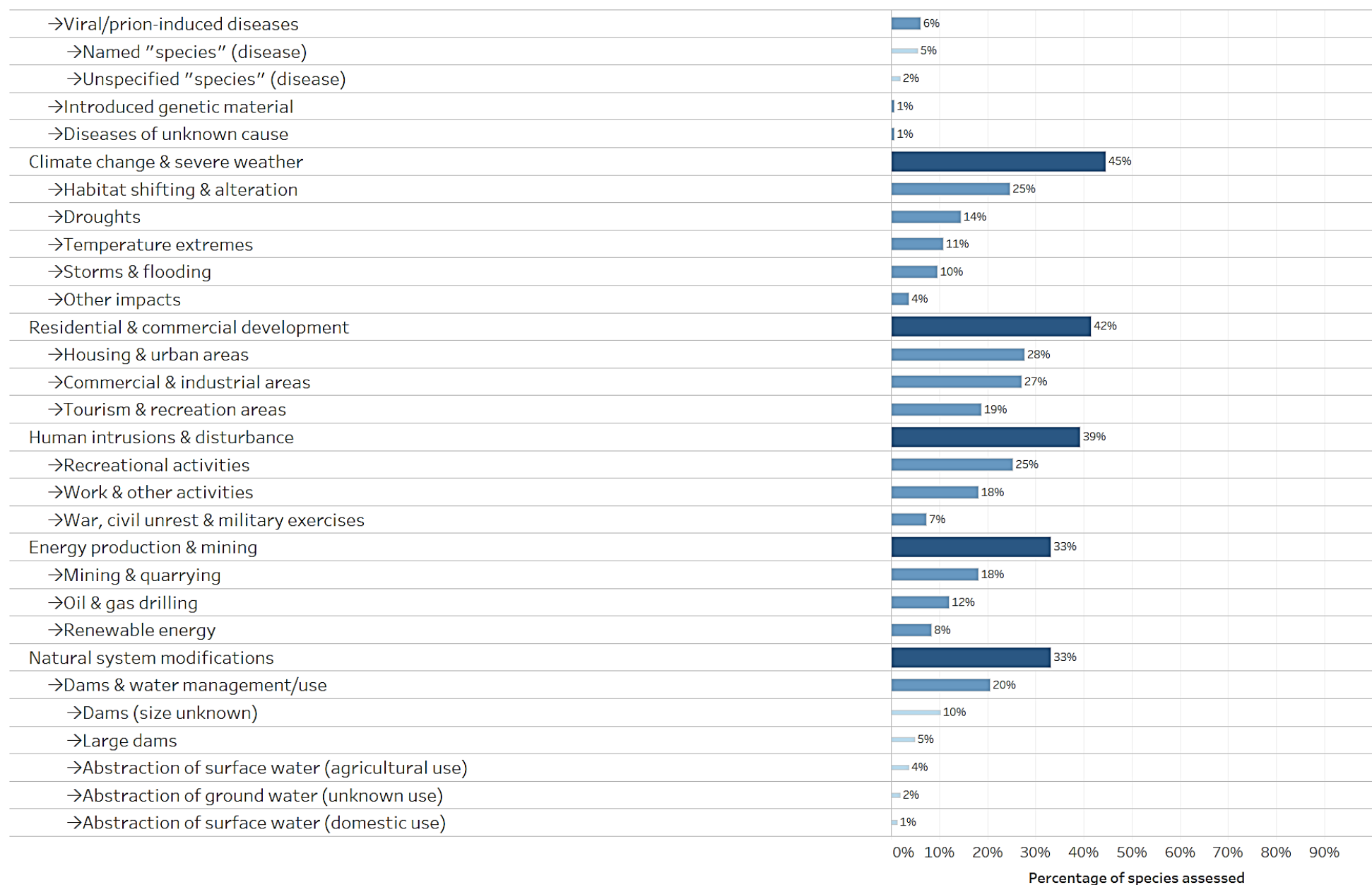
Fig. 5 shows the percentage of species impacted by kind of threat. Biological resource use impacts 159 species (96%); agriculture and aquaculture affect 97 species (58%); pollution 94 species (57%); invasive and other problematic species, genes and diseases 80 species (48%); climate change and severe weather 74 species (45%).

Fig. 6 shows the percentage of species in the four main taxonomic groups, impacted by main categories of threat. Specific threats by taxonomic group are shown in table 1.

¹ According to the *Rules of Procedure for IUCN Red List Assessments 2017–2020*, codification for threats is not a required supporting information for all assessments, it is required only for taxa assessed as Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, and Near Threatened.

Fig 5. Percentage of species listed on Appendix I impacted, by kind of threat






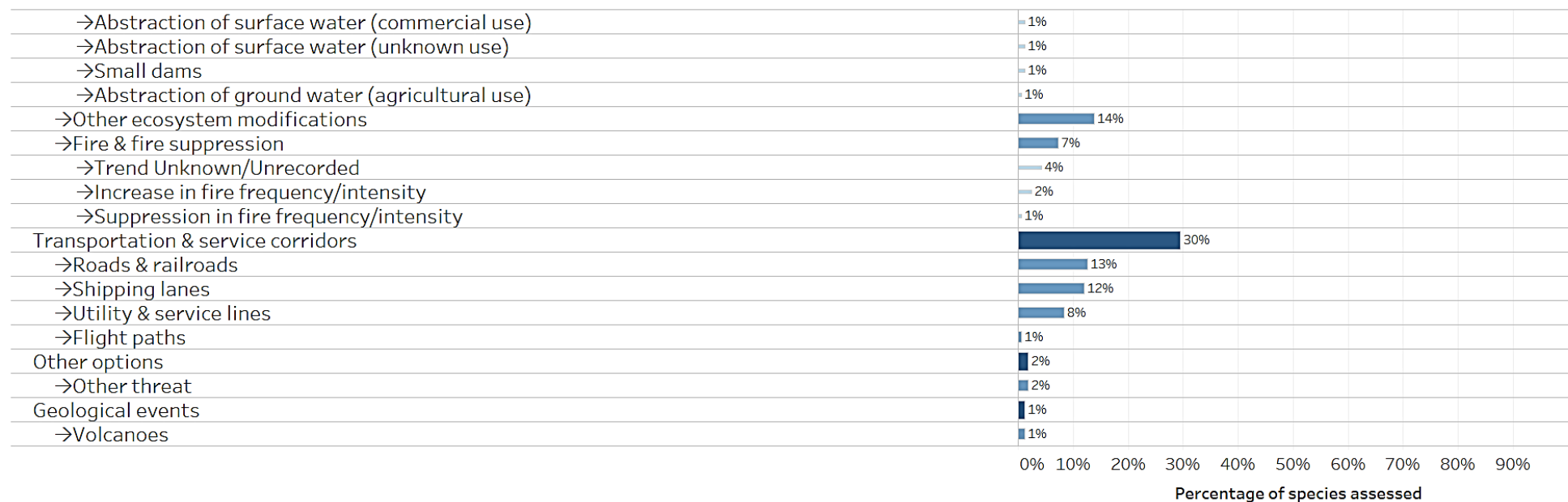
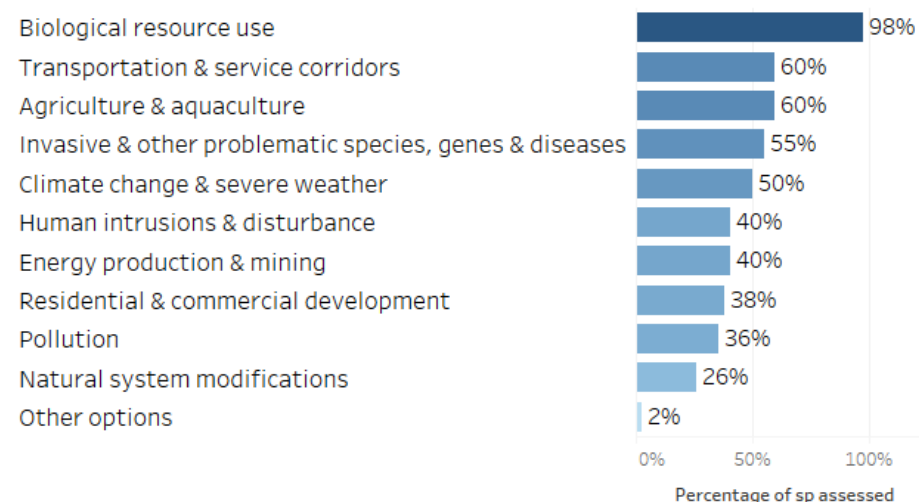
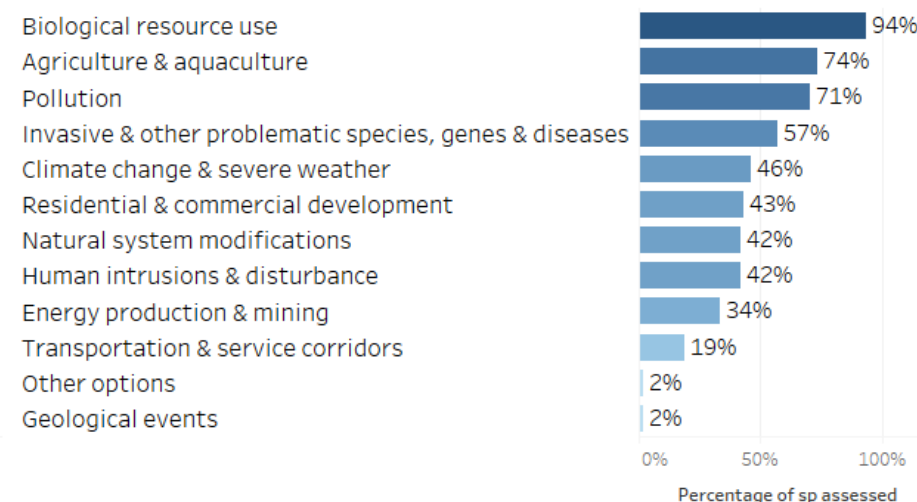


Fig. 6 Percentage of Appendix I-listed species in each taxonomic group impacted, by main categories of threat

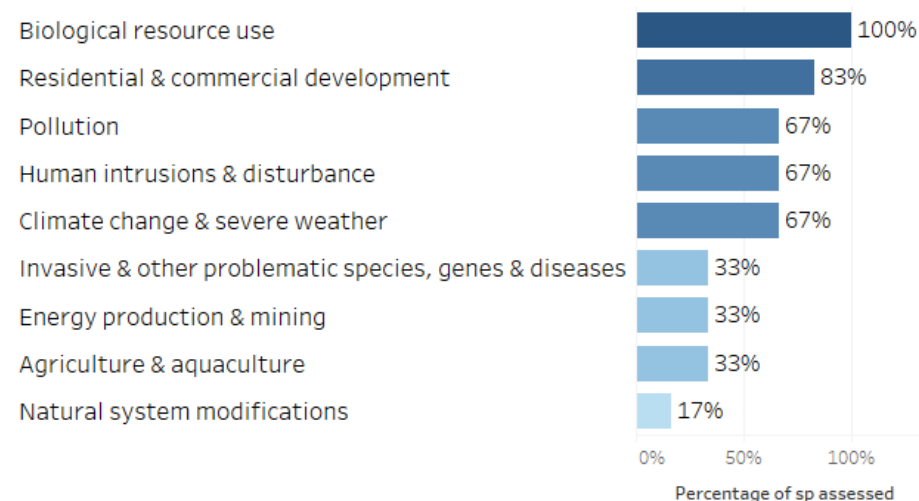
Appendix I/ Mammalia - Main threats



Appendix I/Aves - Main threats



Appendix I/Reptilia - Main threats



Appendix I/Pisces - Main threats

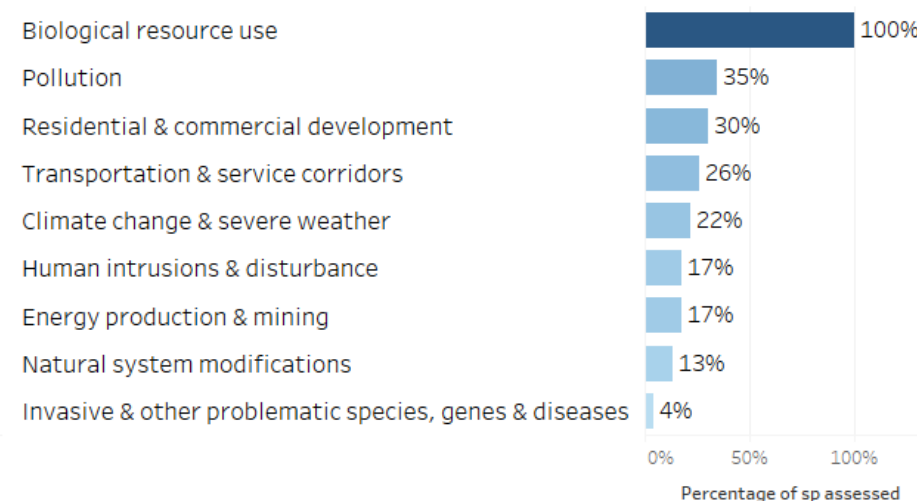


Table 1. Percentage of Appendix I-listed species in each taxonomic group impacted, by kind of threat.

	Group			
	Mammalia	Aves	Reptilia	Pisces
Biological resource use	98%	94%	100%	100%
→Hunting & collecting terrestrial animals	52%	82%	17%	
→Intentional use (species being assessed is the target)	52%	73%	17%	
→Unintentional effects (species being assessed is not the target)	12%	24%		
→Persecution/control	17%	22%		
→Fishing & harvesting aquatic resources	50%	29%	100%	100%
→Unintentional effects: large scale (species being assessed is not the target)[harvest]	38%	17%	67%	96%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	14%	18%	67%	78%
→Intentional use: subsistence/small scale (species being assessed is the target)[harvest]	24%		67%	74%
→Intentional use: large scale (species being assessed is the target)[harvest]	31%		33%	57%
→Persecution/control	10%			22%
→Motivation Unknown/Unrecorded	7%			4%
→Logging & wood harvesting	19%	19%		4%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	7%	14%		
→Unintentional effects: large scale (species being assessed is not the target)[harvest]	10%	7%		
→Motivation Unknown/Unrecorded	10%			4%
→Gathering terrestrial plants		5%		
→Unintentional effects (species being assessed is not the target)		5%		
Agriculture & aquaculture	60%	74%	33%	
→Annual & perennial non-timber crops	31%	66%	17%	
→Agro-industry farming	19%	49%		
→Small-holder farming	24%	21%		
→Shifting agriculture	10%	4%	17%	
→Scale Unknown/Unrecorded	5%	4%		
→Livestock farming & ranching	43%	34%		
→Small-holder grazing, ranching or farming	26%	23%		
→Nomadic grazing	36%	3%		
→Agro-industry grazing, ranching or farming	7%	16%		
→Scale Unknown/Unrecorded	2%	4%		
→Wood & pulp plantations	10%	17%		

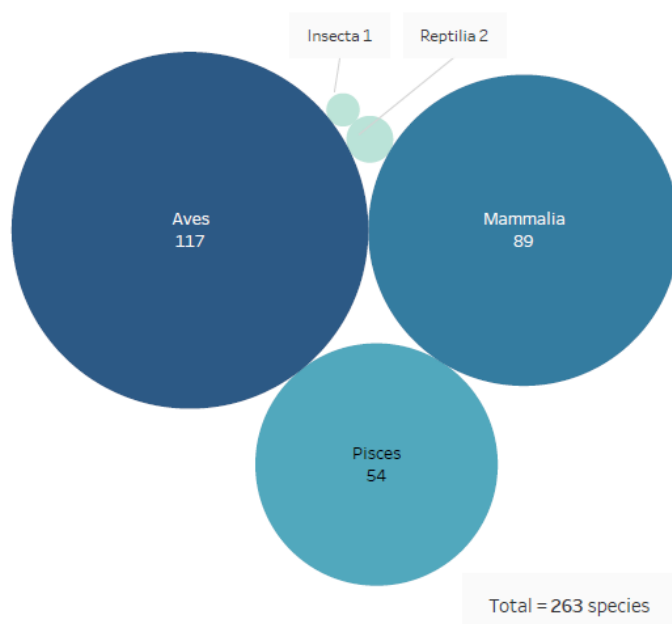
	Group			
	Mammalia	Aves	Reptilia	Pisces
→Agro-industry plantations	7%	11%		
→Scale Unknown/Unrecorded	2%	6%		
→Small-holder plantations	2%			
→Marine & freshwater aquaculture	7%	12%	17%	
→Scale Unknown/Unrecorded	7%	7%		
→Industrial aquaculture		4%	17%	
→Subsistence/artisanal aquaculture			17%	
Pollution	36%	71%	67%	35%
→Agricultural & Forestry Effluents	21%	46%		17%
→Type Unknown/Unrecorded	12%	31%		
→Herbicides and Pesticides	7%	21%		4%
→Soil Erosion, Sedimentation	7%	2%		17%
→Nutrient Loads	2%			13%
→Industrial & military effluents	24%	26%	33%	13%
→Type Unknown/Unrecorded	17%	17%	17%	
→Oil spills	14%	9%	17%	13%
→Seepage from mining				9%
→Excess Energy	26%	4%	33%	
→Noise Pollution	26%			
→Light Pollution		4%	33%	
→Domestic & urban waste water	17%	3%	17%	13%
→Sewage	10%		17%	13%
→Type Unknown/Unrecorded	7%	3%		
→Run-off	5%			13%
→Garbage & Solid Waste	14%	3%	33%	4%
→Air-Borne Pollutants		1%		
→Type Unknown/Unrecorded		1%		
Invasive & other problematic species, genes & diseases	55%	57%	33%	4%
→Problematic native species/diseases	45%	27%	17%	4%
→Named species	2%	18%		

	Group			
	Mammalia	Aves	Reptilia	Pisces
→Unspecified species	10%	1%		
→Invasive non-native/alien species/diseases	21%	35%		
→Named species	17%	31%		
→Unspecified species	7%	6%		
→Viral/prion-induced diseases	10%	5%	17%	
→Named "species" (disease)	7%	5%	17%	
→Unspecified "species" (disease)	7%			
→Introduced genetic material	2%			
→Diseases of unknown cause	2%			
Climate change & severe weather	50%	46%	67%	22%
→Habitat shifting & alteration	31%	22%	33%	22%
→Droughts	21%	16%		
→Temperature extremes	10%	6%	50%	22%
→Storms & flooding	7%	12%	33%	
→Other impacts	2%	4%	17%	
Residential & commercial development	38%	43%	83%	30%
→Housing & urban areas	33%	27%	33%	17%
→Commercial & industrial areas	21%	27%	50%	30%
→Tourism & recreation areas	24%	14%	83%	13%
Human intrusions & disturbance	40%	42%	67%	17%
→Recreational activities	26%	25%	50%	17%
→Work & other activities	12%	23%	50%	
→War, civil unrest & military exercises	24%	2%		
Energy production & mining	40%	34%	33%	17%
→Mining & quarrying	26%	16%	17%	13%
→Oil & gas drilling	17%	11%	17%	9%
→Renewable energy		15%		
Natural system modifications	26%	42%	17%	13%
→Dams & water management/use	19%	23%	17%	13%
→Dams (size unknown)	17%	7%	17%	9%

	Mammalia	Group Aves	Pisces
→Large dams	2%	6%	4%
→Abstraction of surface water (agricultural use)	2%	4%	4%
→Abstraction of ground water (unknown use)	5%	1%	
→Abstraction of surface water (domestic use)	2%	1%	
→Abstraction of surface water (commercial use)	2%	1%	
→Abstraction of surface water (unknown use)		2%	
→Small dams	2%	1%	
→Abstraction of ground water (agricultural use)		1%	
→Other ecosystem modifications	14%	18%	
→Fire & fire suppression	7%	9%	
→Trend Unknown/Unrecorded	7%	4%	
→Increase in fire frequency/intensity		4%	
→Suppression in fire frequency/intensity		1%	
Transportation & service corridors	60%	19%	26%
→Roads & railroads	24%	11%	4%
→Shipping lanes	36%		22%
→Utility & service lines	2%	14%	
→Flight paths		1%	
Other options	2%	2%	
→Other threat	2%	2%	
Geological events		2%	
→Volcanoes		2%	

APPENDIX II

Appendix II-listed species by taxonomic group



CMS Appendix II includes 263 taxa at the species or sub-species levels, of which 89 mammals, 117 birds, 2 reptiles, 54 fish and 1 insect. (Fig.7)

Fig 7. Species and subspecies listed on Appendix II by broad taxonomic category

Conservation status

IUCN Red List categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated on Appendix II for some species. Of the species listed on Appendix II (Fig. 8), one (<1%) is assessed as 'Extinct in the Wild'; 26 (10%) are assessed as 'Critically Endangered'; 28 (11%) as 'Endangered'; 57 (22%) as 'Vulnerable'; 31 (12%) as 'Near Threatened'. Hence a total of 143 species, i.e. ca. 54% of all migratory species listed on Appendix II, can be considered as being of significant global concern. Of the remaining 120 species, 85 (32%) are assessed as 'Least Concern'; 12 (5%) as 'Data Deficient' and 1 species (insect) was considered 'Not Applicable' to the assessment process. For 22 species (8%) no assessment is available in the Red List database and are classified in this analysis as 'Species not assessed'.

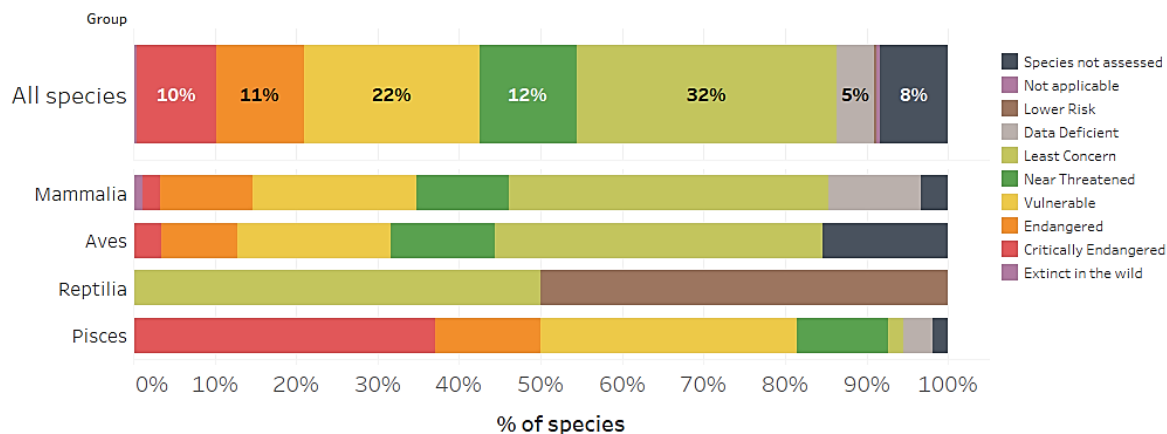


Fig. 8 Percentage of Appendix-II listed species in IUCN Red List Categories

According to the CMS Guidelines for assessment of Appendix I and II listing proposals, a taxon assessed as 'Extinct in the Wild', 'Critically Endangered', 'Endangered', 'Vulnerable' or 'Near Threatened' using the IUCN Red List criteria is eligible for consideration for listing on Appendix II, recognizing that such taxa meet the definition of 'unfavourable conservation status' under the Convention. A taxon assessed as 'Data Deficient' should be evaluated in terms of the merit of any individual Appendix II proposal.

Of the species currently listed on Appendix II, 155 (59%) can meet the criteria for listing on the Appendix (Fig. 9)

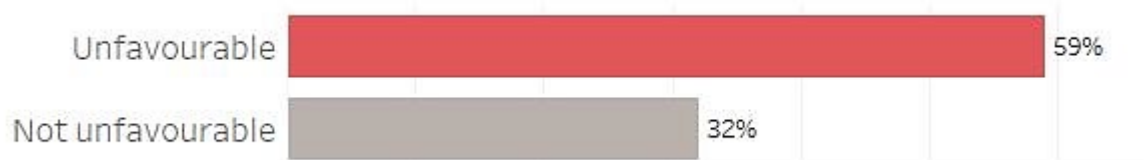


Fig.9 Percentage of Appendix II-listed species meeting the criteria for listing on Appendix II defined in Res.11.33 (Rev.COP12) as regards conservation status

Population Trends.

Population trends categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated in Appendix I for some species. The current population trend for 126 species (48%) listed on Appendix II is 'Decreasing' (Fig. 10); for 27 species (10%) is 'Stable'; for 20 species (8%) is 'Increasing'; for 64 species (24%) is 'Unknown'; for 3 species (1%) is 'Unspecified'. For 22 species (8%) no information on population trends were found in the Red List database and are classified in this analysis as 'Species not assessed'.

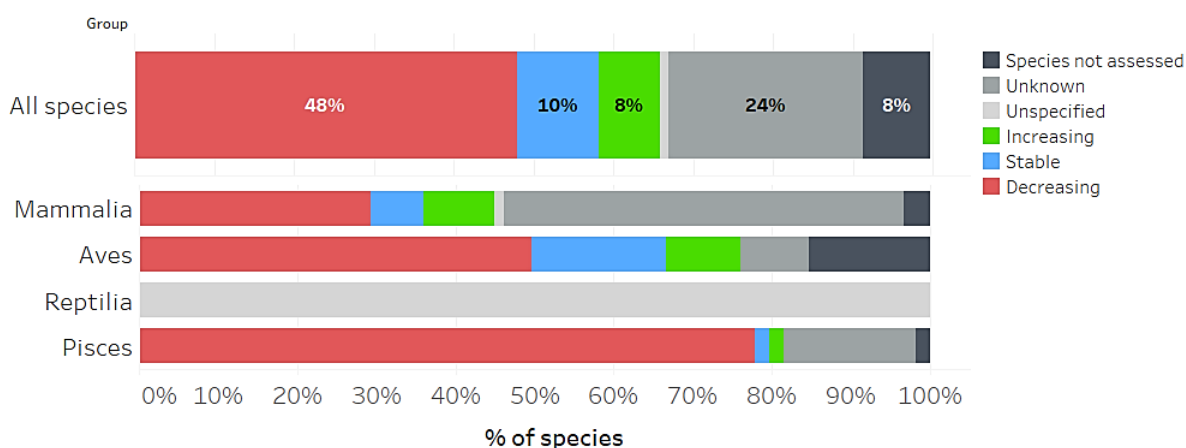


Fig 10. Population trends for species listed on Appendix II

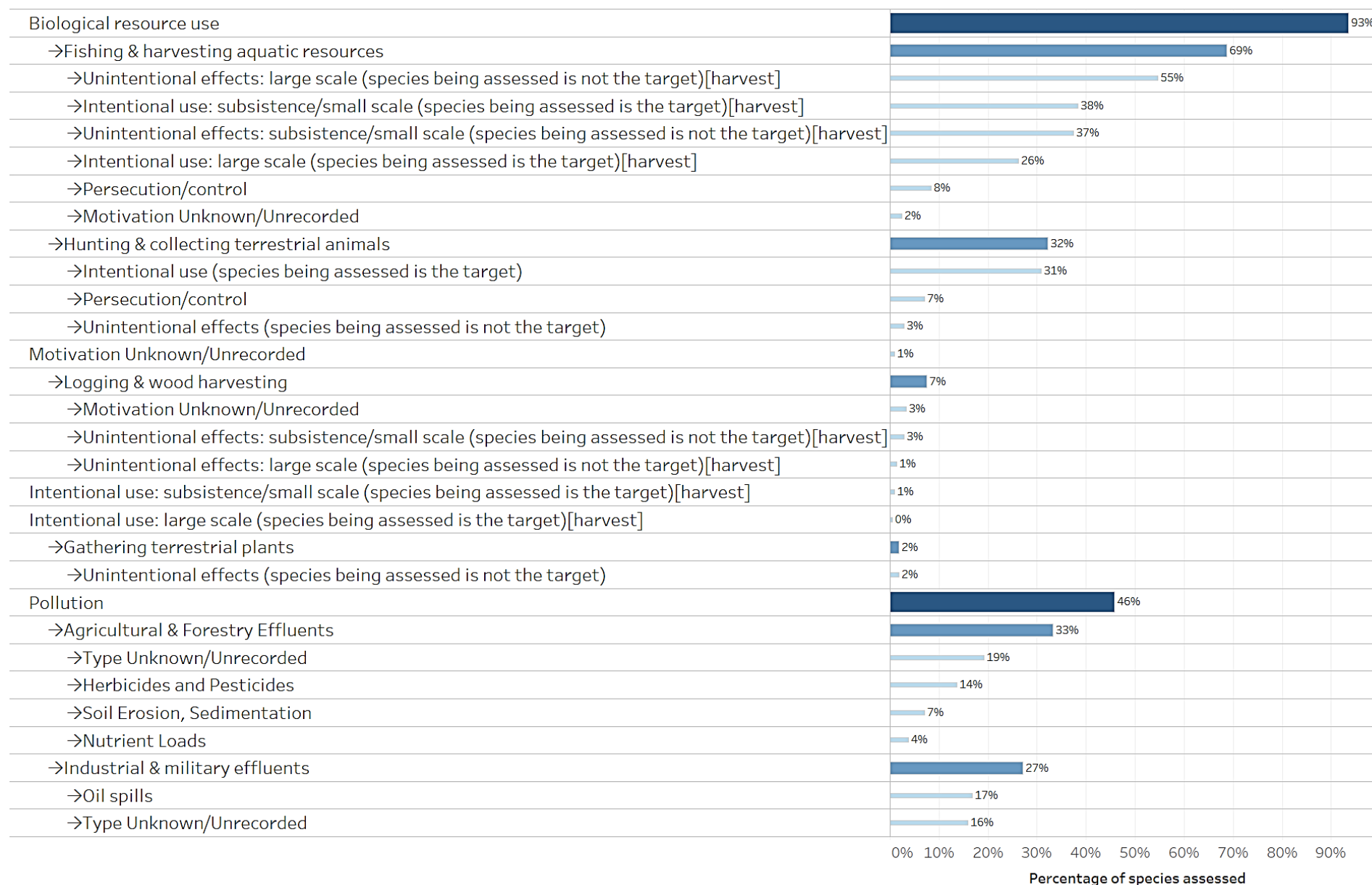
Main threats affecting species listed on Appendix II

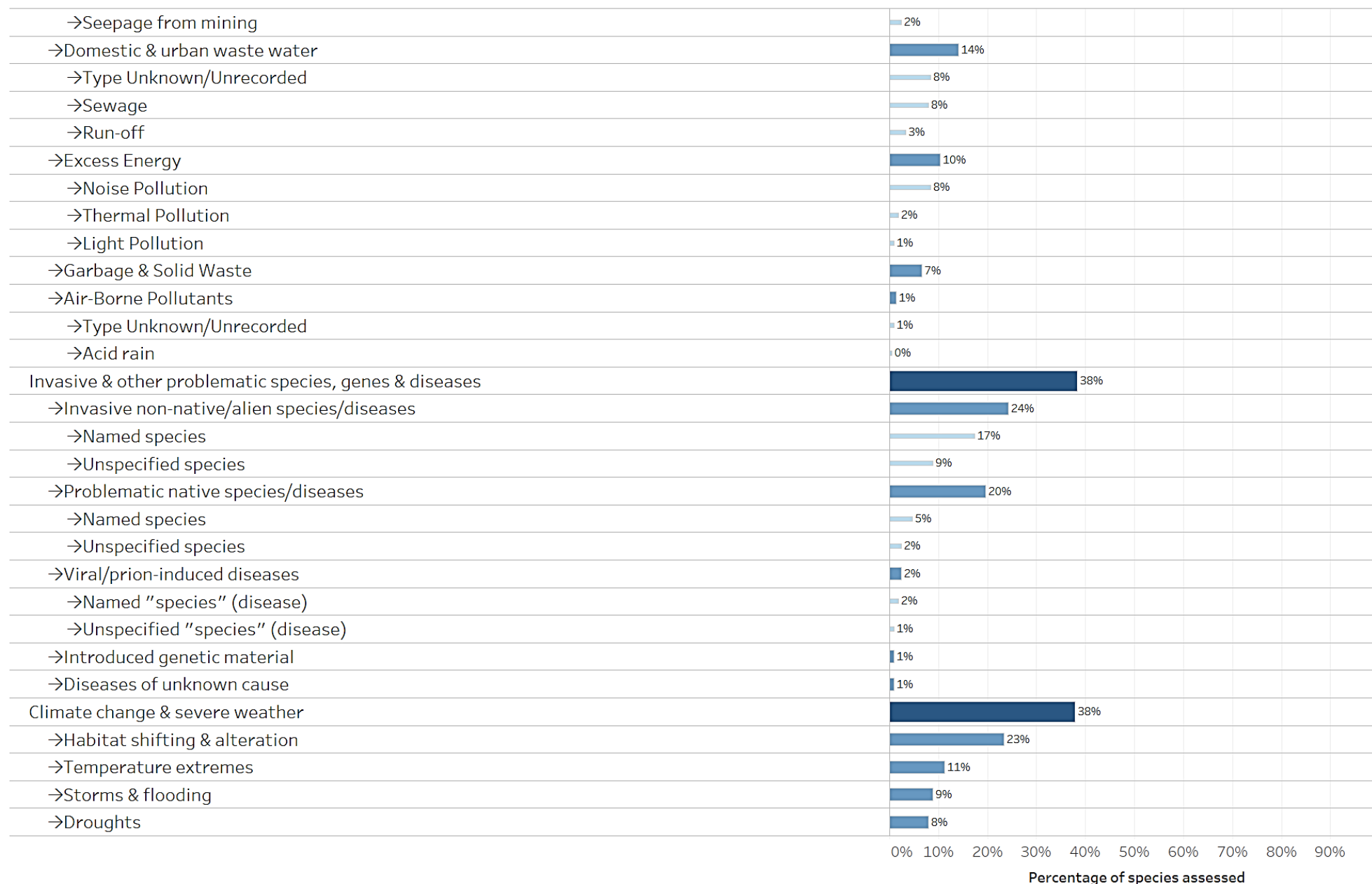
Threats as categorized and defined by the IUCN – CMP Unified Classification of Direct Threats have been extracted from Red List Assessments for Appendix II listed species whenever available². All three levels defined by the IUCN hierarchical classification scheme have been considered. A total of 214 species had information about threats available. Threat categories have been extracted from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated on Appendix II for some species.

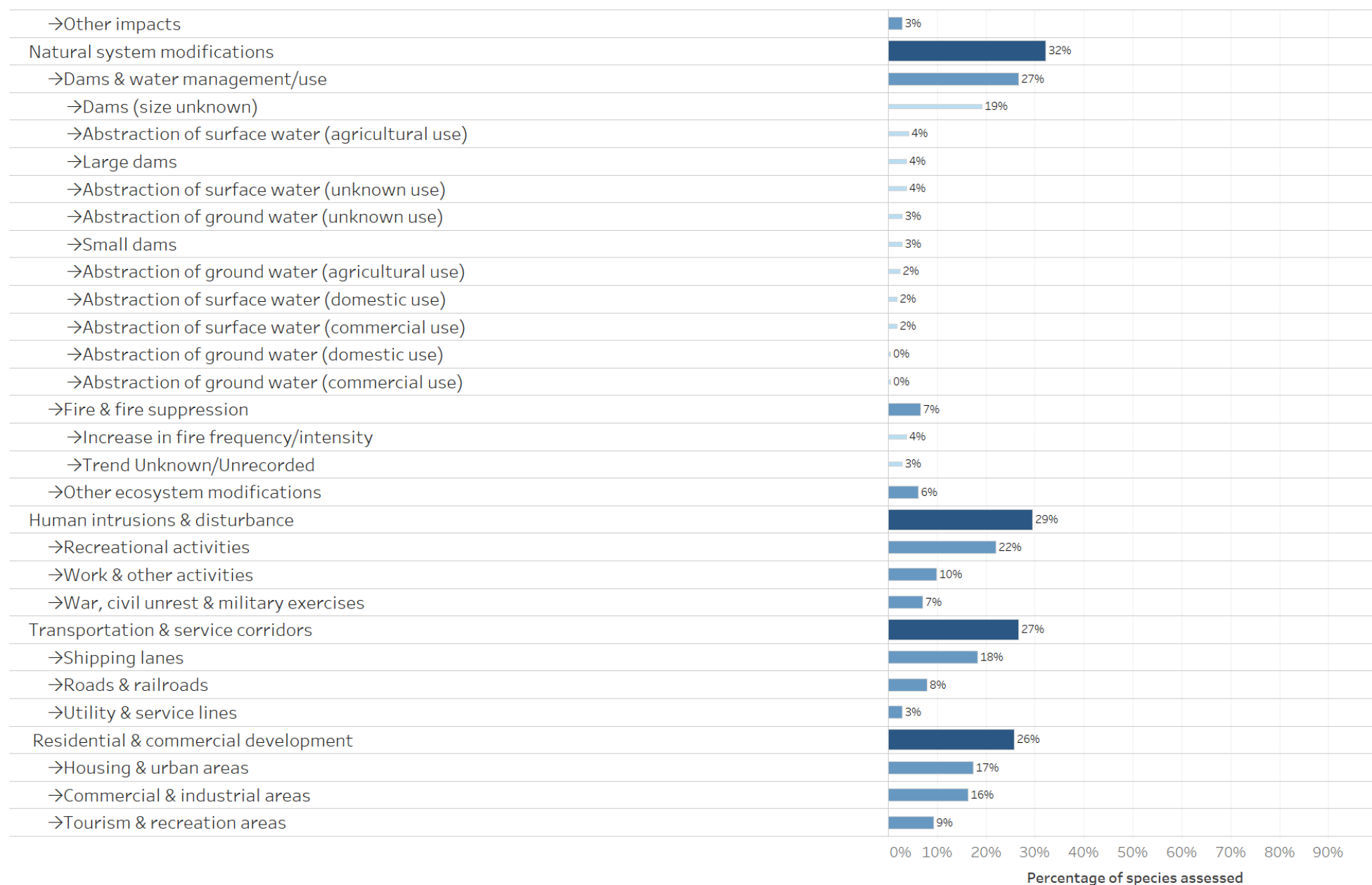
Figure 11 shows the percentage of species impacted by kind of threat. Biological resource use impacts 200 species (93%); pollution is affecting 98 species (46%); invasive & other problematic species, genes and diseases 82 species (38%); climate change & severe weather 81 species (38%); the modification of natural systems, which is, the changes to natural processes such as fire, hydrology and sedimentation affects 69 species (32%).

Fig. 12 show the percentage of the main four taxonomic groups, impacted by the main kind of threat. This information is not presented for reptiles because there is no information on the threats of the two species listed in Appendix II. Specific threats by taxonomic group are shown in table 2.

² According to the *Rules of Procedure for IUCN Red List Assessments 2017–2020*, codification for threats is not a required supporting information for all assessments, it is required only for taxa assessed as Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, and Near Threatened.

Fig. 11 Percentage of species listed on Appendix II impacted, by kind of threat






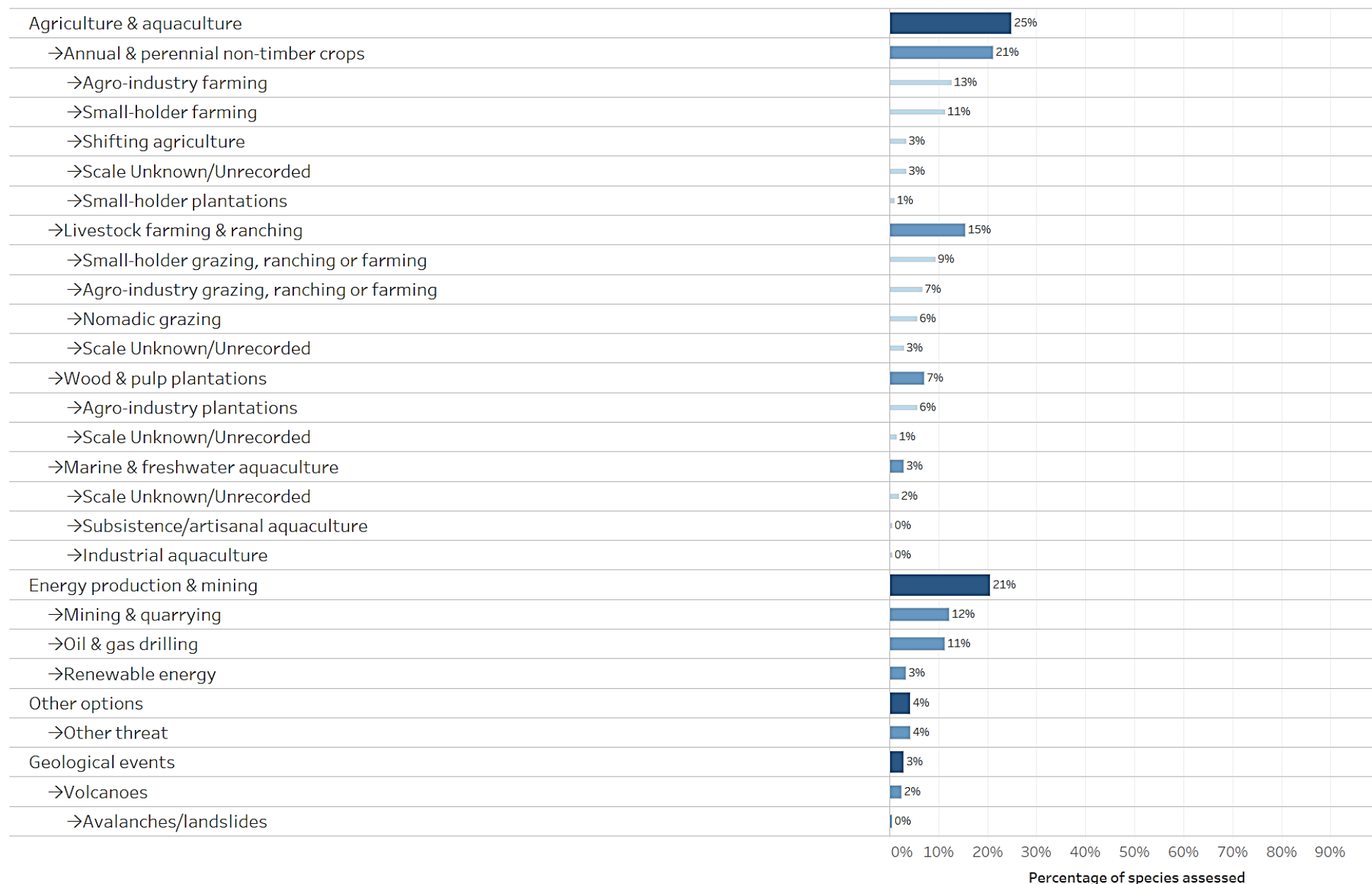
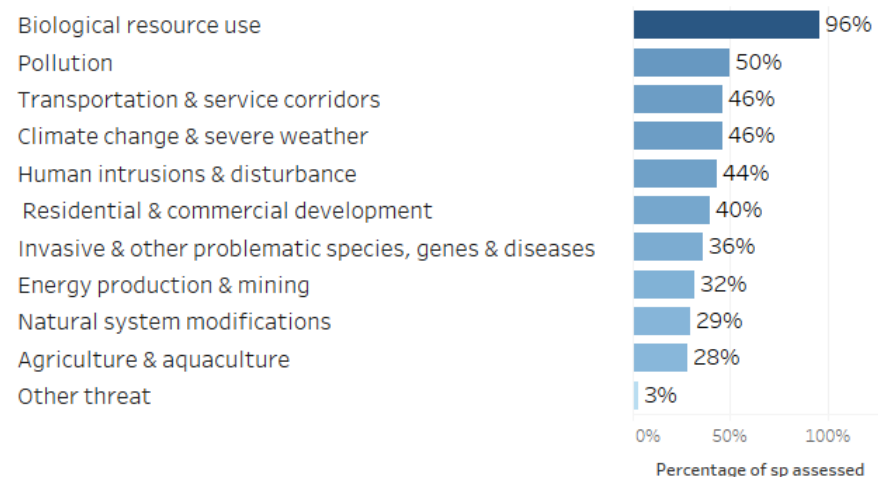
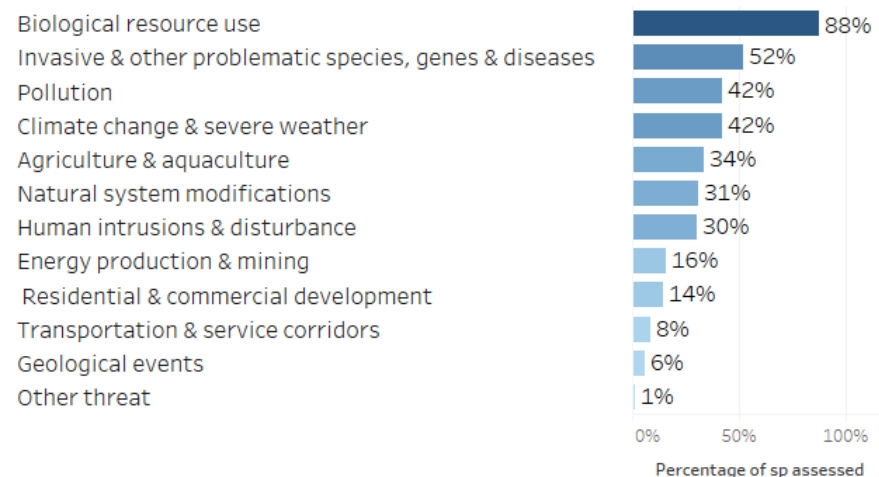


Fig. 12 Percentage of species listed on Appendix II in each taxonomic group impacted, by main kind of threat

Appendix II/Mammalia listed - Main threats



Appendix II/Aves listed - Main threats



Appendix II/Pisces listed - Main threats

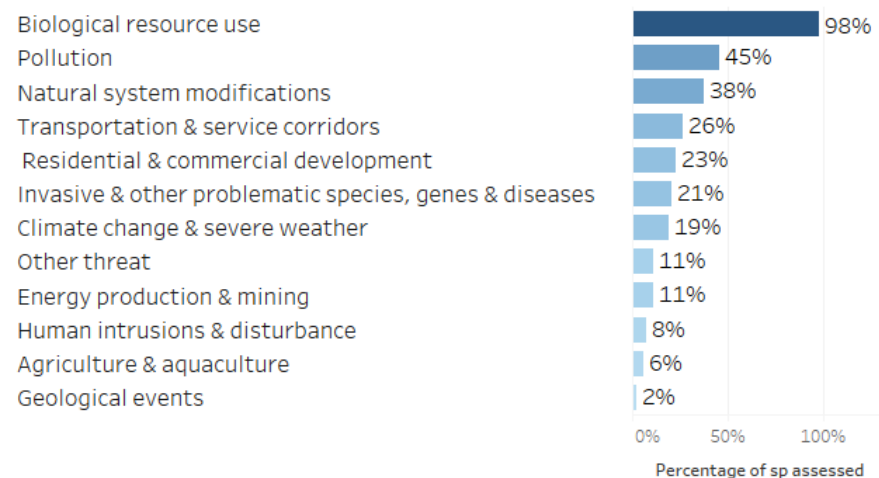


Table 2. Percentage of species listed in each taxonomic group on Appendix II impacted, by kind of threat.

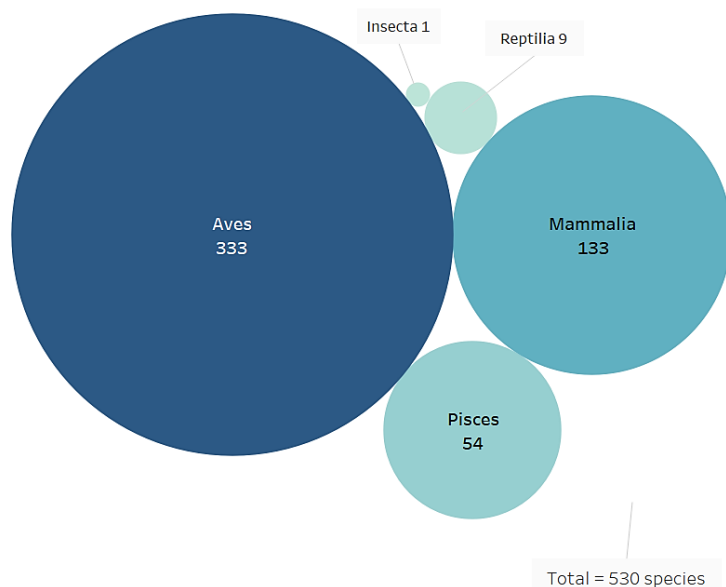
	Aves	Group Mammalia	Pisces
Biological resource use	88%	96%	98%
→Fishing & harvesting aquatic resources	49%	69%	98%
→Unintentional effects: large scale (species being assessed is not the target)[harvest]	43%	47%	83%
→Intentional use: subsistence/small scale (species being assessed is the target)[harvest]		51%	79%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	16%	33%	77%
→Intentional use: large scale (species being assessed is the target)[harvest]		29%	62%
→Persecution/control		12%	17%
→Motivation Unknown/Unrecorded		5%	2%
→Hunting & collecting terrestrial animals	59%	24%	2%
→Intentional use (species being assessed is the target)	57%	24%	
→Persecution/control	10%	9%	
→Unintentional effects (species being assessed is not the target)	1%	6%	
→Motivation Unknown/Unrecorded	1%		2%
→Logging & wood harvesting	4%	13%	6%
→Motivation Unknown/Unrecorded		8%	2%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	4%	4%	
→Unintentional effects: large scale (species being assessed is not the target)[harvest]		3%	2%
→Intentional Use: subsistence/small scale (species being assessed is the target)		3%	
→Intentional Use: large scale (species being assessed is the target)			2%
→Gathering terrestrial plants	5%		
→Unintentional effects (species being assessed is not the target)	5%		
Pollution	42%	50%	45%
→Agricultural & Forestry Effluents	27%	41%	32%
→Type Unknown/Unrecorded	12%	26%	21%
→Herbicides and Pesticides	14%	15%	9%
→Soil Erosion, Sedimentation	4%	4%	17%
→Nutrient Loads	1%	4%	8%
→Industrial & military effluents	14%	37%	32%
→Oil spills	12%	19%	21%
→Type Unknown/Unrecorded	2%	26%	23%

	Group		
	Aves	Mammalia	Pisces
→Herbicides and Pesticides	14%	15%	9%
→Soil Erosion, Sedimentation	4%	4%	17%
→Nutrient Loads	1%	4%	8%
→Industrial & military effluents	14%	37%	32%
→Oil spills	12%	19%	21%
→Type Unknown/Unrecorded	2%	26%	23%
→Seepage from mining		3%	6%
→Domestic & urban waste water	1%	22%	23%
→Type Unknown/Unrecorded	1%	14%	11%
→Sewage		9%	19%
→Run-off		4%	8%
Excess Energy	1%	22%	8%
→Noise Pollution		22%	2%
→ Thermal Pollution			8%
→Light Pollution	1%		2%
→Garbage & Solid Waste	5%	6%	9%
→Air-Borne Pollutants	1%		4%
→Type Unknown/Unrecorded	1%		2%
→ Acid rain			2%
Invasive & other problematic species, genes & diseases	52%	36%	21%
→Invasive non-native/alien species/diseases	41%	12%	17%
→Named species	37%	4%	6%
→Unspecified species	5%	8%	17%
→Problematic native species/diseases	16%	29%	11%
→Named species	11%		2%
→Unspecified species	2%	4%	
→Viral/prion-induced diseases	4%	3%	
→Named "species" (disease)	4%	1%	
→Unspecified "species" (disease)		3%	
→Introduced genetic material		1%	2%

	Aves	Groupe Mammalia	Pisces
→Diseases of unknown cause		3%	
Climate change & severe weather	42%	46%	19%
→Habitat shifting & alteration	22%	33%	11%
→Temperature extremes	7%	14%	13%
→Storms & flooding	16%	6%	2%
→Droughts	4%	14%	6%
→Other impacts	2%	4%	2%
Natural system modifications	31%	29%	38%
→Dams & water management/use	24%	22%	38%
→Dams (size unknown)	14%	14%	34%
→Abstraction of surface water (agricultural use)	5%	4%	4%
→Large dams	2%	5%	4%
→Abstraction of surface water (unknown use)	10%		
→Abstraction of ground water (unknown use)	1%	4%	4%
→Small dams	1%	5%	2%
→Abstraction of ground water (agricultural use)	1%		8%
→Abstraction of surface water (domestic use)		4%	2%
→Abstraction of surface water (commercial use)		4%	2%
→Abstraction of ground water (domestic use)			2%
→Abstraction of ground water (commercial use)			2%
→Fire & fire suppression	11%	6%	
→Increase in fire frequency/intensity	7%	3%	
→Trend Unknown/Unrecorded	4%	4%	
→Other ecosystem modifications	7%	9%	
Human intrusions & disturbance	30%	44%	8%
→Recreational activities	23%	31%	8%
→Work & other activities	13%	13%	
→War, civil unrest & military exercises	4%	15%	
Transportation & service corridors	8%	46%	26%
→Shipping lanes	2%	32%	23%

	Aves	Group Mammalia	Pisces
→Roads & railroads	5%	14%	4%
→Utility & service lines	5%	1%	2%
Residential & commercial development	14%	40%	23%
→Housing & urban areas	10%	28%	13%
→Commercial & industrial areas	2%	28%	21%
→Tourism & recreation areas	6%	14%	8%
Agriculture & aquaculture	34%	28%	6%
→Annual & perennial non-timber crops	33%	19%	6%
→Agro-industry farming	20%	10%	4%
→Small-holder farming	13%	15%	2%
→Shifting agriculture	4%	5%	
→Scale Unknown/Unrecorded	5%	3%	2%
→Small-holder plantations		3%	
→Livestock farming & ranching	20%	18%	4%
→Small-holder grazing, ranching or farming	11%	14%	
→Agro-industry grazing, ranching or farming	11%	5%	2%
→Nomadic grazing	1%	14%	
→Scale Unknown/Unrecorded	5%	1%	2%
→Wood & pulp plantations	13%	4%	2%
→Agro-industry plantations	10%	4%	2%
→Scale Unknown/Unrecorded	4%		
→Marine & freshwater aquaculture		6%	2%
→Scale Unknown/Unrecorded		4%	2%
→Subsistence/artisanal aquaculture		1%	
→Industrial aquaculture		1%	
Energy production & mining	16%	32%	11%
→Mining & quarrying	10%	18%	8%
→Oil & gas drilling	5%	22%	6%
→Renewable energy	5%	3%	2%
Other threat	1%	3%	11%
→Other threat	1%	3%	11%
Geological events	6%		2%
→Volcanoes	5%		2%
→Avalanches/Landslides	1%		

Species listed and covered on Appendix II



Fi
broad taxonomic category

In addition to taxa at the species and subspecies levels, Appendix II lists 2 mammal families, 63 bird families, 3 bird genera and 2 reptile families. A conservative selection of the species covered under the families and genera listed was made, considering covered those species included in a CMS Art. IV Agreement and/or included also on Appendix I.

The two families of mammals contained on Appendix II are bats of the order Chiroptera. Species covered by the EUROBATS Agreement were considered covered by the families, with the exclusion of those species endemic to a single country.

The disaggregation of the bird families and genera used data from the Handbook of the Birds of the World.

A total of 267 species were selected, of which 115 are included in AEWA, 79 in the Raptors MOU, 44 in the EUROBATS Agreement, 27 in CMS Appendix I, 1 in the IOSEA MOU and 1 in the Aquatic Warbler MOU

In total, 530 species are listed and covered on Appendix II, of which 133 mammals, 333 birds, 9 reptiles, 54 fish and 1 insect (Fig. 13)

Conservation status

IUCN Red List categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated on Appendix II for some species. Of the species listed and covered on Appendix II (Fig. 14), one (<1%) is assessed as 'Extinct in the Wild'; 41 (8%) are assessed as 'Critically Endangered'; 44 (8%) as 'Endangered'; 86 (16%) as 'Vulnerable'; 56 (11%) as 'Near Threatened'. Hence a total of 228 species, i.e. ca.43% of all species listed or covered under Appendix II can be considered as being of significant global concern. Of the remaining 302 species, 259 (49%) are assessed as 'Least Concern'; 17 (3%) as 'Data Deficient'; 1 species (insect) was considered 'Not Applicable' to the assessment process. For 25 species (5%) no assessment is available in the Red List database and are classified in this analysis as 'Species not assessed'.

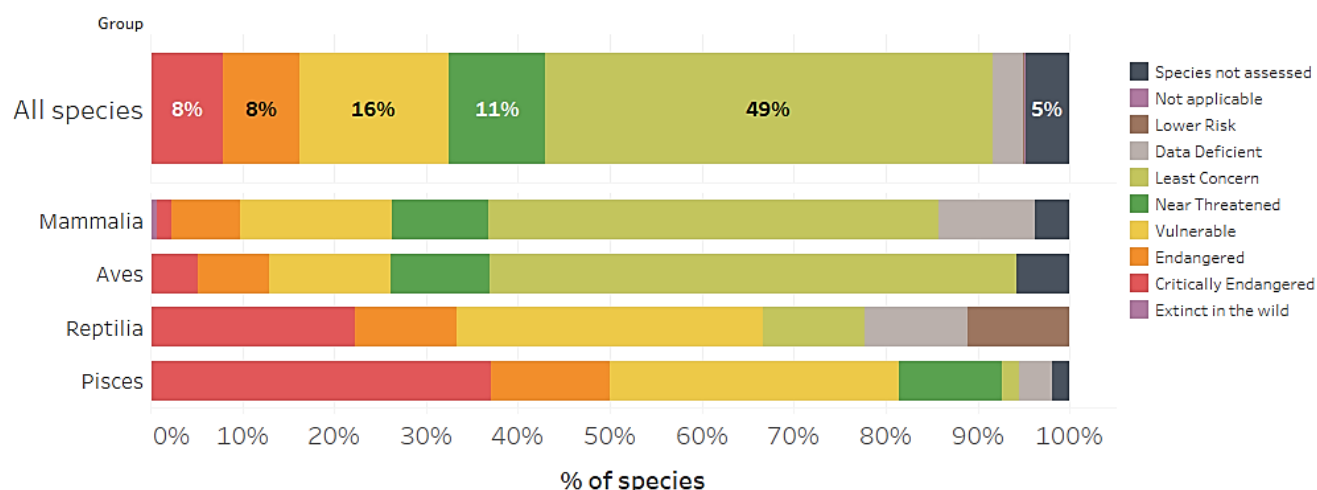


Fig. 14 Percentage of species in IUCN Red List Categories listed and covered on Appendix II

Of the 530 species listed and covered on Appendix II, 245 species (46%) can meet the definition of 'unfavourable conservation status' (Fig. 15).

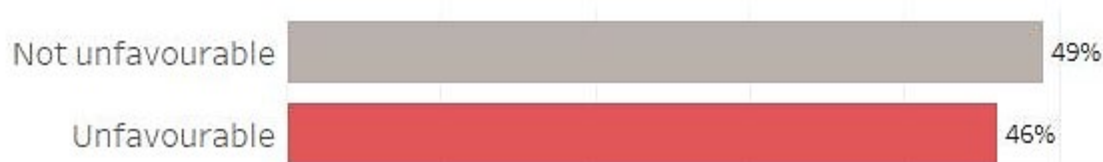


Fig. 15 Percentage of species listed and covered on Appendix II meeting the criteria for listing on Appendix II defined in Res.11.33 (Rev.COP12)

Population Trends.

Population trends categories have been selected from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated in Appendix I for some species. The current population trend for 261 species (49%) listed and covered on Appendix II is 'Decreasing' (Fig. 14); for 75 species (14%) is 'Stable'; for 52 species (10%) is 'Increasing'; for 111 species (21%) is 'Unknown'; for 5 species (1%) is 'Unspecified'. For 25 species (5%) no information on population trends were found in the Red List database and are classified in this analysis as 'Species not assessed'.

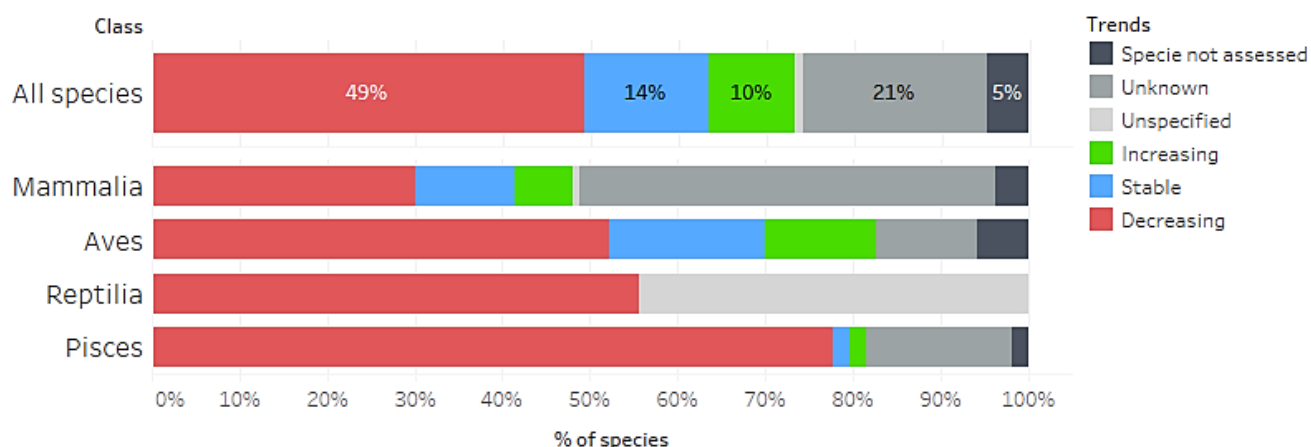


Fig. 16 Population trend of species listed and covered on Appendix II

Main threats affecting species listed and covered on Appendix II

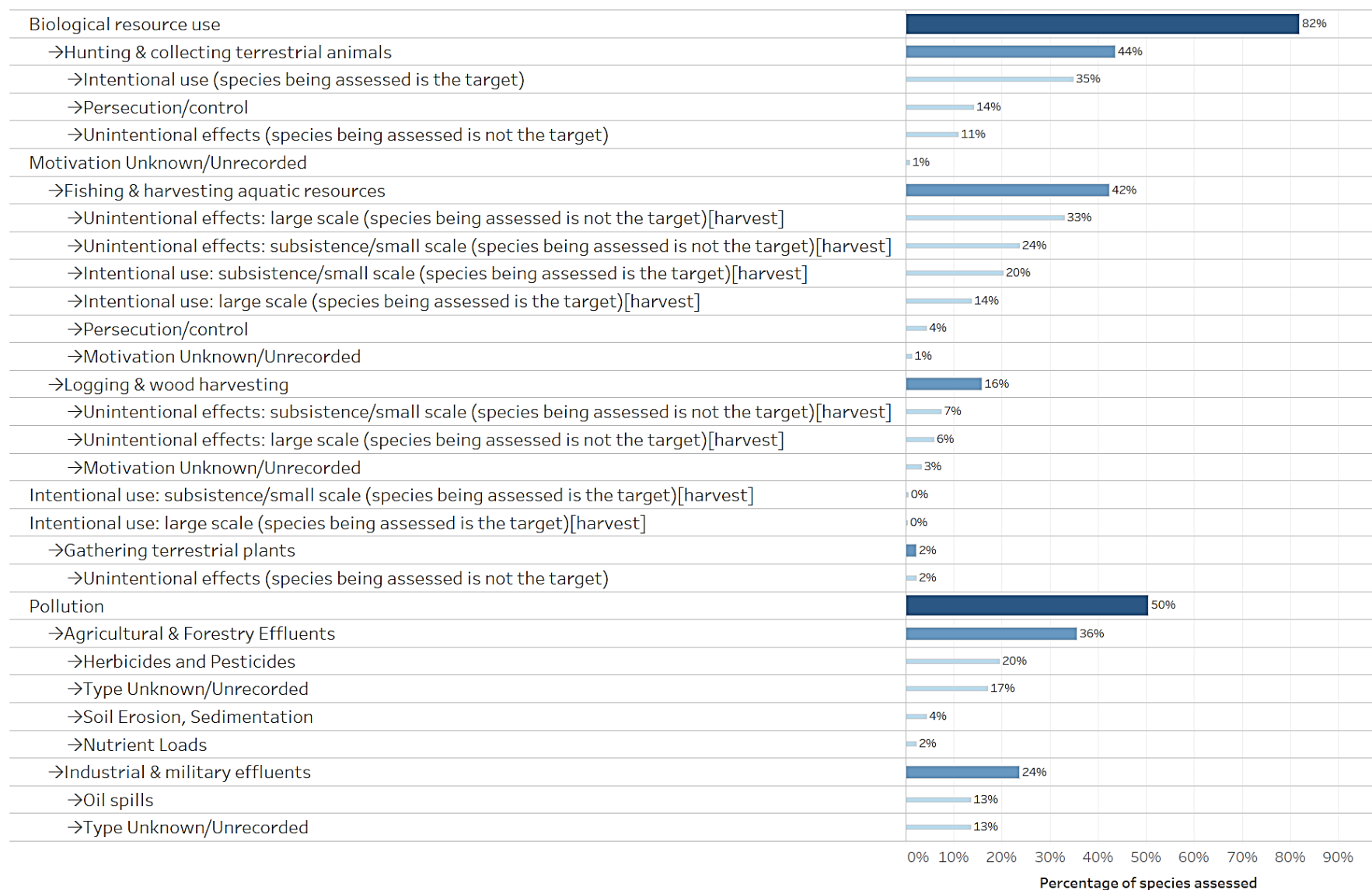
Threats as categorized and defined by the IUCN – CMP Unified Classification of Direct Threats have been extracted from Red List Assessments for Appendix II listed species whenever available³. All three levels defined by the IUCN hierarchical classification scheme have been considered. A total of 425 species had information about threats available. Threat categories have been extracted from the assessments of the global population of listed taxa, they do not consider the level of geographic population as indicated on Appendix II for some species.

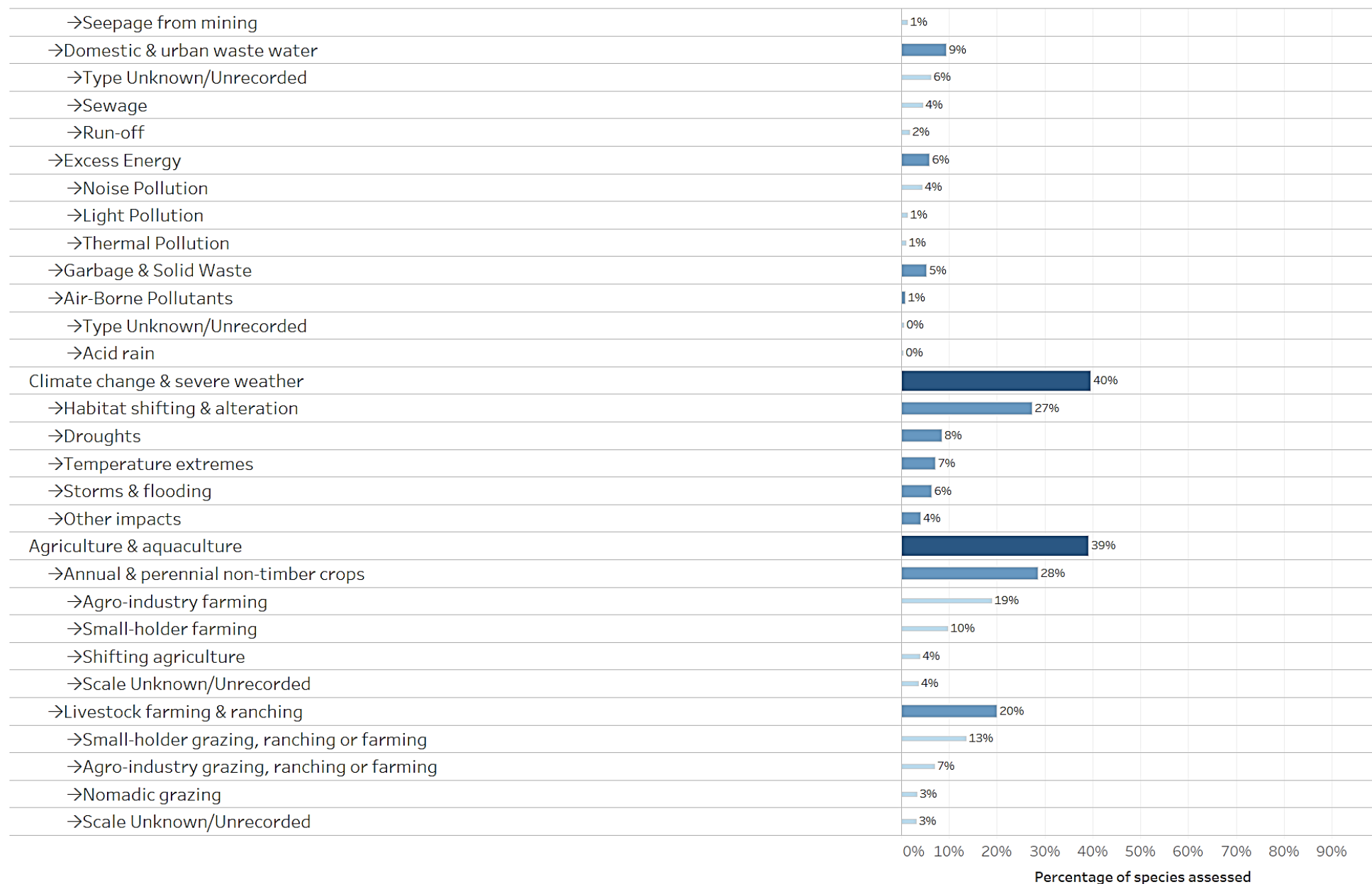
Figure 17 shows the percentage of species impacted by kind of threat. Biological resource use impacts 348 species (82%); pollution is affecting 214 species (50%); climate change 168 (40%); Agriculture & aquaculture 166 species (39%); and the modification of natural systems, which is, the changes to natural processes such as fire, hydrology and sedimentation affects 149 species (35%).

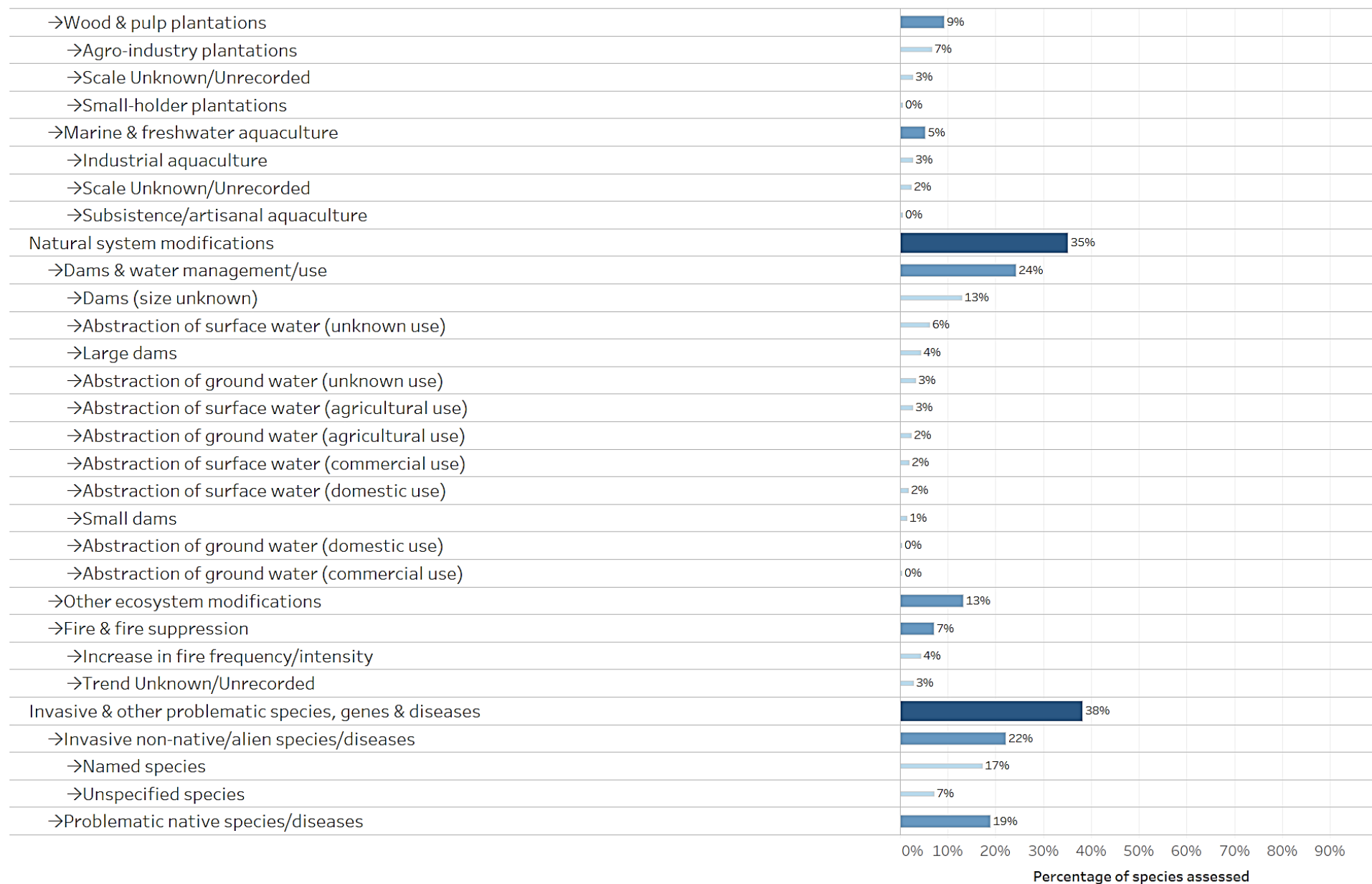
Fig. 18 show the percentage of the main four taxonomic groups, impacted by the main kind of threat. Specific threats by taxonomic group are shown in table 3.

³ According to the *Rules of Procedure for IUCN Red List Assessments 2017–2020*, codification for threats is not a required supporting information for all assessments, it is required only for taxa assessed as Extinct, Extinct in the Wild, Critically Endangered, Endangered, Vulnerable, and Near Threatened.

Fig. 17 Percentage of species listed and covered on Appendix II impacted, by kind of threat







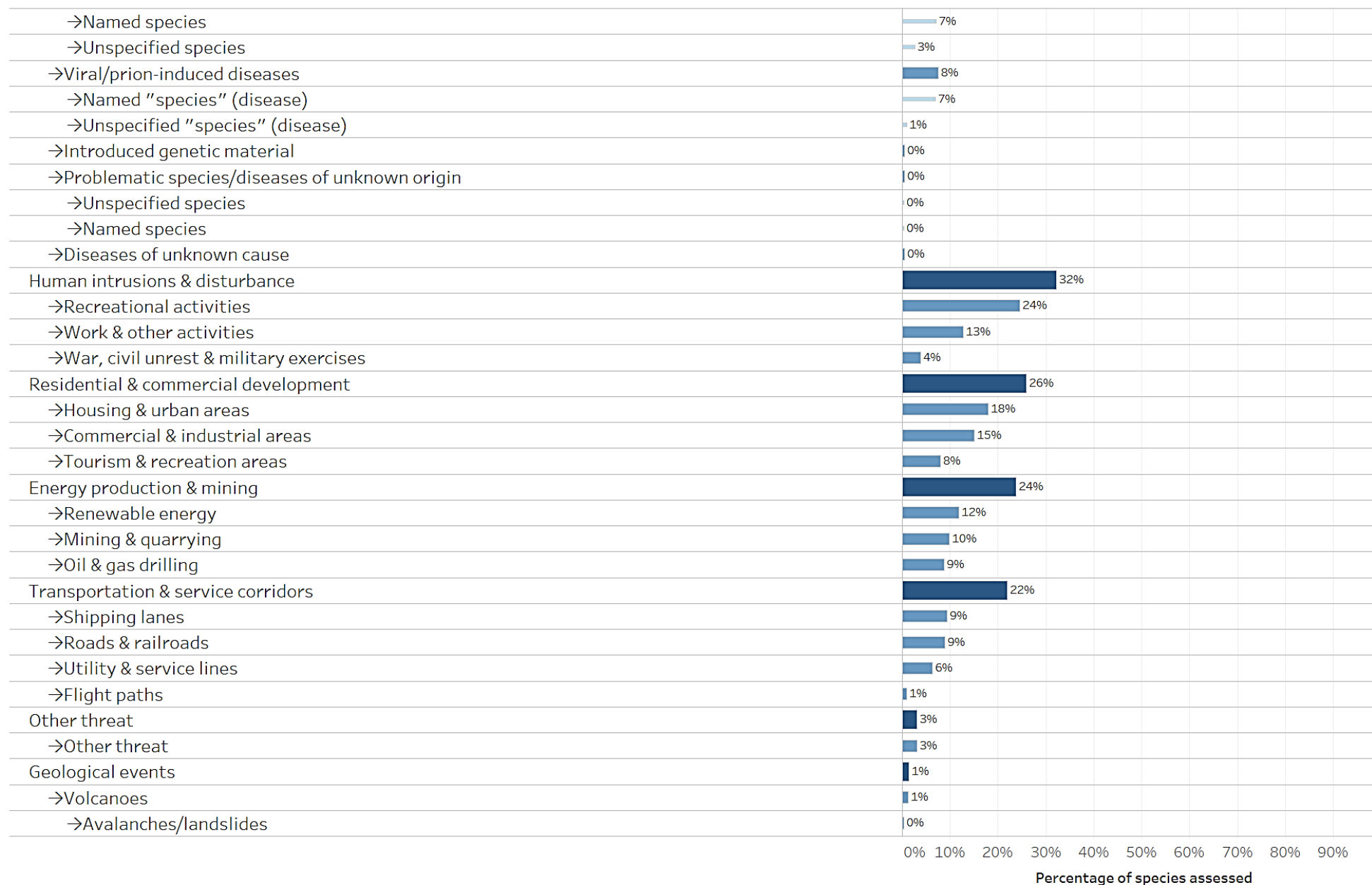
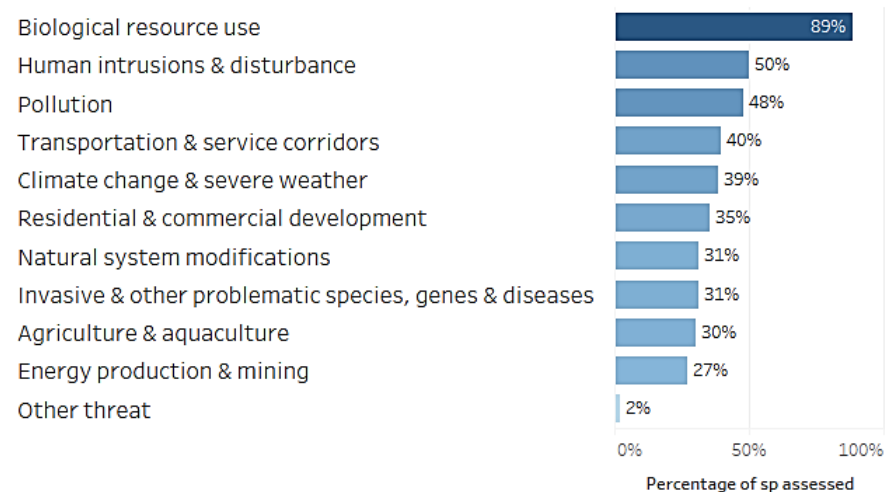
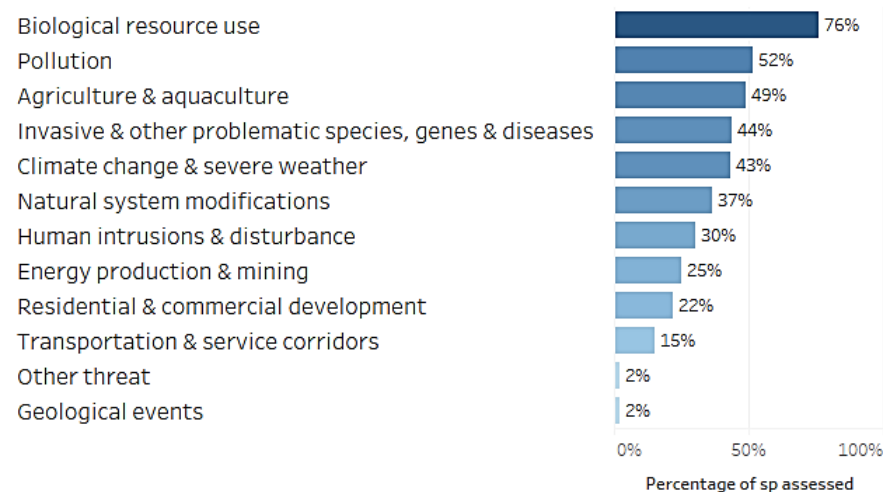


Fig. 18 Percentage of species listed and covered on Appendix II in each taxonomic group impacted, by main kind of threat

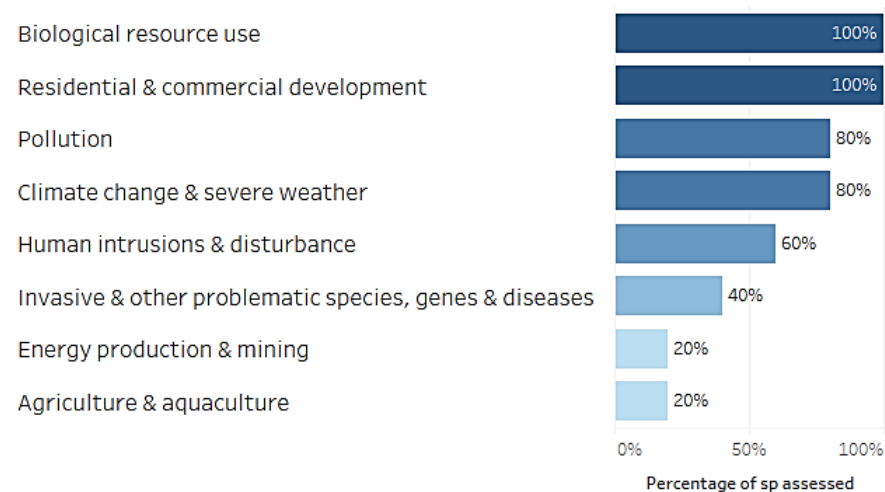
Appendix II/Mammalia listed and covered - Main threats



Appendix II/Aves listed and covered - Main threats



Appendix II/Reptilia listed and covered - Main threats



Appendix II/Pisces listed and covered - Main threats

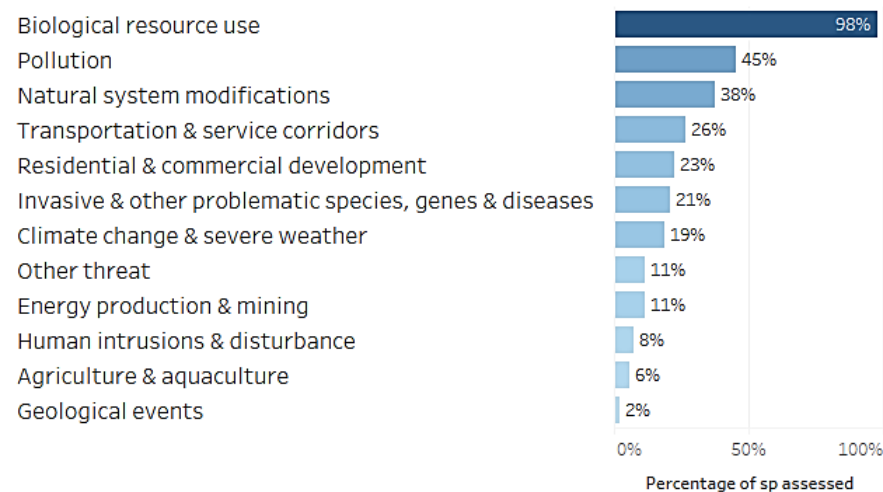


Table 3. Percentage of species listed and covered in each taxonomic group on Appendix II impacted, by kind of threat.

	Group			
	Mammalia	Aves	Reptilia	Pisces
Biological resource use	89%	76%	100%	98%
→Hunting & collecting terrestrial animals	25%	59%	20%	2%
→Intentional use (species being assessed is the target)	22%	46%	20%	
→Persecution/control	9%	19%		
→Unintentional effects (species being assessed is not the target)	7%	14%		
→Motivation Unknown/Unrecorded		1%		2%
→Fishing & harvesting aquatic resources	56%	25%	100%	98%
→Unintentional effects: large scale (species being assessed is not the target)[harvest]	39%	20%	80%	83%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	27%	11%	60%	77%
→Intentional use: subsistence/small scale (species being assessed is the target)[harvest]	42%		80%	79%
→Intentional use: large scale (species being assessed is the target)[harvest]	24%		40%	62%
→Persecution/control	9%			17%
→Motivation Unknown/Unrecorded	4%			2%
→Logging & wood harvesting	16%	18%		6%
→Unintentional effects: subsistence/small scale (species being assessed is not the target)[harvest]	3%	10%		
→Unintentional effects: large scale (species being assessed is not the target)[harvest]	2%	8%		2%
→Motivation Unknown/Unrecorded	11%	1%		2%
→Intentional Use: subsistence/small scale (species being assessed is the target)	2%			
→Intentional Use: large scale (species being assessed is the target)				2%
→Gathering terrestrial plants		3%		
→Unintentional effects (species being assessed is not the target)		3%		
Pollution	48%	52%	80%	45%
→Agricultural & Forestry Effluents	41%	35%		32%
→Herbicides and Pesticides	14%	24%		9%
→Type Unknown/Unrecorded	28%	13%		21%
→Soil Erosion, Sedimentation	3%	2%		17%
→Nutrient Loads	3%	1%		8%
→Industrial & military effluents	33%	18%	40%	32%
→Oil spills	16%	11%	20%	21%
→Type Unknown/Unrecorded	23%	8%	20%	23%

	Group			
	Aves	Mammalia	Pisces	Reptilia
→Seepage from mining		2%	6%	
→Domestic & urban waste water	3%	19%	23%	20%
→Type Unknown/Unrecorded	3%	13%	11%	
→Sewage	0%	7%	19%	20%
→Run-off		3%	8%	
→Excess Energy	1%	18%	8%	40%
→Noise Pollution		18%	2%	
→Light Pollution	1%		2%	40%
→ Thermal Pollution			8%	
→Garbage & Solid Waste	4%	5%	9%	40%
→Air-Borne Pollutants	0%		4%	
→Type Unknown/Unrecorded	0%		2%	
→ Acid rain			2%	
Climate change & severe weather	43%	39%	19%	80%
→Habitat shifting & alteration	30%	27%	11%	40%
→Droughts	8%	13%	6%	
→Temperature extremes	3%	11%	13%	60%
→Storms & flooding	7%	5%	2%	40%
→Other impacts	4%	3%	2%	20%
Agriculture & aquaculture	49%	30%	6%	20%
→Annual & perennial non-timber crops	37%	19%	6%	
→Agro-industry farming	25%	10%	4%	
→Small-holder farming	10%	14%	2%	
→Shifting agriculture	4%	4%		
→Scale Unknown/Unrecorded	4%	2%	2%	
→Livestock farming & ranching	24%	18%	4%	
→Small-holder grazing, ranching or farming	17%	11%		
→Agro-industry grazing, ranching or farming	8%	6%	2%	
→Nomadic grazing	1%	11%		
→Scale Unknown/Unrecorded	4%	2%	2%	

	Group			
	Aves	Mammalia	Pisces	Reptilia
→Wood & pulp plantations	12%	5%	2%	
→Agro-industry plantations	9%	3%	2%	
→Scale Unknown/Unrecorded	3%	2%		
→Small-holder plantations		2%		
→Marine & freshwater aquaculture	6%	5%	2%	20%
→Industrial aquaculture	3%	1%		20%
→Scale Unknown/Unrecorded	2%	3%	2%	
→Subsistence/artisanal aquaculture		1%		20%
Natural system modifications	37%	31%	38%	
→Dams & water management/use	24%	19%	38%	
→Dams (size unknown)	10%	11%	34%	
→Abstraction of surface water (unknown use)	10%			
→Large dams	4%	4%	4%	
→Abstraction of ground water (unknown use)	3%	4%	4%	
→Abstraction of surface water (agricultural use)	2%	3%	4%	
→Abstraction of ground water (agricultural use)	2%		8%	
→Abstraction of surface water (commercial use)	1%	3%	2%	
→Abstraction of surface water (domestic use)	1%	3%	2%	
→Small dams	0%	4%	2%	
→Abstraction of Ground Water (domestic use)			2%	
→ Abstraction of Ground Water (commercial use)			2%	
→Other ecosystem modifications	16%	14%		
→Fire & fire suppression	8%	7%		
→Increase in fire frequency/intensity	6%	2%		
→Trend Unknown/Unrecorded	3%	5%		
Invasive & other problematic species, genes & diseases	44%	31%	21%	40%
→Invasive non-native/alien species/diseases	28%	9%	17%	
→Named species	25%	3%	6%	
→Unspecified species	6%	6%	17%	
→Problematic native species/diseases	18%	26%	11%	20%

	Group			
	Aves	Mammalia	Pisces	Reptilia
→Named species	11%		2%	
→Unspecified species	3%	3%		
→Viral/prion-induced diseases	11%	2%		20%
→Named "species" (disease)	10%	1%		20%
→Unspecified "species" (disease)	1%	2%		
→Introduced genetic material		1%	2%	
→Problematic Species/Diseases of Unknown Origin	1%			
→Unspecified Species	0%			
→Named Species	0%			
→Diseases of unknown cause		2%		
Human intrusions & disturbance	30%	50%	8%	60%
→Recreational activities	23%	38%	8%	60%
→Work & other activities	12%	20%		40%
→War, civil unrest & military exercises	1%	13%		
Residential & commercial development	22%	35%	23%	100%
→Housing & urban areas	15%	26%	13%	40%
→Commercial & industrial areas	10%	23%	21%	60%
→Tourism & recreation areas	5%	11%	8%	100%
Energy production & mining	25%	27%	11%	20%
→Renewable energy	17%	3%	2%	
→Mining & quarrying	9%	15%	8%	
→Oil & gas drilling	6%	18%	6%	20%
Transportation & service corridors	15%	40%	26%	
→Shipping lanes	1%	26%	23%	
→Roads & railroads	8%	14%	4%	
→Utility & service lines	9%	1%	2%	
→Flight paths	1%			
Other threat	2%	2%	11%	
→Other threat	2%	2%	11%	
Geological events	2%		2%	
→Volcanoes	1%		2%	
→Avalanches/Landslides	0%			