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STATUS AND TRENDS OF ANIMAL GENETIC RESOURCES - 2014¹

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¹ Based on data reported by National Coordinators for the Management of Animal Genetic Resources to DAD-IS by June 2014.

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United Nations Cartographic Section, Department of Field Support.

<http://www.un.org/Depts/Cartographic/english/htmain.htm>

I. Introduction

In line with the request of the Twelfth Regular Session of the Commission on Genetic Resources for Food and Agriculture, this report follows the structure set out in the document *Format and content of future status and trends reports on animal genetic resources*,² taking into account the amendments requested by the Commission at its Fourteenth Regular Session. The analysis is based on FAO's Global Databank for Animal Genetic Resources, backbone of the Domestic Animal Diversity Information System (DAD-IS). It updates the data published in the report *Status and trends of animal genetic resources – 2012*.³

Prior to the analysis, all National Coordinators for the Management of Animal Genetic Resources were asked to update their national data as fully as possible by a set deadline and were reminded of the need to enter data related to the new locally adapted versus exotic breed classification set out in the document Report of a consultation on the definition of breed categories⁴ and that they also have the option of indicating that a given locally adapted breed is native to the respective country.

The present report begins by describing the state of reporting on animal genetic resources, and the progress made in this respect during the reporting period. A description of the current regional distribution of livestock species and breeds is then presented, followed by an overview of the risk status of the world's livestock breeds and trends in risk status over the reporting period. In line with the Commission's request, a cut-off point of ten years has been introduced into the calculation of trends in risk status and diversity: Any breed for which no population data have been reported for ten years is now considered to be of unknown risk status. Trends were calculated on the basis of the most up-to-date current and historical data available in DAD-IS as of 18 June 2014. The report presents the set of resource indicators set out in the document *Targets and indicators for animal genetic resources*⁵ and agreed upon by the Commission at its Fourteenth Regular Session. The annexes to the report provide a detailed breakdown of the state of reporting, by country and by region.

II. State of reporting

The Global Databank for Animal Genetic Resources currently contains data from 182 countries and 38 species. The total number of national breed populations recorded in the Global Databank has increased during the reporting period (Table 1). The total number of mammalian national breed populations recorded in June 2014 was 11 062, as compared 10 712 in June 2012. The total number of avian national breed populations recorded in 2014 was 3 807, as compared to 3 482 in 2012.

Since 2012, the percentage of avian national breed populations for which any population data (including also those where no updates have been provided during the last ten years) are available has increased from 48 percent to 56 percent, while in the case of mammals there has been an improvement from 57 percent to 60 percent not applying the ten year cut-off point as described above (Table 1). Twenty-seven countries updated their national data in 2013 and 53 in 2014. However, for 78 percent of national breed populations, no data on population size have been reported for any of the last four years (2011, 2012, 2013 and 2014). Figure 1 provides a regional breakdown of the reporting figures.

The number of breed populations recorded by countries in the European and the Caucasus region has increased by 265 for avian breeds and 315 for mammalian breeds compared to 2012. Despite this large increase in the number of breed populations reported, the percentage of breed populations for which population figures have been reported stayed the same as in 2012 (84 percent) for mammalian breed populations and increased for avian breed populations from 65 percent in 2012 to 77 percent in 2014. However, updating activities differ significantly between countries and regions. Figure 2 provides insight into the global updating activities of population size data since March 2007, revealing big gaps in many regions of the world.

In line with the Commission's request, DAD-IS has been further developed so as to allow the entry of data indicating whether breed populations are locally adapted or exotic to the respective country. National Coordinators were invited to enter these data for all their national breed populations. By June 2014, 12 504 national breed populations remained unclassified by National Coordinators. Because

² CGRFA/WG-AnGR-5/09/3.2

(http://www.fao.org/ag/againfo/programmes/en/genetics/documents/ITWG_AnGR_5_09_3_2.pdf).

³ CGRFA-13/11/Inf.17 (<http://www.fao.org/docrep/meeting/022/am649e.pdf>).

⁴ CGRFA/WG-AnGR-7/12/Inf.7

⁵ CGRFA/WG-AnGR-7/12/7

such a large number of unclassified breed populations would have precluded any interpretation of indicators that involve the use of the new breed classification, the empty breed classification fields were provisionally filled for the purpose of calculating and testing these indicators. Based on the assumption that local and regional transboundary breeds are more likely to be locally adapted than international transboundary breeds, unclassified breeds belonging to the first two distributional categories were assigned to the locally adapted category and international transboundary breeds assigned to the exotic category. Due to the lack of data regarding the adaptedness class of breeds provided by National coordinators, figures and tables based on this classification system can only be considered as examples for presenting such type of data in future reports.

Table 1. Status of information recorded in the Global Databank for Animal Genetic Resources

Year of analysis	Mammalian species		Avian species		Countries covered
	Number of national breed populations	% with population data	Number of national breed populations	% with population data	
1993	2719	53	-	-	131
1995	3019	73	863	85	172
1999	5330	63	1049	77	172
2006	10512	43	3505	39	181
2008	10550	52	3450	47	181
2010	10507	54	3414	47	182
2012	10712	57	3482	48	182
2014	11062	60	3807	56	182

No data recorded for Andorra, Brunei Darussalam, Liechtenstein, Marshall Islands, Micronesia (Federated States of), Monaco, Nauru, Qatar, San Marino, Singapore, South Sudan, Timor-Leste, United Arab Emirates, Western Sahara.

Figure 1. Proportion of national breed populations for which population figures have been reported

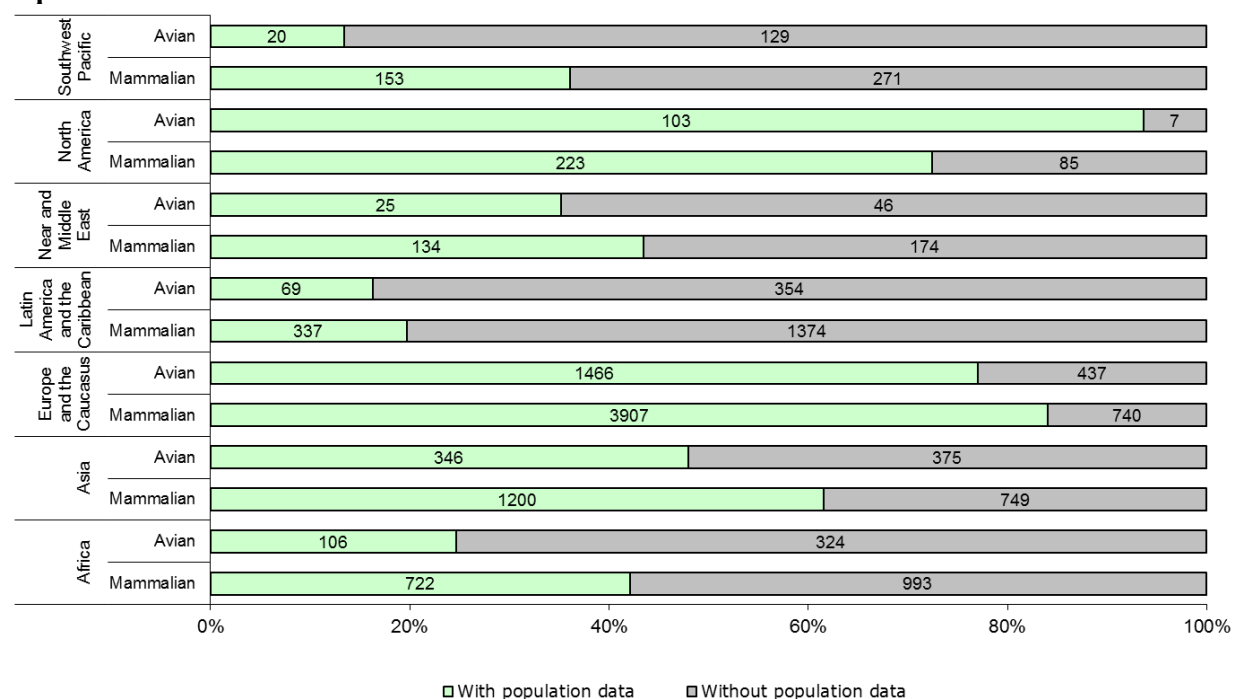


Figure 3. Number of local/transboundary and locally adapted / exotic breeds at global level

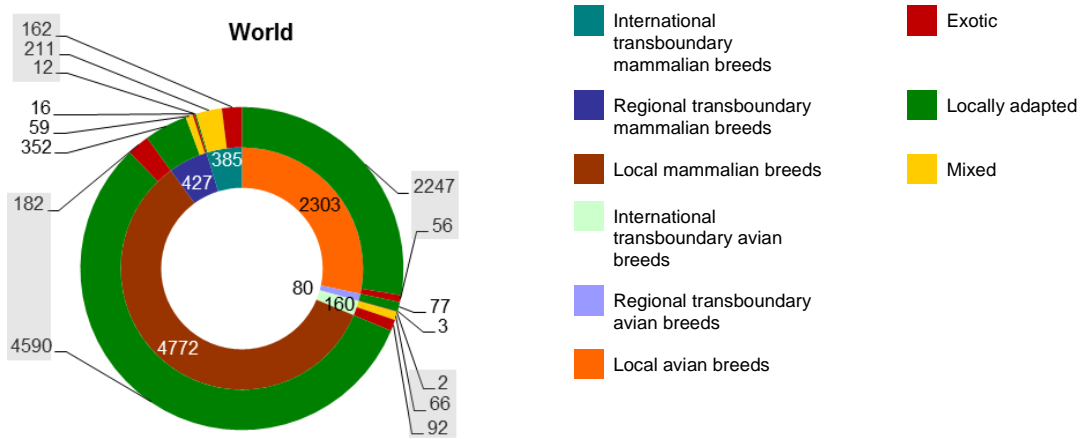
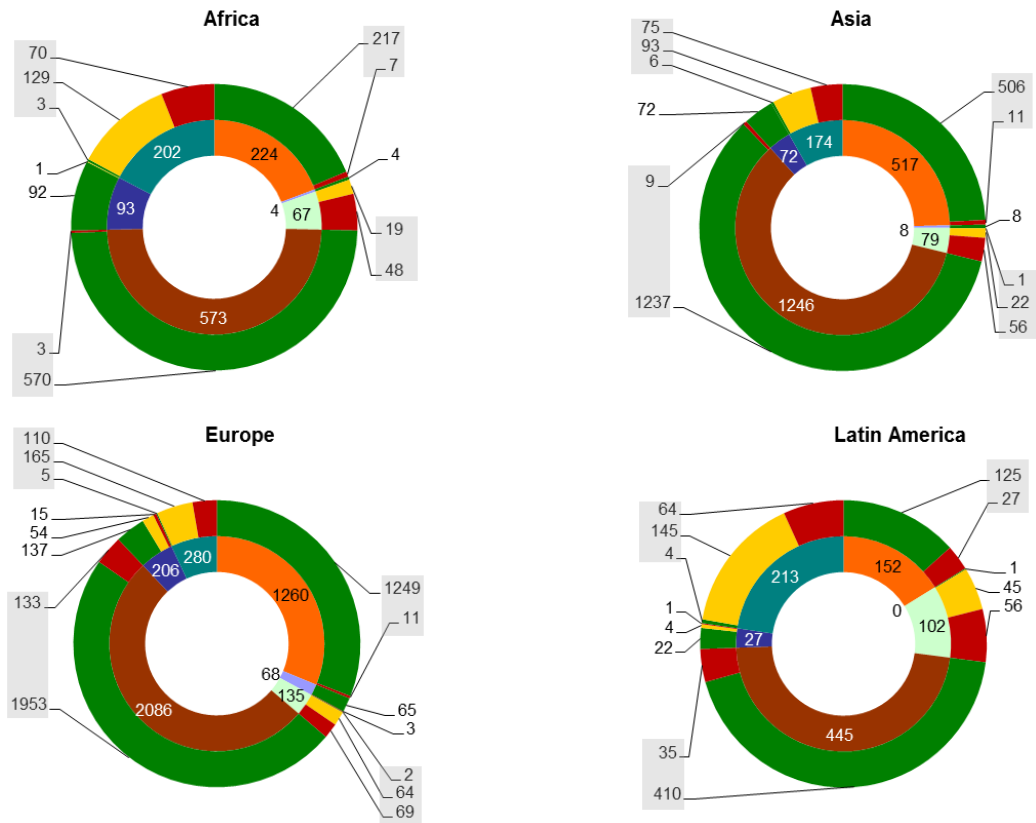
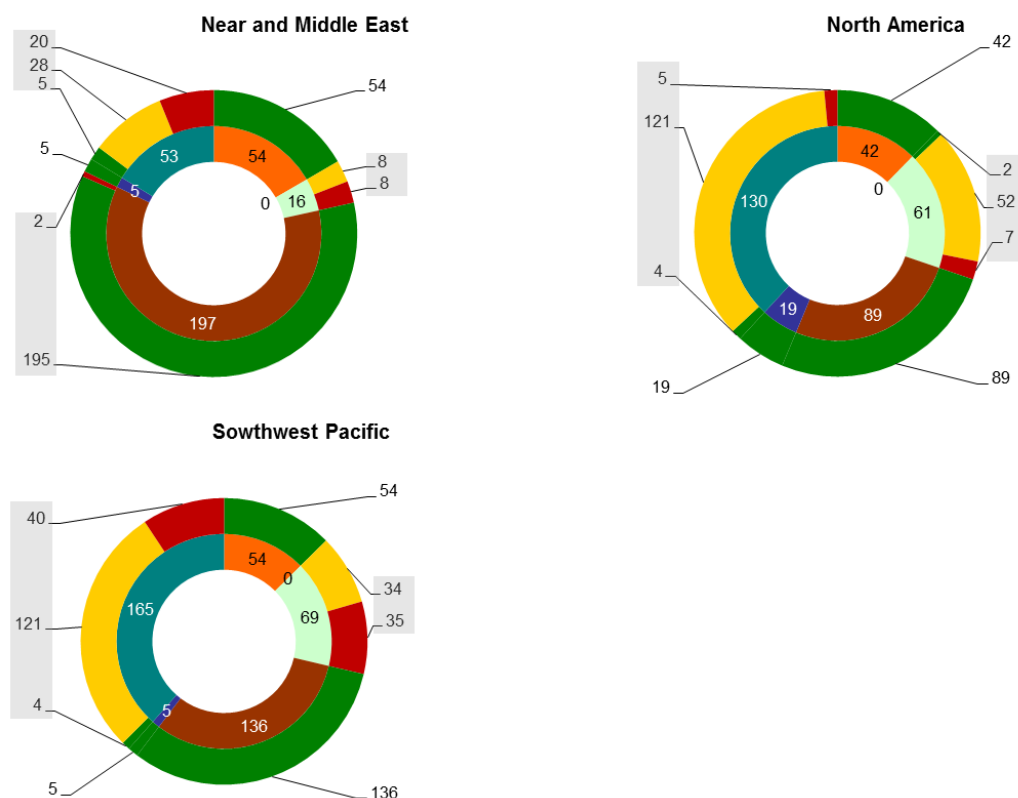


Figure 4. Number of local /transboundary and locally adapted/ exotic breeds at regional level





Note that international transboundary breeds are counted in each region where they occur. Therefore, for this category of breeds, the global total is not the sum of the regional totals.

Tables 2a and 3a, respectively, show the number of reported local breeds of mammalian and avian species for each region of the world. For most livestock species, Europe and the Caucasus or Asia has the highest number of local breeds. The dromedary, with most local breeds located in Africa and the Near and Middle East, and the guinea pig, with most local breeds located in Latin America and the Caribbean, are exceptions to this pattern. The totals in some categories have fallen, because countries have corrected their inventories. Tables 2b and 3b, respectively, show, for each region of the world, the number of reported local breeds of mammalian and avian species that are classified as locally adapted. The figures in tables 2a and 3a differ only slightly from those in 2b and 3b, respectively. As described above, local breeds that, at the time the analysis was undertaken, had not been categorized by National Coordinators were all provisionally assigned to the locally adapted category.

Table 2a. Mammalian species – number of reported local breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	20	39	50	24	16	5	3	157
Bactrian camel	0	9	3	0	0	0	0	12
Buffalo	2	90	9	11	8	1	2	123
Cattle	176	241	369	141	43	17	32	1019
Dromedary	46	13	1	0	23	0	2	85
Goat	96	183	218	28	34	6	11	576
Guinea pig	4	0	0	13	0	0	0	17
Horse	40	138	371	84	14	22	25	694
Pig	53	214	188	60	1	12	15	543
Rabbit	11	16	186	18	5	0	0	236
Sheep	117	262	613	51	53	21	38	1155
Yak	0	25	2	0	0	1	0	28
Others	8	16	76	15	0	4	8	127
Total	573	1246	2086	445	197	89	136	4772

Note : Figures exclude extinct breeds. Figures for Alpaca, American bison, deer, dog, dromedary × Bactrian camel, guanaco, llama and vicuña are combined in the “others” category

Table 2b. Mammalian species – number of reported local breeds categorized as locally adapted

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	20	39	50	23	16	5	3	156
Bactrian camel	0	9	3	0	0	0	0	12
Buffalo	2	89	8	11	8	1	2	121
Cattle	175	239	327	131	43	17	32	964
Dromedary	46	13	1	0	23	0	2	85
Goat	95	180	209	28	33	6	11	562
Guinea pig	4	0	0	13	0	0	0	17
Horse	40	137	332	77	14	22	25	647
Pig	52	214	179	59	1	12	15	532
Rabbit	11	16	184	10	5	0	0	226
Sheep	117	260	583	43	52	21	38	1114
Yak	0	25	1	0	0	1	0	27
Others	8	16	76	15	0	4	8	127
Total	570	1237	1953	410	195	89	136	4590

Note: Figures exclude extinct breeds. Figures for Alpaca, American bison, deer, dog, dromedary × Bactrian camel, guanaco, llama and vicuña are combined in the “others” category

Table 3a. Avian species – number of reported local breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	129	305	912	88	35	15	30	1514
Duck	15	92	107	22	4	1	12	253
Goose	10	44	119	5	2	0	2	182
Muscovy duck	5	9	6	1	1	0	2	24
Ostrich	6	2	3	0	0	0	1	12
Partridge	2	8	2	0	0	0	0	12
Pheasant	0	7	5	6	0	0	0	18
Pigeon	7	12	35	7	8	1	2	72
Turkey	11	11	40	11	3	11	5	92
Others	39	27	31	12	1	14	0	124
Total	224	517	1260	152	54	42	54	2303

Note: Figures exclude extinct breeds. Figures for cassowary, Chilean tinamou, duck × Muscovy duck, emu, guinea fowl, ñandu, peacock, quail and swallow are combined in the “others” category.

Table 3b. Avian species – number of reported local breeds categorized as locally adapted

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	123	295	902	77	35	15	30	1477
Duck	15	91	107	19	4	1	12	249
Goose	10	44	119	5	2	0	2	182
Muscovy duck	5	9	6	1	1	0	2	24
Ostrich	6	2	3	0	0	0	1	12
Partridge	2	8	2	0	0	0	0	12
Pheasant	0	7	5	1	0	0	0	13
Pigeon	7	12	35	2	8	1	2	67
Turkey	11	11	39	9	3	11	5	89
Others	38	27	31	11	1	14	0	122
Total	217	506	1249	125	54	42	54	2247

Note: Figures exclude extinct breeds. Figures for cassowary, Chilean tinamou, duck × Muscovy duck, emu, guinea fowl, ñandu, peacock, quail and swallow are combined in the “others” category.

Tables 4a and 5a, respectively, show the number of reported regional transboundary breeds of mammalian and avian species in each region of the world. For several mammalian species, including sheep, horses and pigs, Europe and the Caucasus, has the highest number of regional transboundary breeds. Africa has a relatively large share of regional transboundary breeds in most of these species. Africa has more regional transboundary breeds of cattle and goats than any other region. Europe and the Caucasus, however, has by far the highest number of regional transboundary breeds among avian species.

The existence of significant numbers of regional transboundary breeds has implications for management and conservation of animal genetic resources, and highlights the need for cooperation at regional or subregional levels.

Tables 4b to 4d and 5b to 5d, respectively, show the number of reported regional transboundary breeds of mammalian and avian species in each region of the world that are classified as locally adapted, mixed and exotic. At this stage, because most national breed populations have not been categorized by their respective National Coordinators, the figures mainly reflect the assumption that regional transboundary breeds can be considered to be locally adapted.

Table 4a. Mammalian species – number of reported regional transboundary breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	3	3	1	1	0	0	0	8
Buffalo	0	9	1	1	0	0	0	11
Cattle	36	20	30	6	1	2	1	96
Deer	0	1	1	0	0	0	0	2
Dromedary	1	1	0	0	0	0	0	2
Goat	16	12	14	2	0	5	1	50
Guinea pig	0	0	0	1	0	0	0	1
Horse	7	10	36	4	0	4	0	61
Pig	3	2	17	5	0	2	0	29
Rabbit	3	0	32	1	0	0	0	36
Sheep	24	14	74	3	4	6	3	128
South American camelids	0	0	0	3	0	0	0	3
Total	93	72	206	27	5	19	5	427

Note: Figures exclude extinct breeds.

Table 4b. Mammalian species – number of reported regional transboundary breeds categorized as locally adapted

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	3	3	0	1	0	0	0	7
Buffalo	0	9	1	1	0	0	0	11
Cattle	35	20	19	4	1	2	1	82
Deer	0	1	1	0	0	0	0	2
Dromedary	1	1	0	0	0	0	0	2
Goat	16	12	13	2	0	5	1	49
Guinea pig	0	0	0	1	0	0	0	1
Horse	7	10	26	4	0	4	0	51
Pig	3	2	16	4	0	2	0	27
Rabbit	3	0	16	0	0	0	0	19
Sheep	24	14	45	2	4	6	3	98
South American camelids	0	0	0	3	0	0	0	3
Total	92	72	137	22	5	19	5	352

Note: Figures exclude extinct breeds.

Table 4c. Mammalian species – number of reported regional transboundary breeds categorized as mixed

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Ass	0	0	1	0	0	0	0	1
Cattle	1	0	7	2	0	0	0	10
Goat	0	0	1	0	0	0	0	1
Horse	0	0	8	0	0	0	0	8
Rabbit	0	0	13	1	0	0	0	14
Sheep	0	0	24	1	0	0	0	25
Total	1	0	54	4	0	0	0	59

Note: Figures exclude extinct breeds.

Table 4d. Mammalian species – number of reported regional transboundary breeds categorized as exotic

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Cattle	0	0	4	0	0	0	0	4
Horse	0	0	2	0	0	0	0	2
Pig	0	0	1	1	0	0	0	2
Rabbit	0	0	3	0	0	0	0	3
Sheep	0	0	5	0	0	0	0	5
Total	0	0	15	1	0	0	0	16

Note: Figures exclude extinct breeds.

Table 5a. Avian species – number of reported regional transboundary breeds

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	4	3	42	0	0	0	0	49
Duck	0	2	12	0	0	0	0	14
Goose	0	2	7	0	0	0	0	9
Quail	0	1	0	0	0	0	0	1
Turkey	0	0	7	0	0	0	0	7
Total	4	8	68	0	0	0	0	80

Note: Figures exclude extinct breeds.

Table 5b. Avian species – number of reported regional transboundary breeds categorized as locally adapted

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	4	3	42	0	0	0	0	49
Duck	0	2	12	0	0	0	0	14
Goose	0	2	7	0	0	0	0	9
Quail	0	1	0	0	0	0	0	1
Turkey	0	0	4	0	0	0	0	4
Total	4	8	65	0	0	0	0	77

Note: Figures exclude extinct breeds.

Table 5c. Avian species – number of reported regional transboundary breeds categorized as mixed

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Turkey	0	0	3	0	0	0	0	3
Total	0	0	3	0	0	0	0	3

Tables 6 and 7, respectively, show the numbers of reported international transboundary mammalian and avian breeds falling within each of the adaptedness categories. Cattle, sheep, horses and chickens are the species that have the highest numbers of international transboundary breeds. Around two-thirds of international transboundary horse and cattle breeds fall within the “mixed” category. Different national breed populations within these breeds have been allocated to different categories by the respective National Coordinators. In the case of sheep, the percentage of breeds falling within the “mixed” category is also quite high, at 58 percent.

Table 6. Mammalian species – number of reported international transboundary breeds by adaptedness classification

Species	Locally adapted	Mixed	Exotic	Total
Alpaca	0	2	0	2
Ass	1	0	4	5
Bactrian camel	0	0	2	2
Buffalo	0	1	3	4
Cattle	3	71	35	109
Deer	2	1	7	10
Dromedary	0	1	1	2
Goat	2	14	20	36
Horse	1	42	20	63
Pig	2	14	14	30
Rabbit	0	8	15	23
Sheep	1	57	41	99
Total	12	211	162	385

Note: Figures exclude extinct breeds.

Table 7. Avian species – number of reported international transboundary breeds by breed classification

Species	Locally adapted	Mixed	Exotic	Total
Cassowary	0	0	1	1
Chicken	2	51	53	106
Duck (domestic)	0	2	10	12
Emu	0	0	1	1
Goose (domestic)	0	1	13	14
Guinea fowl	0	0	5	5
Muscovy duck	0	1	0	1
Ostrich	0	0	3	3
Pigeon	0	0	1	1
Turkey	0	11	5	16
Total	2	66	92	160

Note: Figures exclude extinct breeds.

IV. Risk status of animal genetic resources

As noted above, since the last status and trends report was prepared, the method for assigning breeds to risk-status categories has been amended by the introduction of a cut-off point of ten years, beyond which the risk status of a breed is considered to be unknown if no updated population data have been reported. The results presented in this section are therefore not directly comparable to those presented in the Status and trends of animal genetic resources – 2012⁶. Trends based on figures that are comparable over time are presented in Section V of this report.

A total of 1 458 breeds (17 percent of all breeds including those that are extinct) are classified as being at risk. The percentage of breeds classified as being of unknown risk status has increased from 34 percent in 2012 to 58 percent in 2014, mainly because of the above-mentioned new calculation method. The figures present a more realistic picture of the state of data availability than the equivalent figures did in past reports.

The inner ring of the left hand side of Figure 5 shows that, for mammalian species, the proportion of breeds classified as at risk is lower overall (16 percent) than for avian species (17 percent). However, in absolute terms, the number of breeds at risk is higher for mammalian species (955 breeds) than for avian species (503 breeds). Comparing the right and left-hand side of Figure 5 shows that the vast majority of breeds at risk and almost all extinct breeds are classified as locally adapted breeds.

Figure 6a presents risk-status data for mammalian species. It can be seen that horse, sheep and cattle are the mammalian species with the highest number of breeds at risk. However, rabbits (45 percent) followed by horses (22 percent) and asses (17 percent) are the species that have the highest proportions of breeds at risk. Figure 6a also shows the large number of breeds for which no risk-status data are available. The problem is particularly significant in some species – 93 percent for deer breeds, 66 percent for ass breeds and 98 percent for dromedary breeds. This lack of data is a serious constraint to effective prioritization and planning of breed conservation measures. Cattle are the species with the highest number of breeds (184) reported as extinct. Large numbers of extinct breeds of sheep (160), pig (107) and horse (87) are also reported. It should be noted that some breeds may have become extinct before they were documented. Any such breeds will, clearly, be missing from this analysis. Figures 6b and 6c present risk-status data for mammalian species, broken down by adaptedness category (locally adapted and mixed) to provide an example on how such complex data can be illustrated in future.

Among avian species, chickens have by far the highest number of breeds at risk on a world scale (Figure 7a). As in the case of mammalian species, there are a large number of breeds for which population figures are unavailable. Extinct breeds have mainly been reported among chickens. There are also a few cases among ducks, guinea fowl and turkeys.

Figures 6b and 6c present risk-status data for mammalian species, broken down by adaptedness category (locally adapted and mixed). Figures 7b and 7c present the equivalent figures for avian species. Figures 8a and 9a show the distribution of breeds at risk by region for mammalian and avian species. Figures 8b, 8c, 9b and 9c, split the regional presentations into the locally adapted and mixed categories.

The regions with the highest proportion of their breeds classified as at risk are Europe and the Caucasus (31 percent of mammalian breeds and 35 percent of avian breeds) and North America (16 percent of mammalian breeds). These are the regions that have the most highly specialized livestock industries, in which production is dominated by a small number of breeds. In absolute terms, the Europe and the Caucasus region has by far the highest number of at-risk breeds. Despite the apparent dominance of these two regions, problems in other regions may be obscured by the large number of breeds with unknown risk status. The new method for calculating risk status (based on the ten-year cut off point) draws attention to the fact that during the ten years up to June 2014 countries from Latin America and the Caribbean, the Near and Middle East, North America or the Southwest Pacific reported almost no population data for any avian breeds. Almost all (except one breed in Latin America and the Caribbean) of the avian breeds from these regions are therefore classified as being of unknown risk status. Likewise, for more than 90 percent of Africa's breeds and more than 80 percent of Asia's breeds, the lack of recent population data means that no risk status could be assigned. Figure 5. Number of the world's breeds in different breed classes and risk-status category

⁶ CGRFA-13/11/Inf.17 (<http://www.fao.org/docrep/meeting/022/am649e.pdf>).

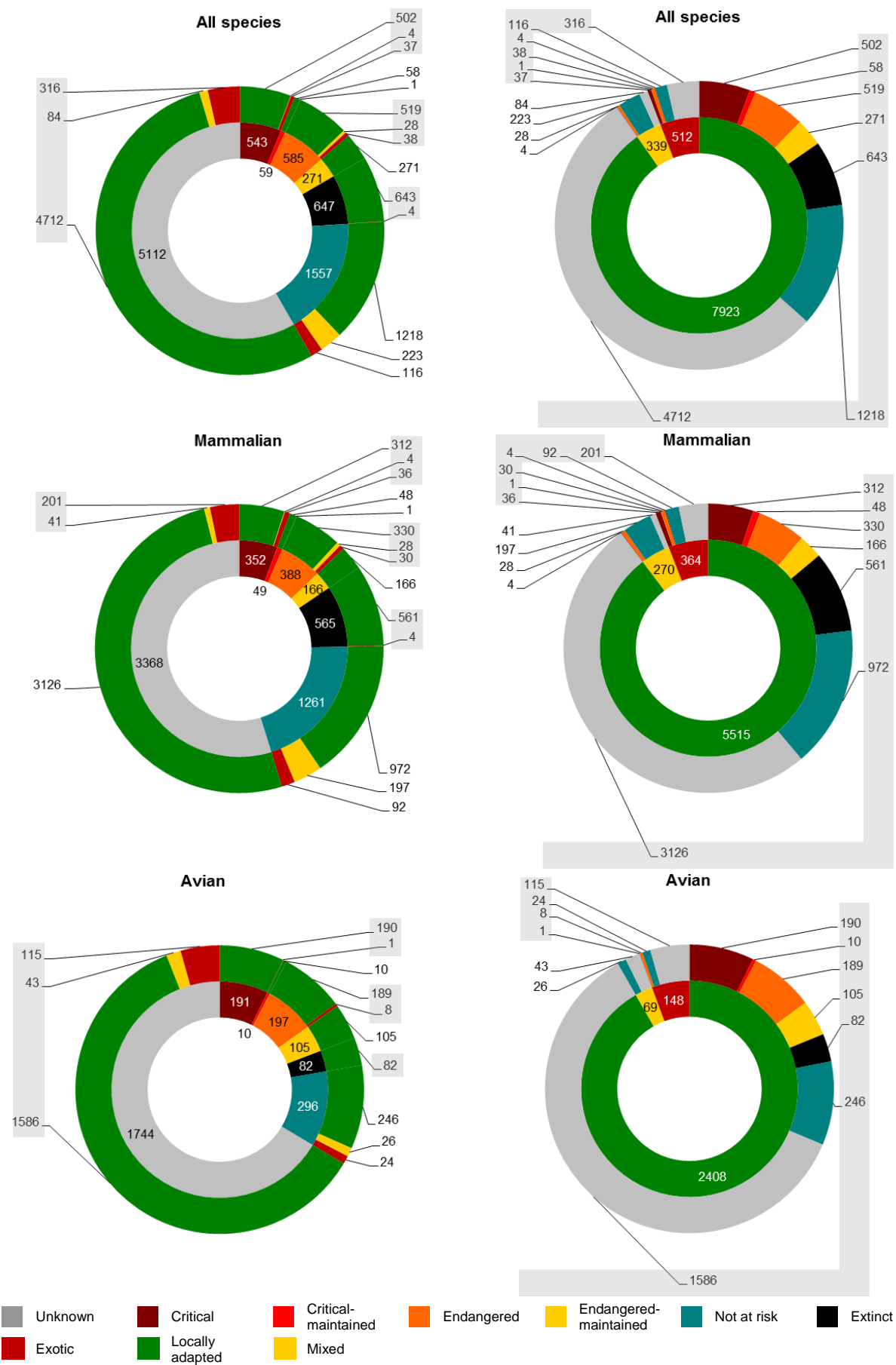
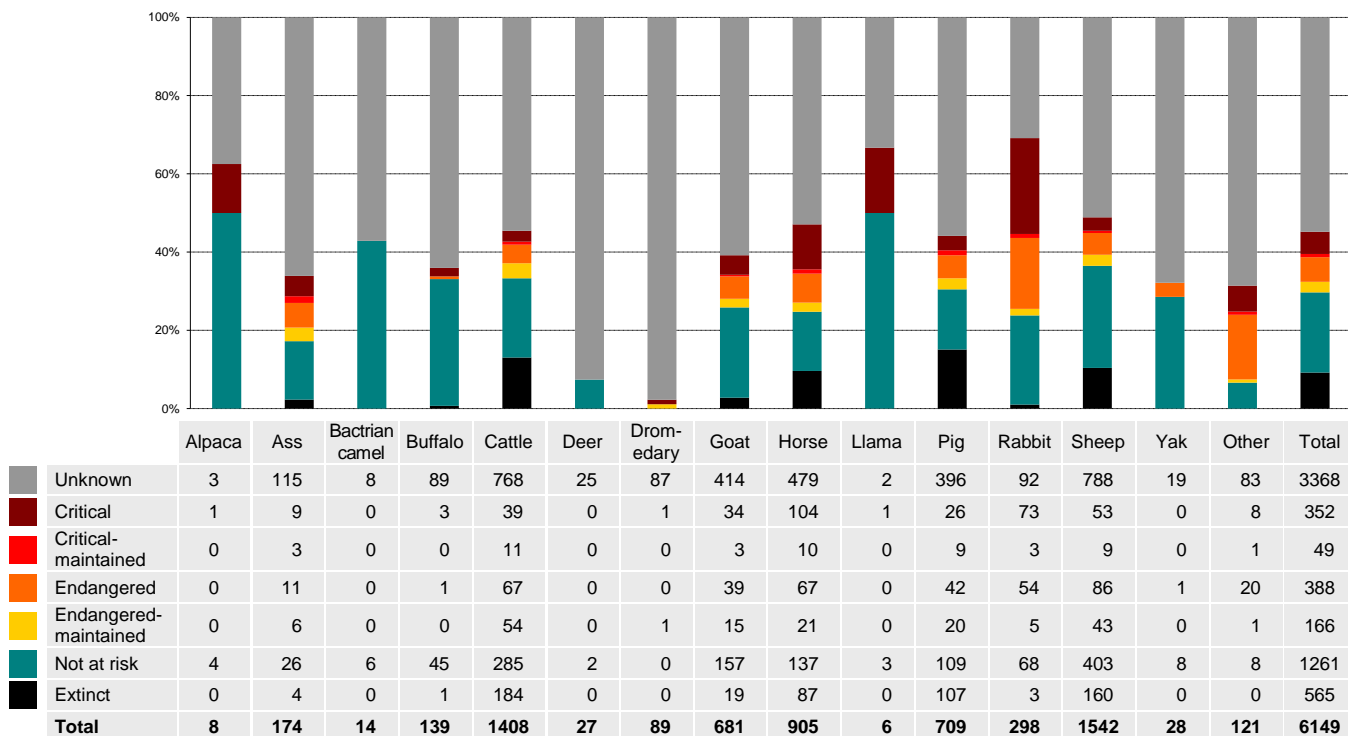
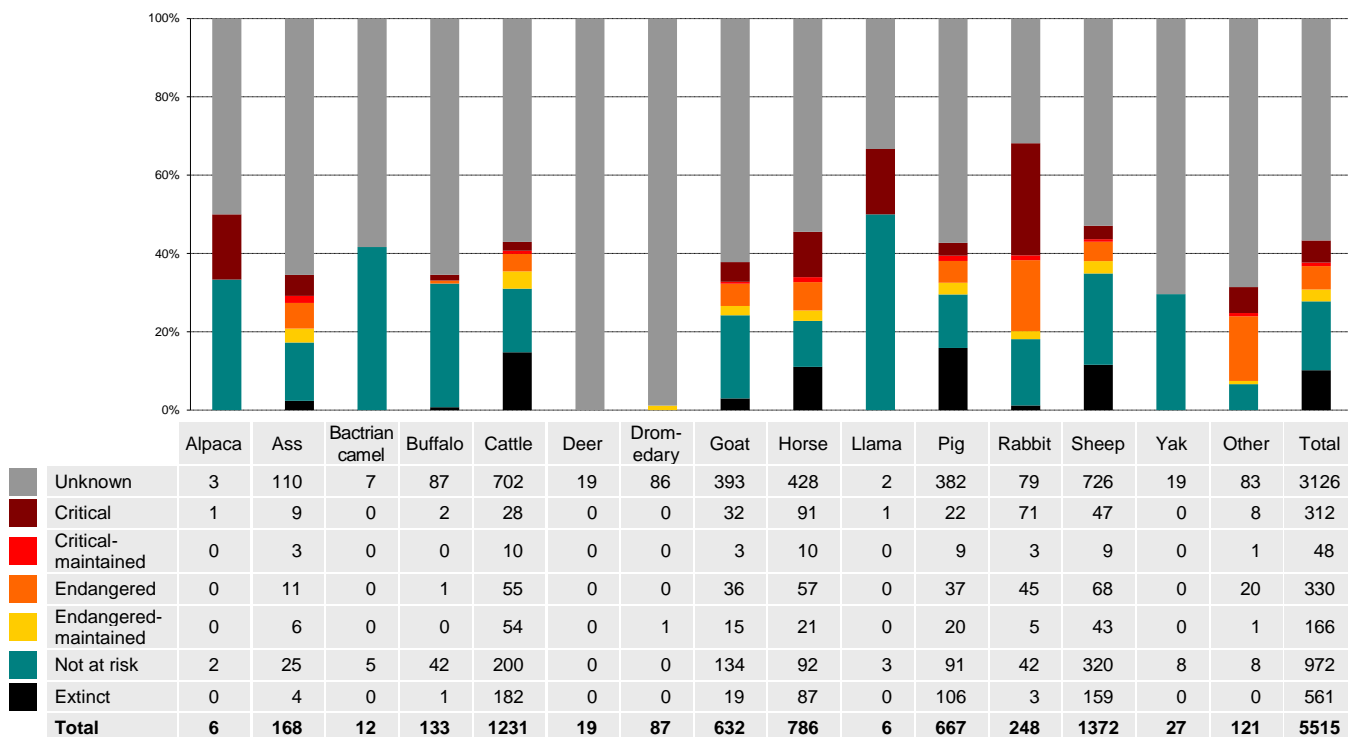


Figure 6a. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by species



* Other: Bactrian camel × dromedary crosses, guanacos, vicuñas, guinea pigs and dogs.

Figure 6b. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by species – locally adapted category



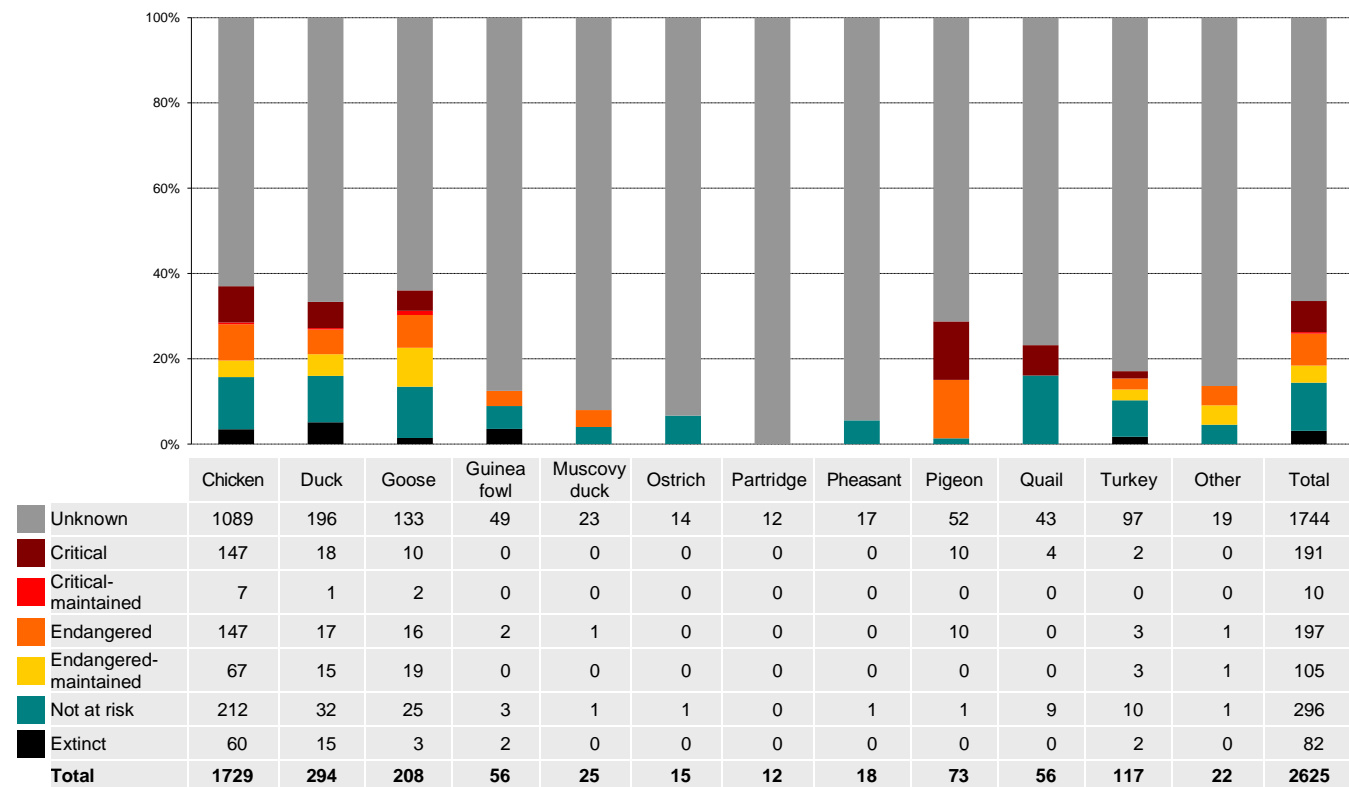
* Other: Bactrian camel × dromedary crosses, guanacos, vicuñas, guinea pigs and dogs.

Figure 6c. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by species – mixed category



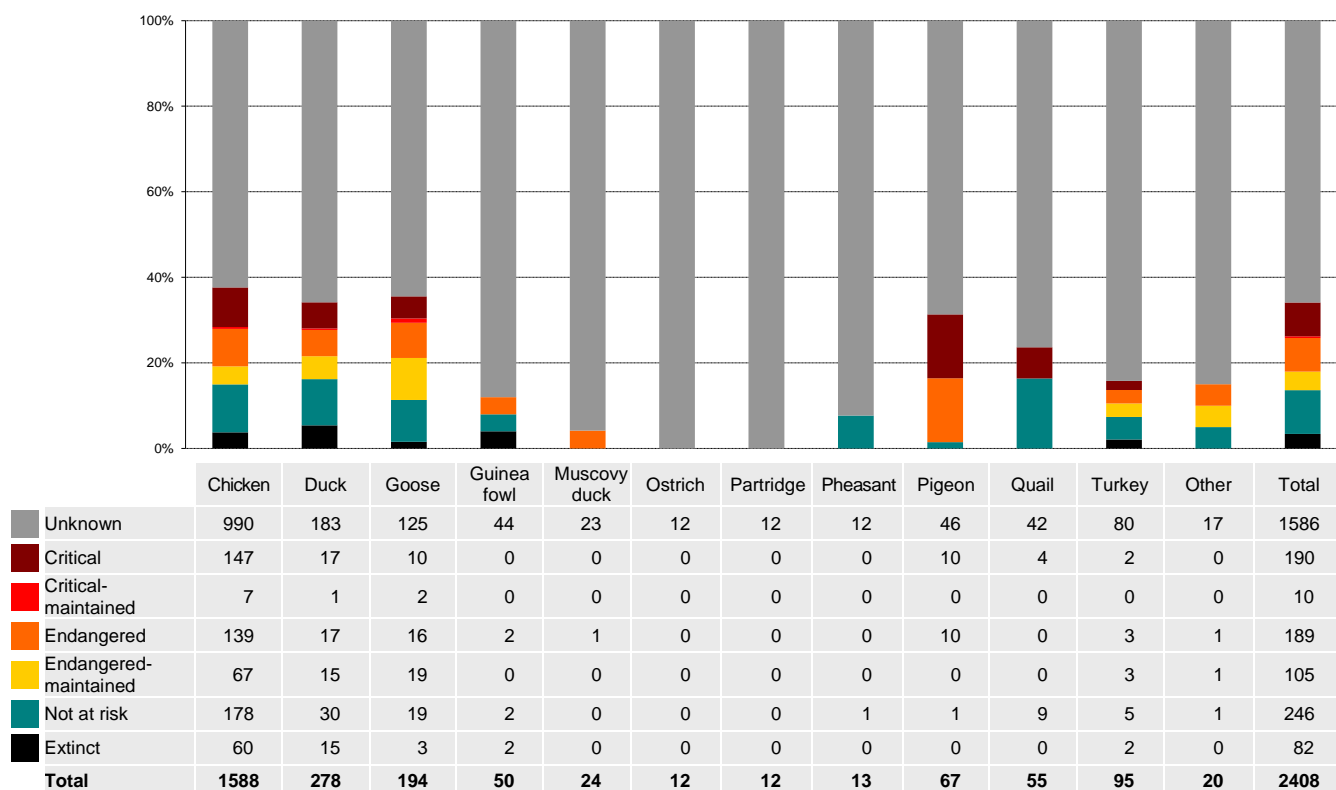
* Other: Bactrian camel × dromedary crosses, guanacos, vicuñas, guinea pigs and dogs.

Figure 7a. Risk status of the world’s avian breeds in June 2014: absolute (table) and percentage (chart) figures by species



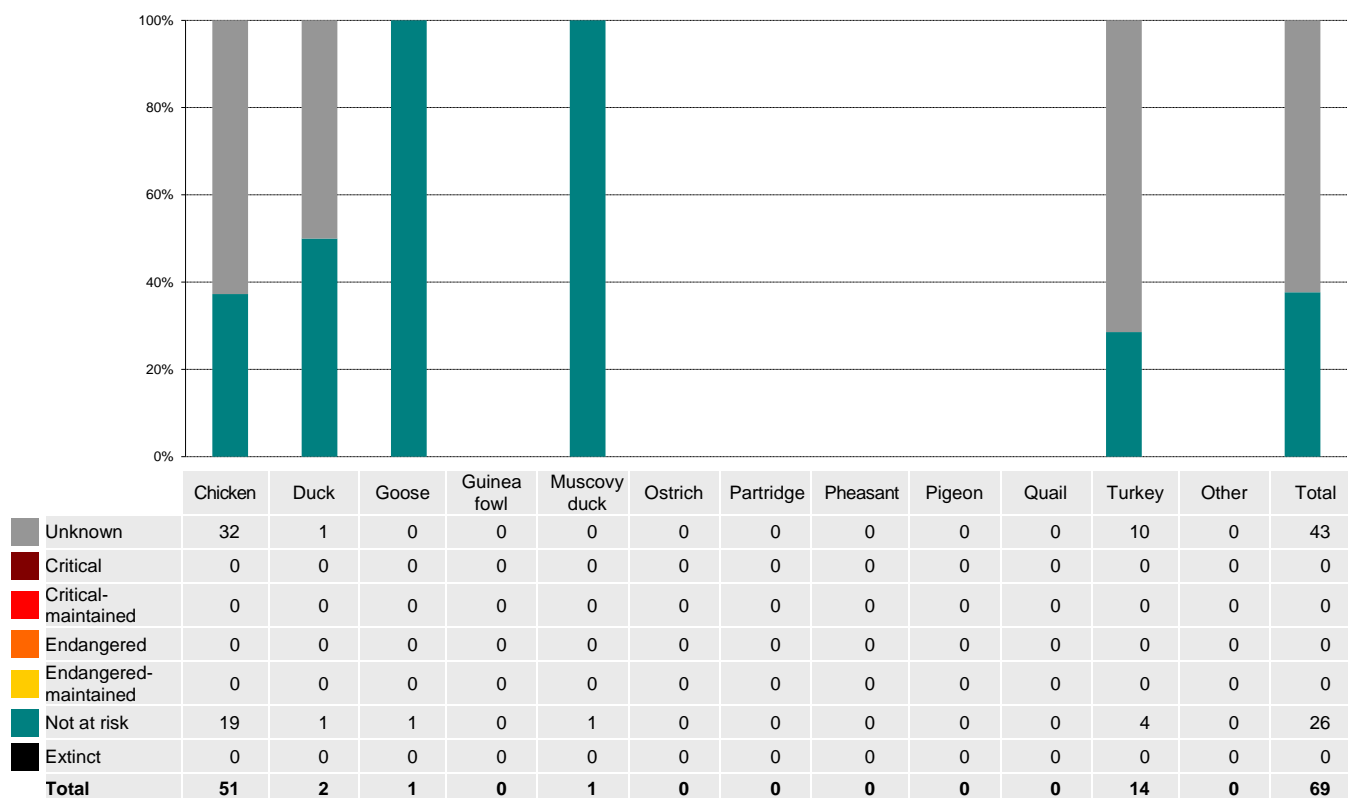
* Other: duck × Muscovy duck crossings, Chilean tinamou, cassowaries, emus, ñandus, peacocks and swallows.

Figure 7b. Risk status of the world’s avian breeds in June 2014: absolute (table) and percentage (chart) figures by species – locally adapted category



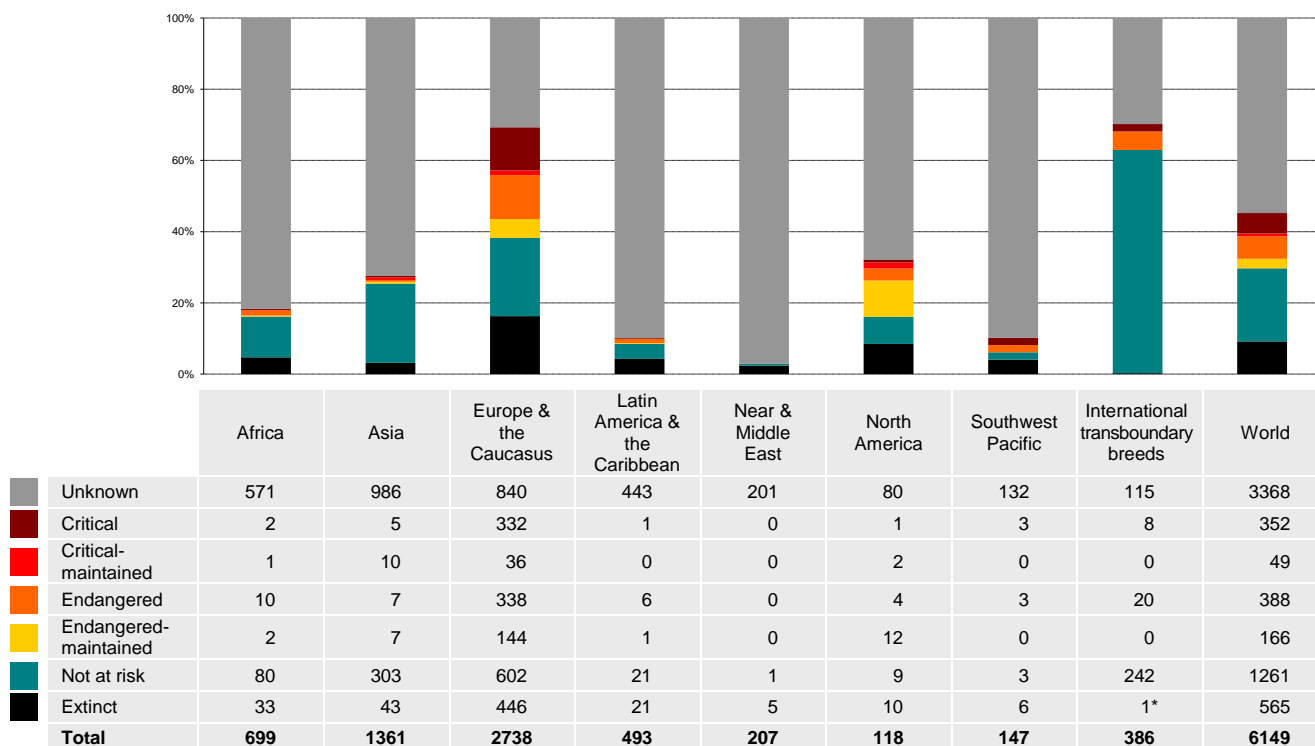
* Other: duck × Muscovy duck crossings, Chilean tinamou, cassowaries, emus, ñandus, peacocks and swallows.

Figure 7c. Risk status of the world’s avian breeds in June 2014: absolute (table) and percentage (chart) figures by species – mixed category



* Other: duck × Muscovy duck crossings, Chilean tinamou, cassowaries, emus, ñandus, peacocks and swallows.

Figure 8a. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by region



*African Aurochs, which once lived in parts of both the Africa and the Near and Middle East regions.

Figure 8b. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by region – locally adapted category

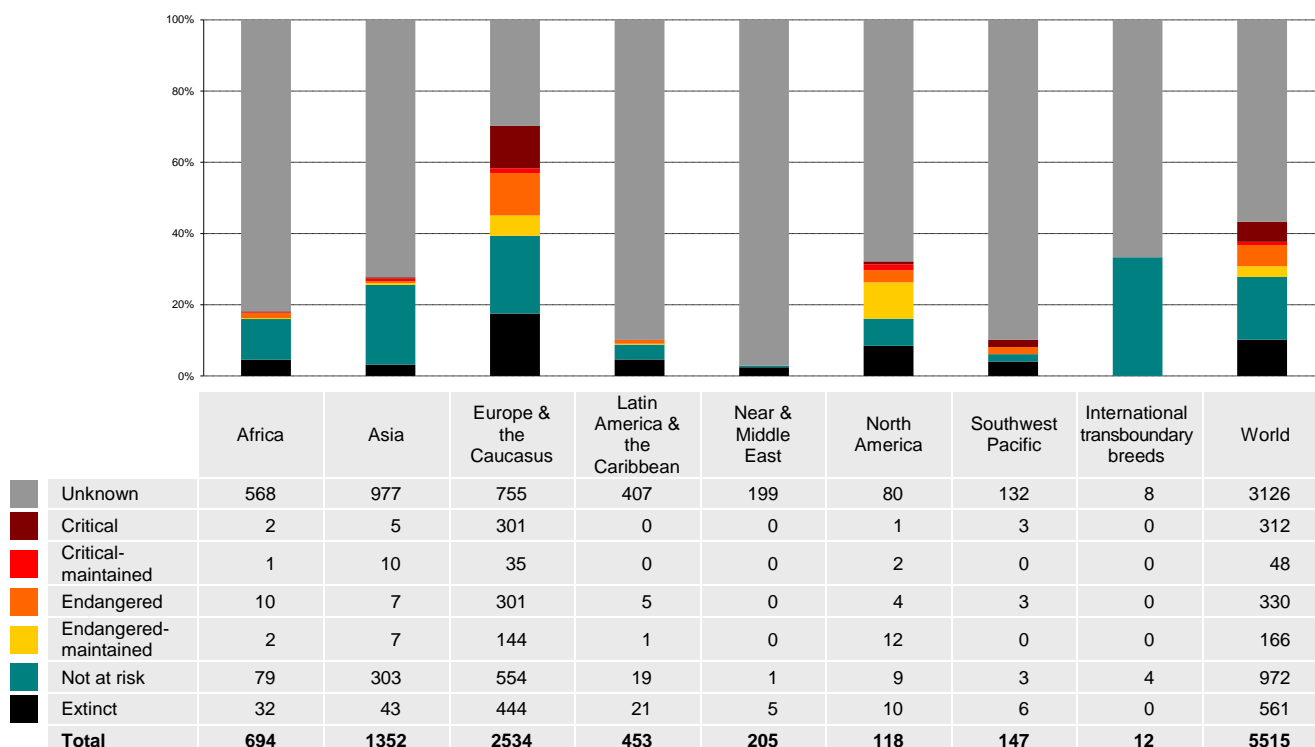


Figure 8c. Risk status of the world’s mammalian breeds in June 2014: absolute (table) and percentage (chart) figures by region – mixed category



Figure 9a. Risk status of the world’s avian breeds June 2014: absolute (table) and percentage (chart) figures by region

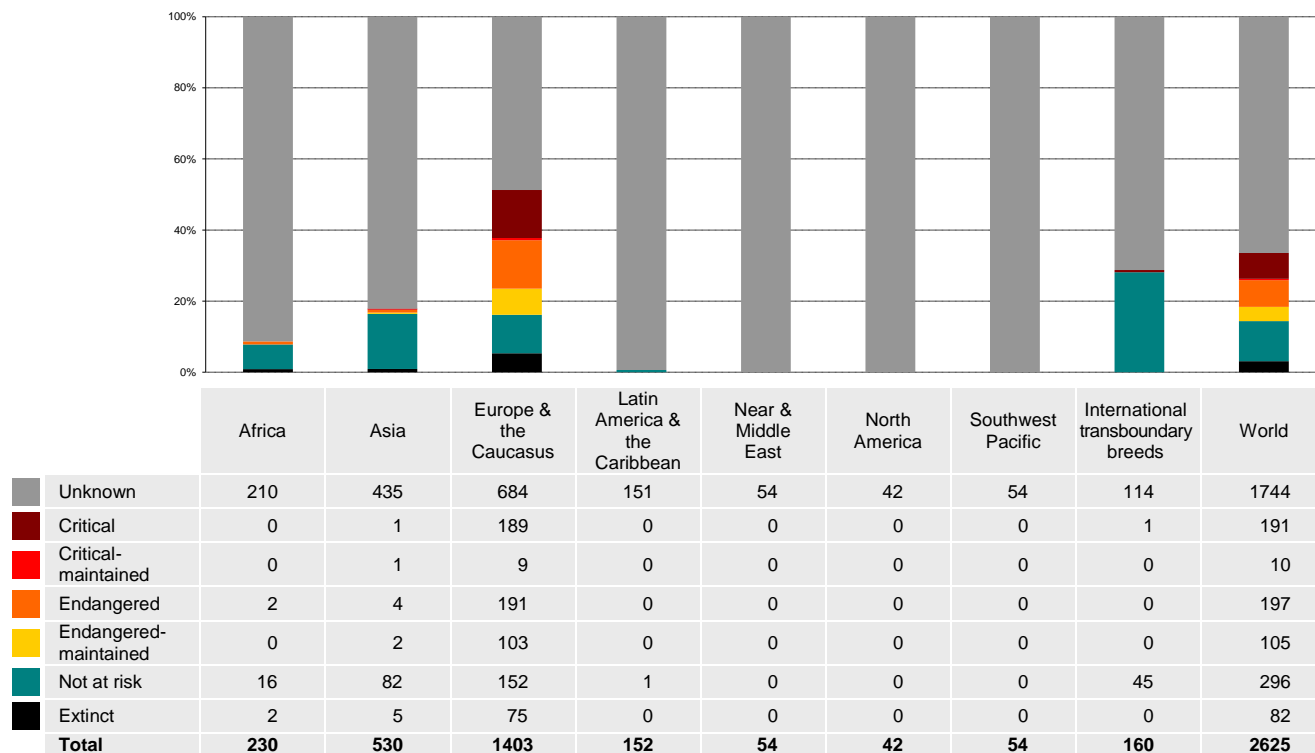


Figure 9b. Risk status of the world’s avian breeds June 2014: absolute (table) and percentage (chart) figures by region – locally adapted category

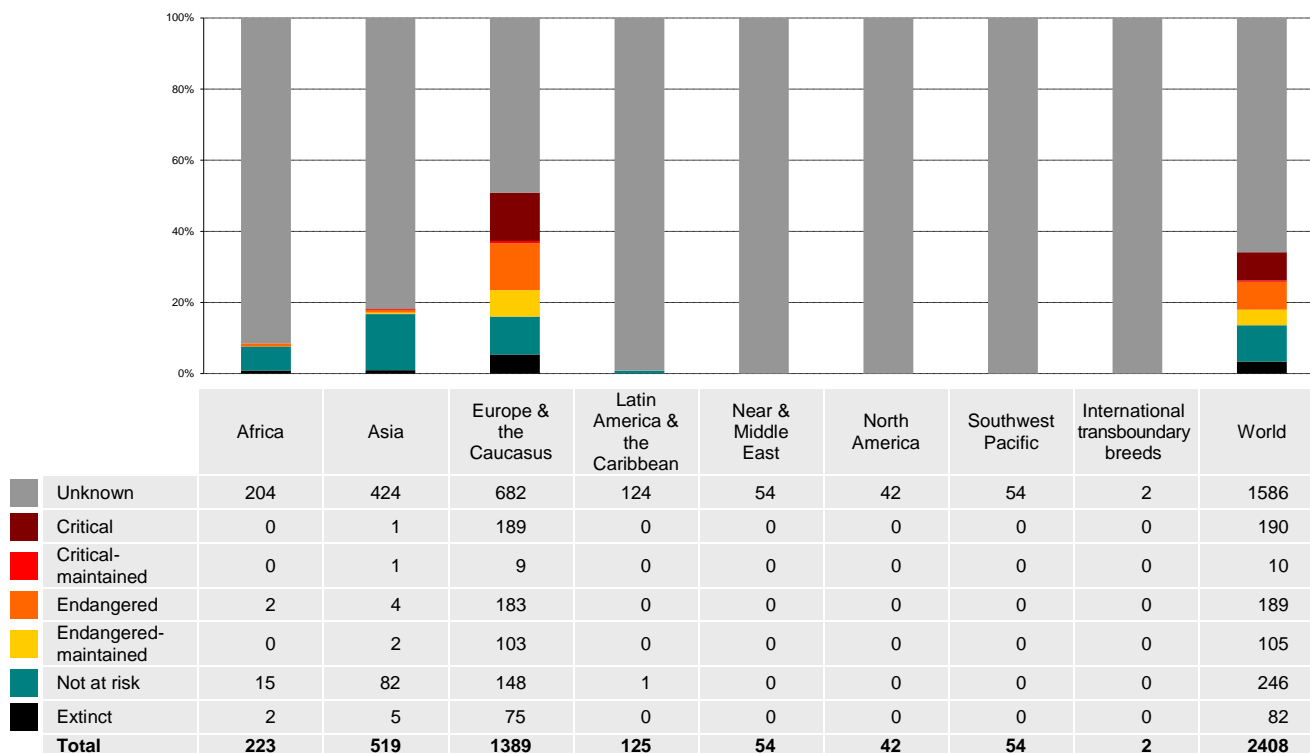
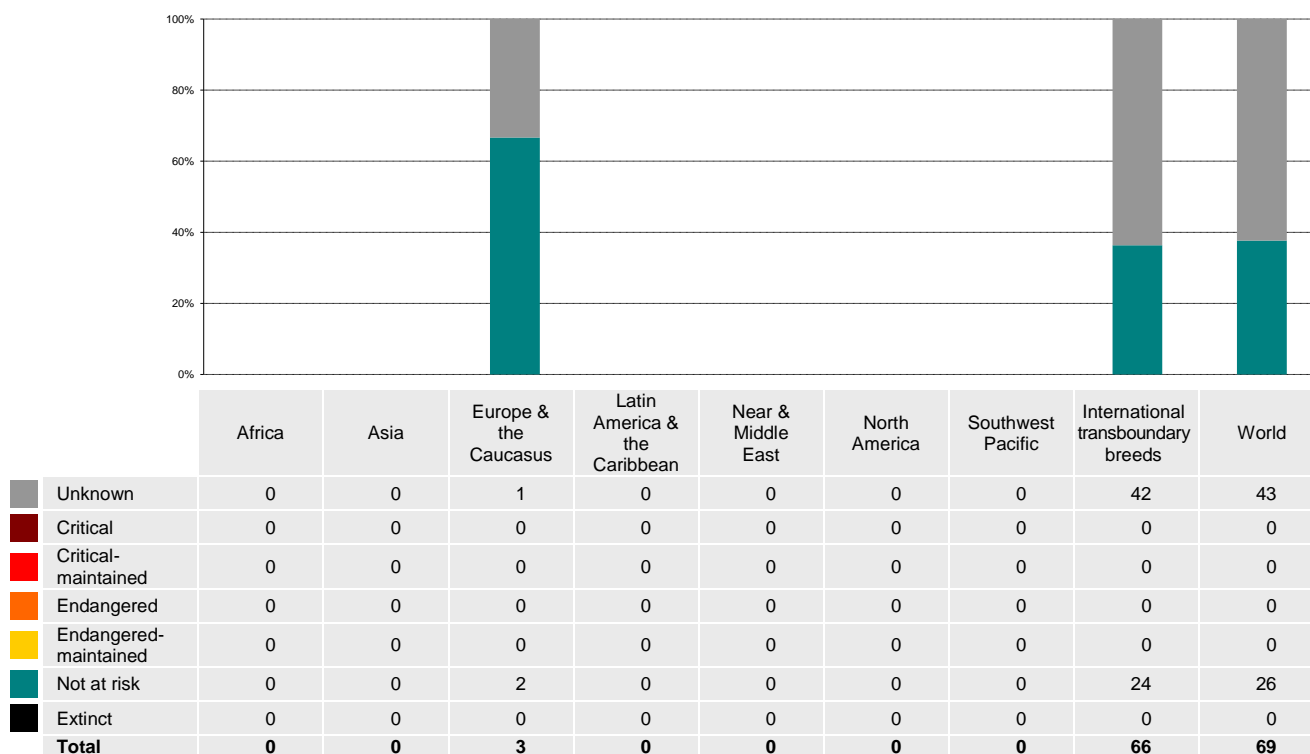


Figure 9c. Risk status of the world’s avian breeds June 2014: absolute (table) and percentage (chart) figures by region – mixed category



Tables 8 and 9 present the number of extinct mammalian and avian breeds by species and region. Europe and the Caucasus has reported far more extinct mammalian and avian breeds than any other region – 7 percent of all reported breeds are extinct. The dominance of Europe and the Caucasus in terms of the number of breeds reported extinct may relate, at least in part, to the relatively advanced state of breed inventory and monitoring in this region. The year of extinction has been reported for only 33 percent of extinct breeds (214). Thirty breeds became extinct after 2005 (Table 10). Among the 565 extinct mammalian breeds, 99 percent are classified as locally adapted breeds. All extinct avian breeds are classified as locally adapted.

Table 8. Number of extinct mammalian breeds – number of locally adapted breeds in brackets

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	International transboundary breeds	World
Ass	1 (1)	0 (0)	2 (2)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	4 (4)
Buffalo	0 (0)	0 (0)	1 (1)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	1 (1)
Cattle	20 (19)	19 (19)	120 (120)	20 (20)	1 (1)	1 (1)	2 (2)	1 (0)	184 (182)
Goat	1 (1)	2 (2)	16 (16)	0 (0)	0 (0)	0 (0)	0 (0)	0 (0)	19 (19)
Horse	6 (6)	1 (1)	71 (71)	0 (0)	0 (0)	8 (8)	1 (1)	0 (0)	87 (87)
Pig	0 (0)	15 (15)	90 (89)	1 (1)	0 (0)	0 (0)	1 (1)	0 (0)	107 (106)
Rabbit	0 (0)	0 (0)	1 (1)	0 (0)	2 (2)	0 (0)	0 (0)	0 (0)	3 (3)
Sheep	5 (5)	6 (6)	145 (144)	0 (0)	1 (1)	1 (1)	2 (2)	0 (0)	160 (159)
Total	33 (32)	43 (43)	446 (444)	21 (21)	5 (5)	10 (10)	6 (6)	1 (0)	565 (561)

Table 9. Number of extinct avian breeds (all locally adapted)

Species	Africa	Asia	Europe & the Caucasus	Latin America & the Caribbean	Near & Middle East	North America	Southwest Pacific	World
Chicken	0	5	55	0	0	0	0	60
Duck	0	0	15	0	0	0	0	15
Goose	0	0	3	0	0	0	0	3
Guinea fowl	2	0	0	0	0	0	0	2
Turkey	0	0	2	0	0	0	0	2
Total	2	5	75	0	0	0	0	82

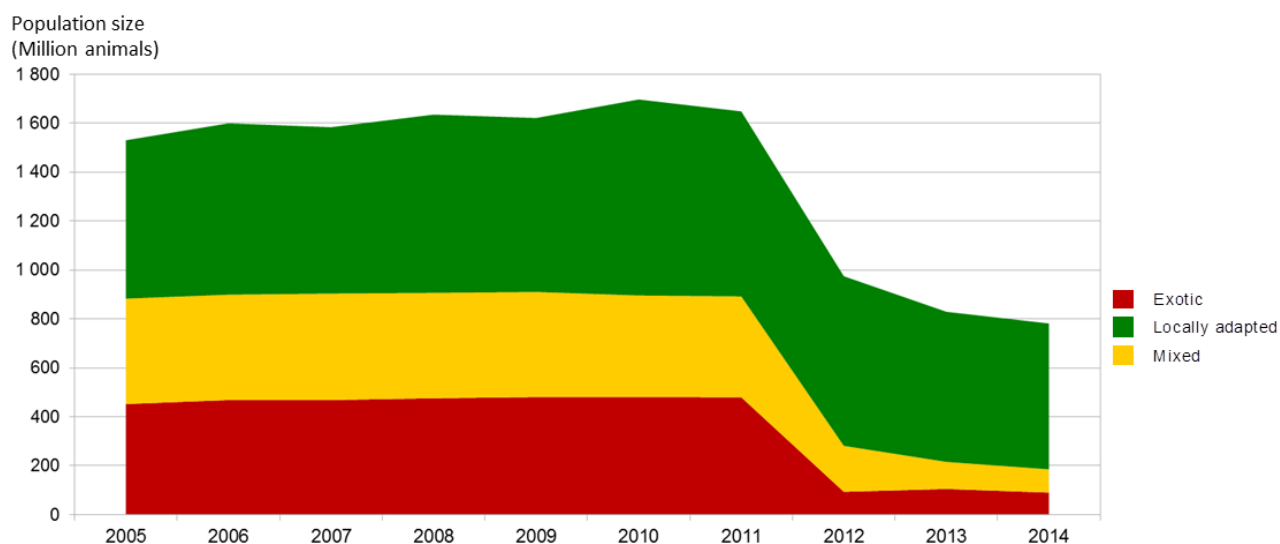
Table 10. Years of extinction

Year	Number of breeds	%
Unspecified	433	67
Before 1900	7	1
1900-1999	111	17
2000-2005	66	10
After 2005	30	5
Total	647	100

V. Trends in breed status and diversity

Figure 10 presents the data basis for the newly introduced indicator supposed to show the proportion of the total population accounted for by locally adapted breeds and its trends. For the calculation of this indicator the sum of population sizes over all locally adapted national breed populations belonging to a certain species has to be divided by the sum of population sizes built over all national breed populations (locally adapted and exotic) for the respective species. Generally the lack of population data for exotic breed populations is even more pronounced than for locally adapted breed populations and does not allow a meaningful interpretation of this indicator at this stage. The dramatic decrease in number of animal between the years 2011 and 2012 in Figure 10 is caused by the intensive uploading activities prior to the first report on the *State of the World's Animal Genetic Resources for Food and Agriculture*⁷ until the year 2001 followed by a lack of updating of population data especially for exotic breeds afterwards. The lack of updating since 2001 in combination with the ten year cut-off point becomes visible in the year 2012 where all non updated population sizes were set to unknown (zero).

Figure 10. Number of individuals belonging to locally adapted, mixed or exotic breed category – 2005 to 2014

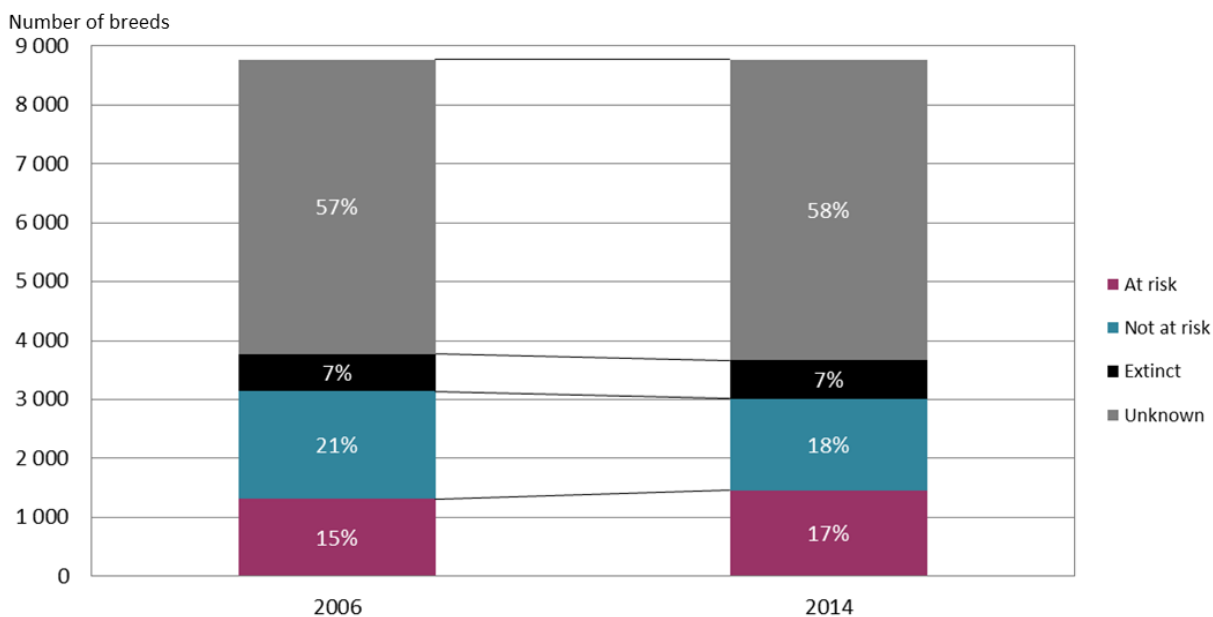


Previous attempts to summarize global trends in breed risk status have been affected by the confounding effects of ongoing corrections to breed inventories. The proposals for reducing the effects of such changes set out in the document *Targets and indicators for animal genetic resources*⁸ were applied in the calculation of the figure presented below. Figure 11 shows the trends in genetic erosion of breeds since the publication of the first report on the *State of the World's Animal Genetic Resources for Food and Agriculture*. Since the year 2006 the proportion of breeds classified as at risk increased from 15 to 17 percent, the breeds classified as not at risk decreased from 21 to 18 percent and the percentage of breeds reported to be extinct remained stable with 7 percent. The number of breeds where no risk status can be calculated due to either complete lack of information on population sizes or lack of updating of population data for a period of more than ten years is with almost 60 percent very high.

⁷ *State of the World's Animal Genetic Resources for Food and Agriculture*
(<http://www.fao.org/docrep/010/a1250e/a1250e00.htm>)

⁸ CGRFA/WG-AnGR-7/12/7 (<http://www.fao.org/docrep/meeting/026/me514e.pdf>).

Figure 11. Changes in risk status of breeds from 2006 to 2014



The figures 12a and 12b show the relationship between trends in genetic diversity expressed as quadratic regression lines and the number of breeds with unknown risk class due to missing information on population data for a period of at least 10 years. In case of local breeds there is a clear trend regarding genetic diversity of local breeds: the number of breeds being at risk is increasing over time while the number of breeds not at risk is decreasing (Fig. 12a). The trends for transboundary breeds are not that pronounced: however, the number of breeds being not at risk is decreasing while the number of breeds with unknown risk status increases steadily. The grey charts indicate that the number of local breeds with reported population data was rather high during the preparation phase for the first report on the *State of the World’s Animal Genetic Resources for Food and Agriculture* and decreases since then while the number of transboundary breeds without reported population data in DAD-IS is increasing over the last years.

Figure 12a. Trends in risk status of local breeds and number of local breeds with unknown risk status from 2005 to 2014

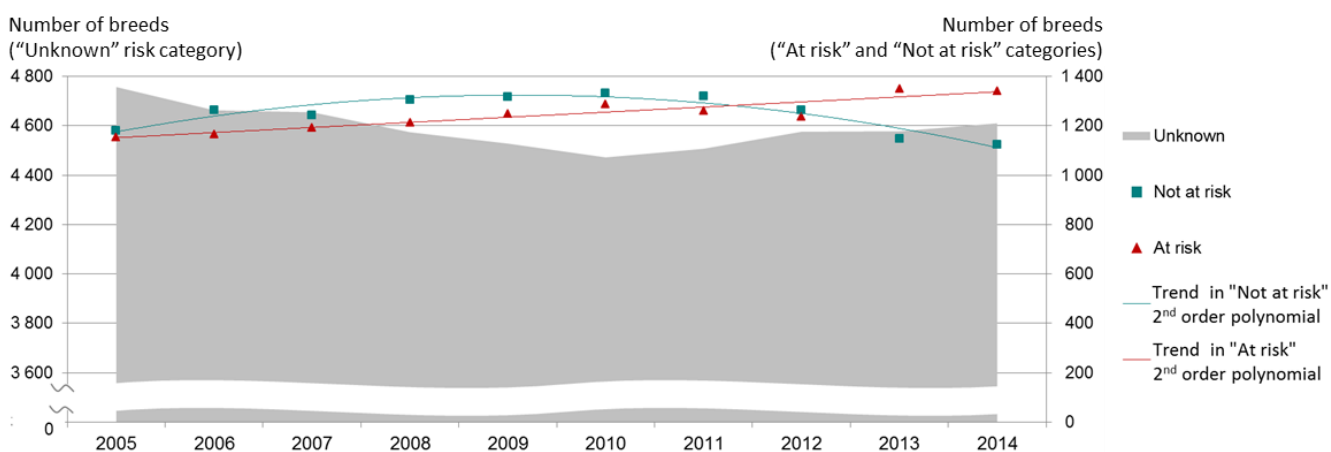
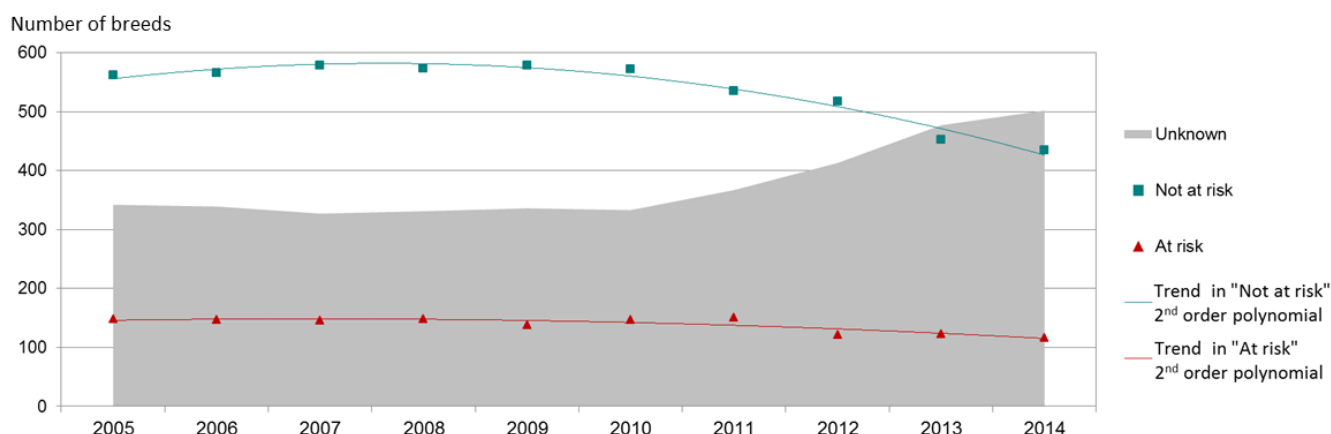


Figure 12b. Trends in risk status of transboundary breeds and number of transboundary breeds with unknown risk status from 2005 to 2014



VI. Conclusions

During the period between June 2012 and June 2014 the coverage of the Global Databank for Animal Genetic Resources improved. However, breed-related information remains far from complete. For almost 60 percent of all reported breeds, risk status is not known because of missing population data or lack of recent updates. The completeness of data is shown, by country, in Annexes 1 and 2.

Previous attempts to summarize global trends in breed risk status have been affected by the confounding effects of ongoing corrections to breed inventories. The proposals for reducing the effects of such changes set out in the document *Targets and indicators for animal genetic resources*⁹ were applied in the calculation of the figures presented in the present report. This allows for the first time a meaningful interpretation of trends in risk status of breeds showing an increase of breeds being at risk of extinction over the last ten years. However, the lack of population data hides the real degree of erosion. National Coordinators also need to enter any historical population data that are available to them, as this will provide a more complete set of data with which to calculate trends in breed population size, breed structure and diversity.

The current state of data availability and updating means that it is not possible to draw reliable conclusions regarding global trends in diversity as represented by the proportion of the total population accounted for by locally adapted breeds. If future status and trends reports are to provide meaningful inputs to decision-making in animal genetic resources management, there is an urgent need for National Coordinators for the Management of Animal Genetic Resources to improve (i) the completeness and frequency of reporting on the sizes of their national breed populations, including for the exotic breeds, and (ii) to classify all their national breed populations into adaptedness categories (locally adapted or exotic).

Furthermore, as cross-bred animals probably represent the majority of domestic animals in many countries a way to define cross breed populations and to capture the size of national crossbred populations in DAD-IS needs to be investigated to present a realistic proportion of the total population accounted for by locally adapted breeds.

Due to the lack of data regarding the adaptedness class of breeds, figures and tables based on this classification system can only be considered as examples for presenting such type of data in future reports.

⁹ CGRFA/WG-AnGR-7/12/7 (<http://www.fao.org/docrep/meeting/026/me514e.pdf>).

Annex 1

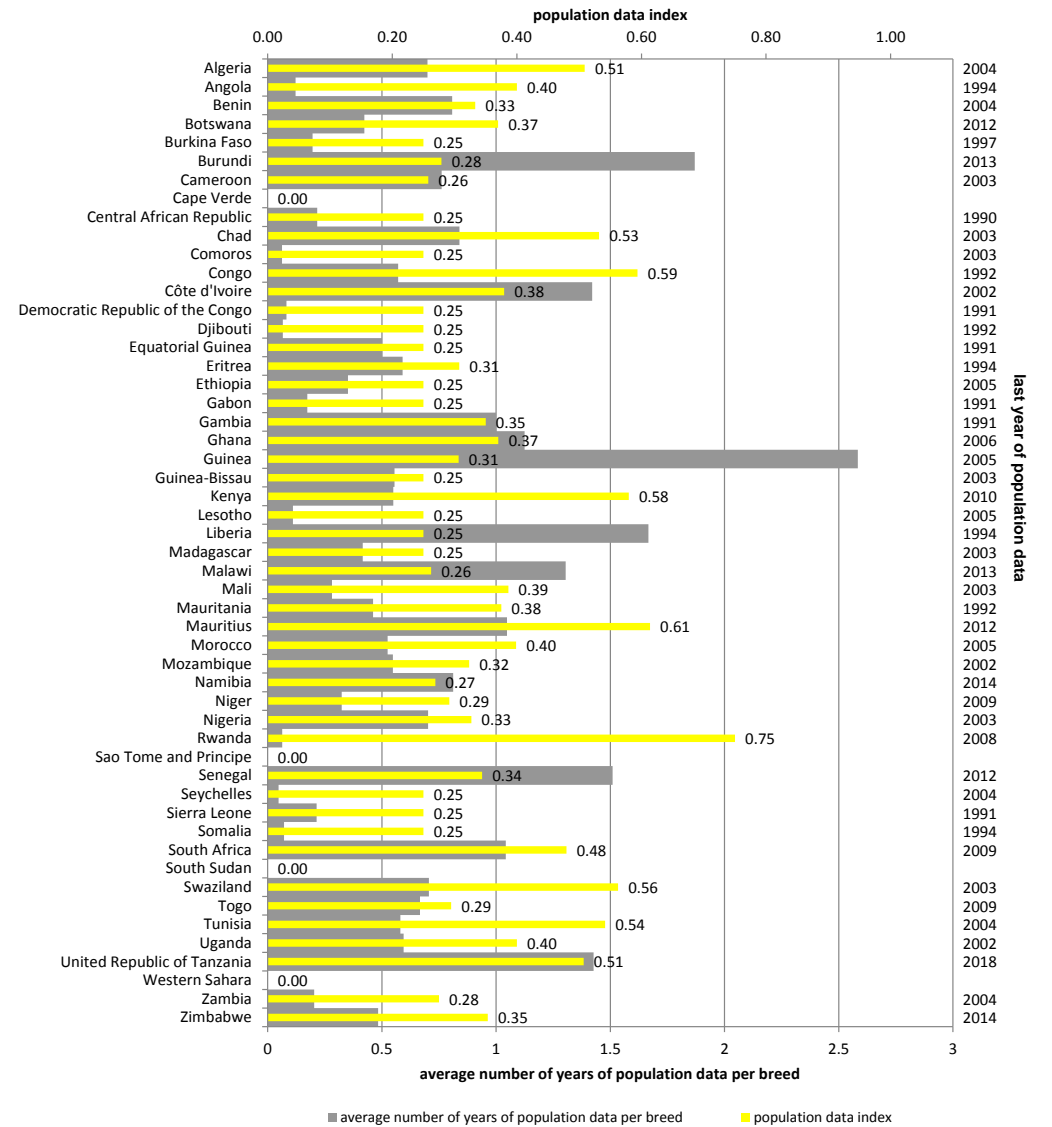
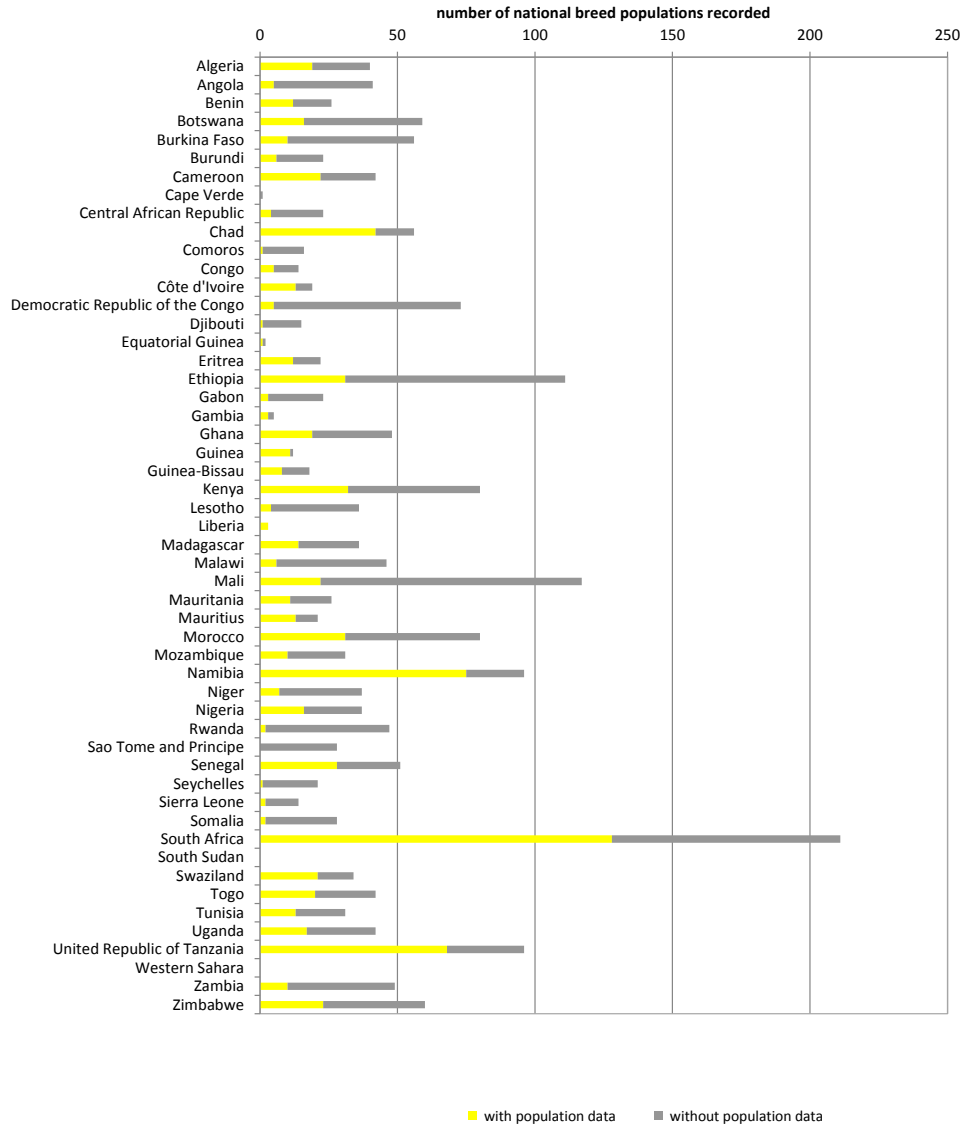
Status of population data reported by each country and region

- 1.1. Africa
- 1.2. Asia
- 1.3. Europe and the Caucasus
- 1.4. Latin America and the Caribbean
- 1.5. Near and Middle East
- 1.6. North America
- 1.7. Southwest Pacific

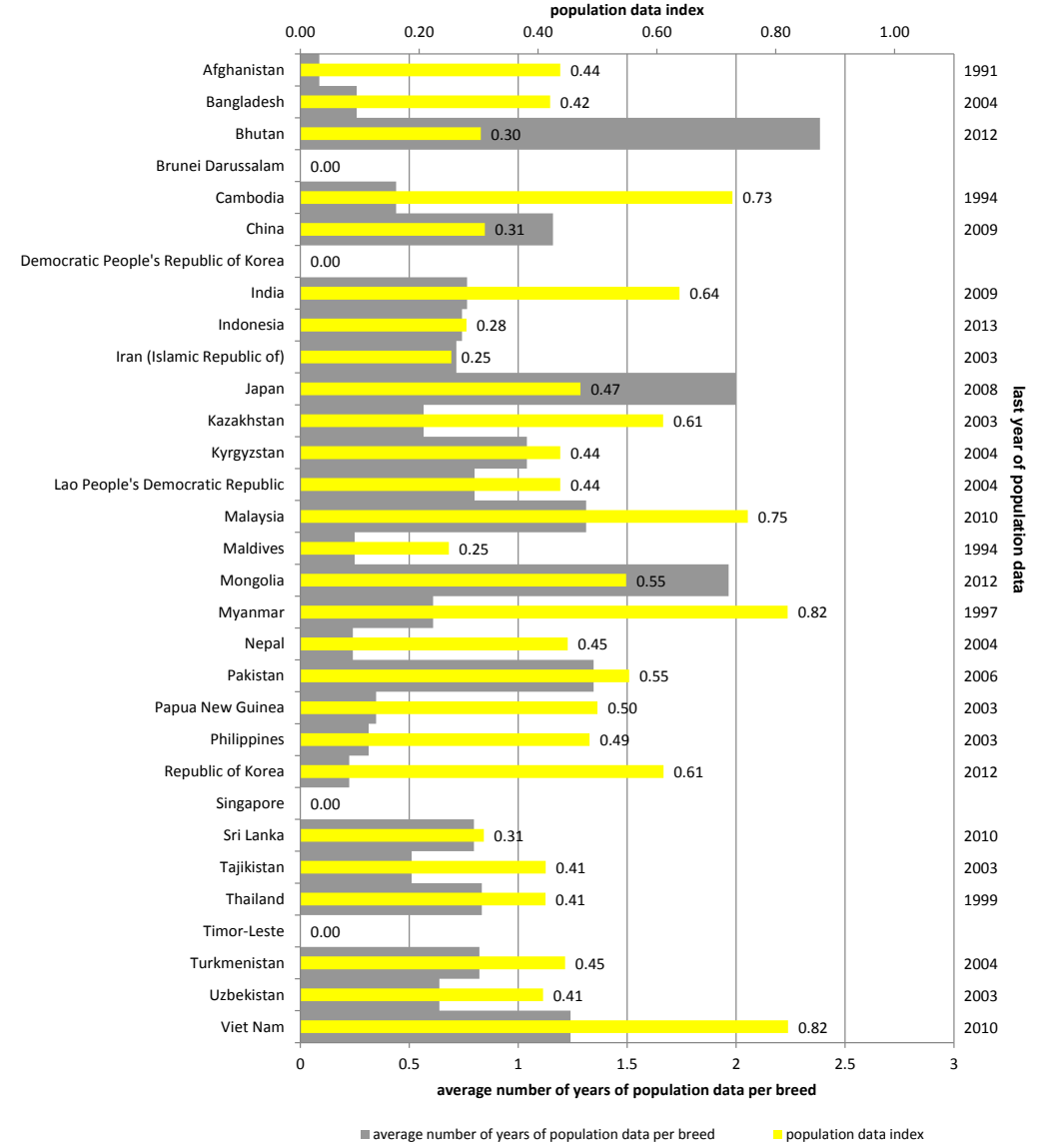
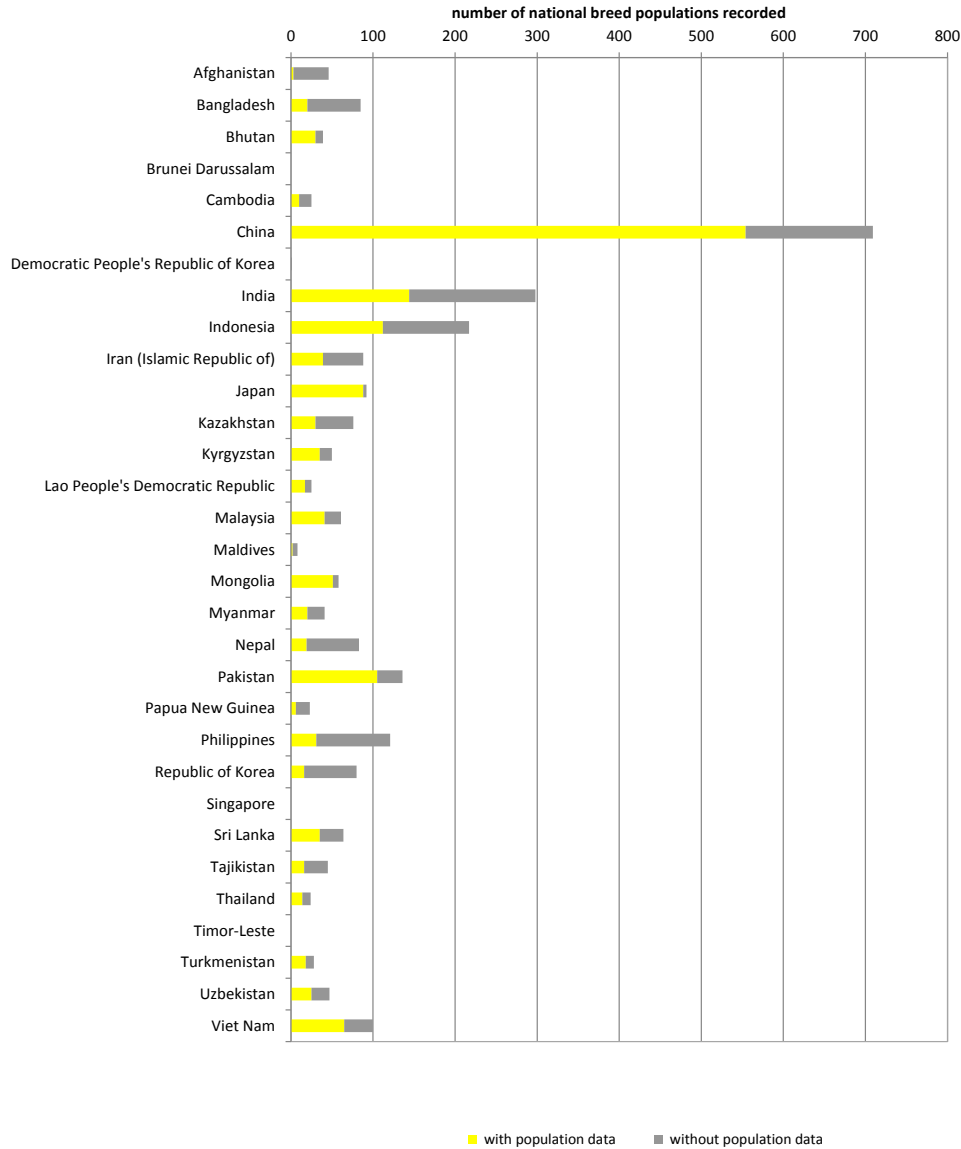
This annex allows countries to view the state of completeness of their breed population data in DAD-IS. They can also see how their progress in entering population data compares to that of other countries in their respective regions.

Two graphics are presented for each region. The first shows the number of breeds for which population data have been recorded and the number of breeds that have been entered into DAD-IS for which no population data have yet been recorded. The second graphic presents two further measures of data completeness: the average number of years for which population has been reported per breed and the “population data index”. The latter relates only to breeds for which some population data have been entered – it represents the fraction of selected population data fields (population size, number of breeding females, number of breeding males and the percentage of females bred to males of the same breed) that contain data, averaged across breeds and years. The figures also show the most recent year for which population data are available from a given country. Dependent territories are listed below the respective country.

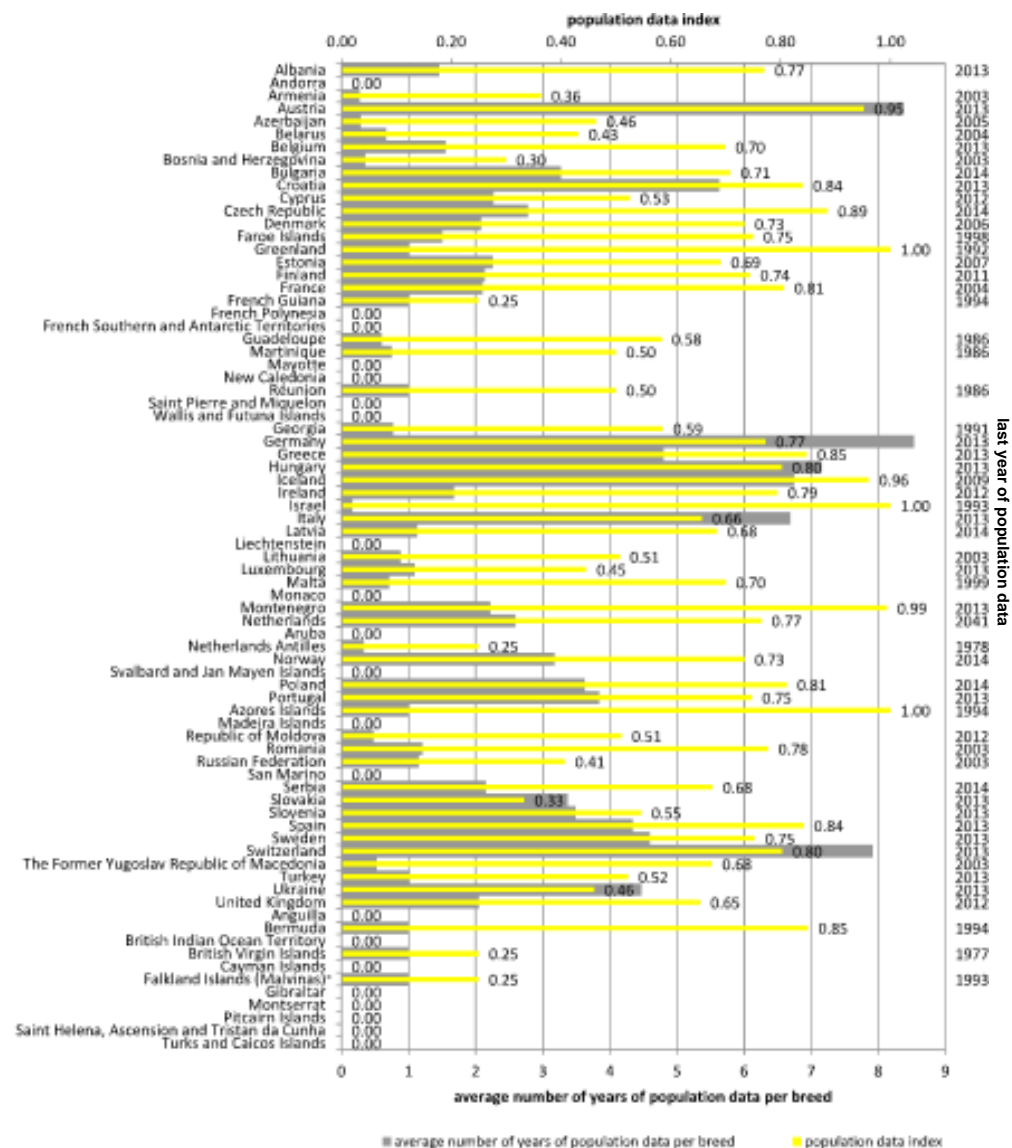
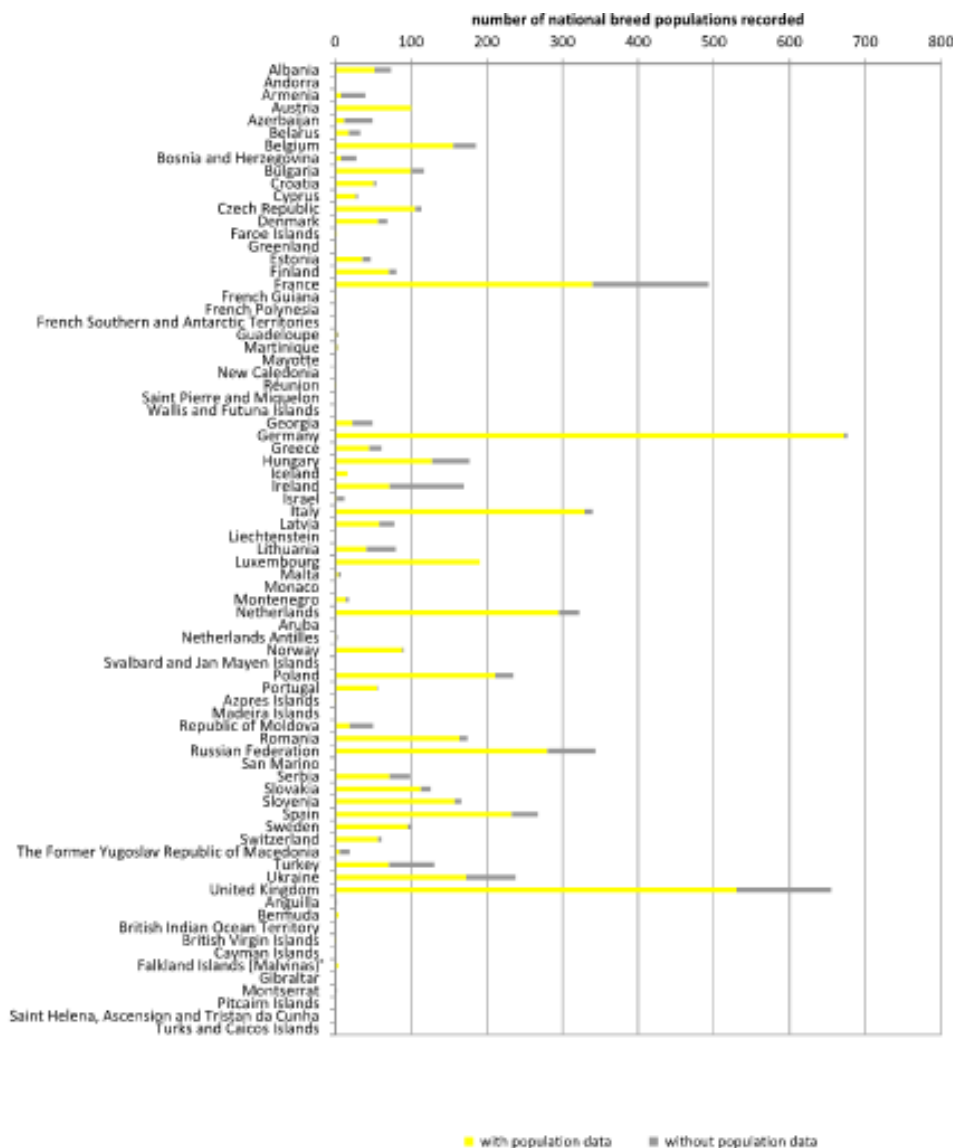
1.1 Africa



1.2 Asia

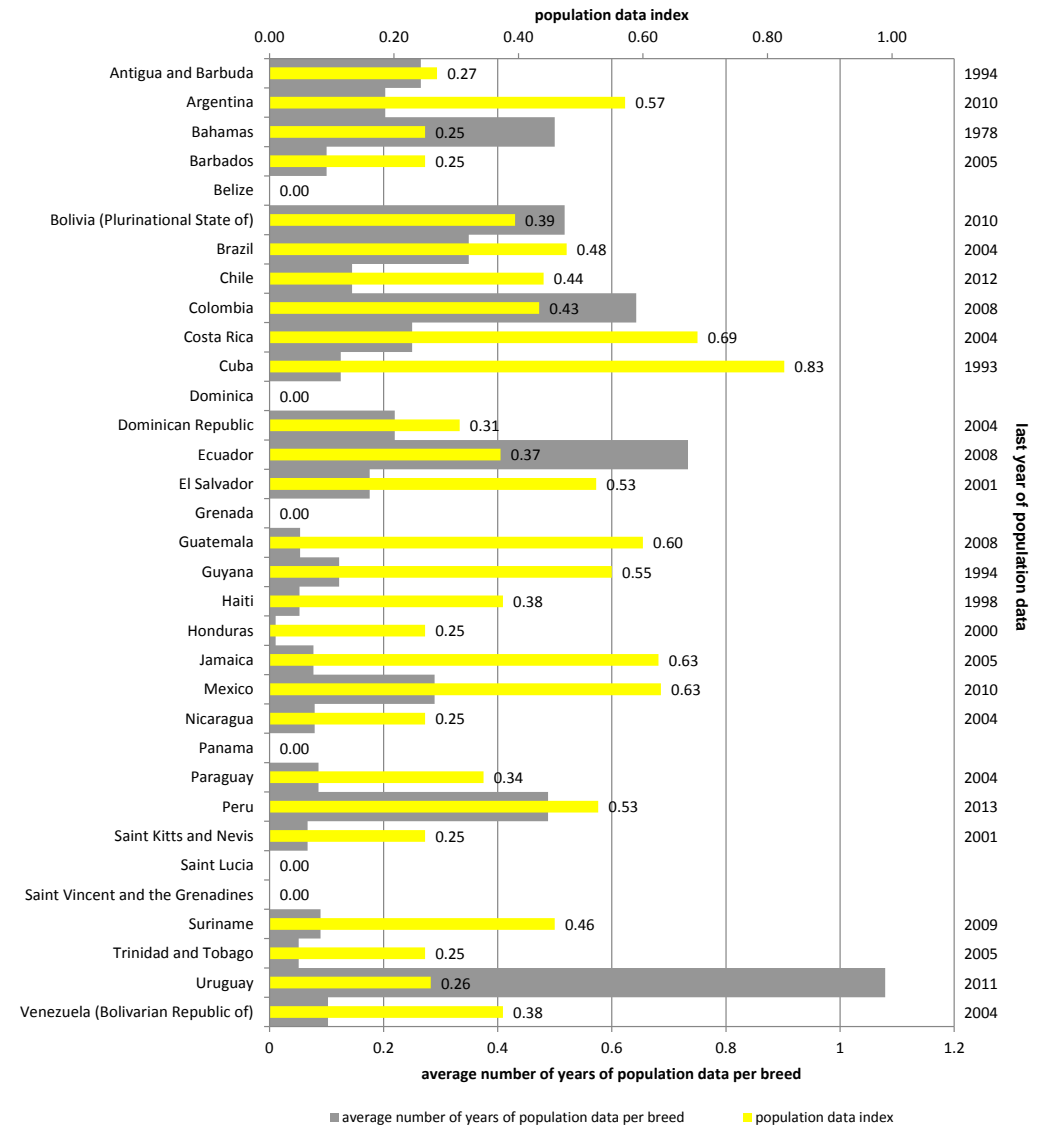
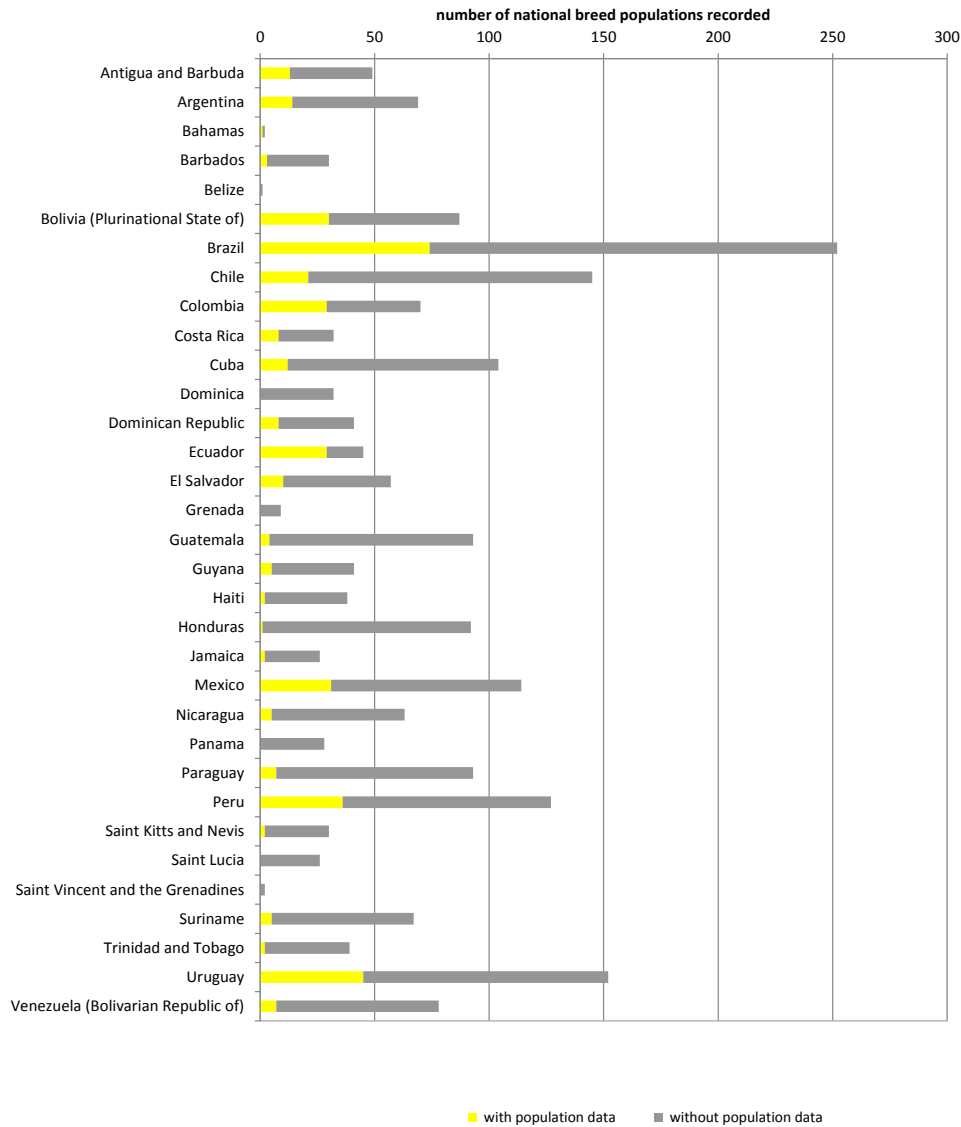


1.3 Europe and the Caucasus

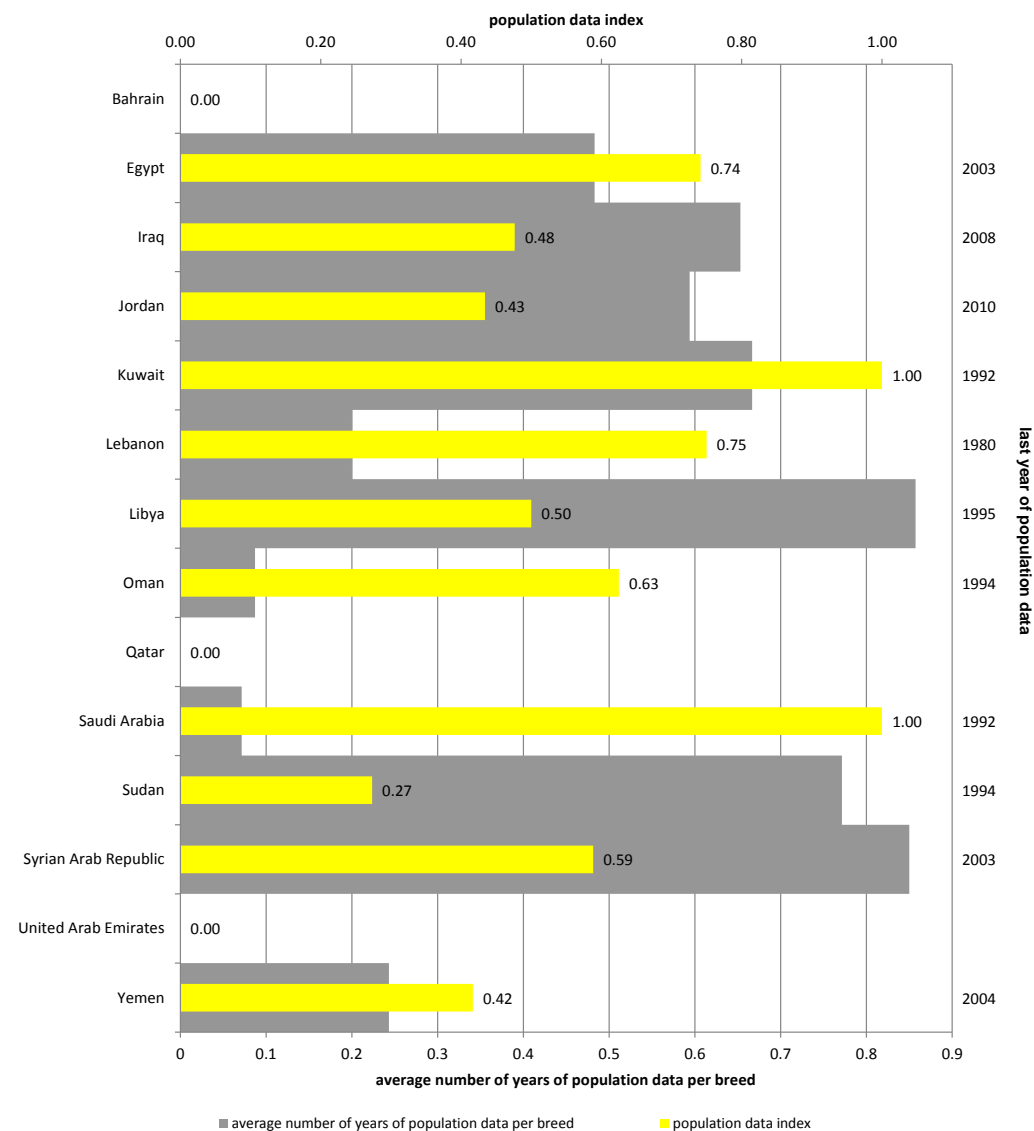
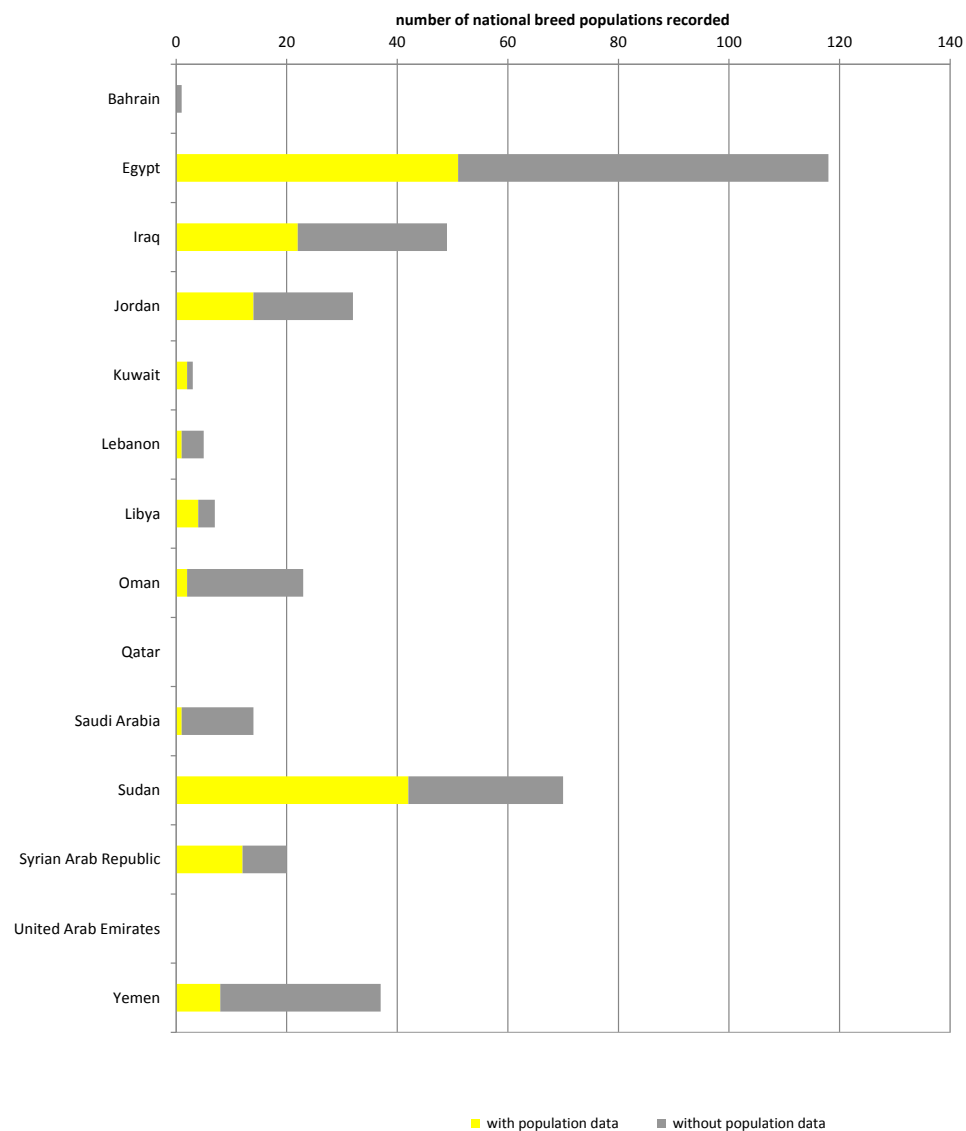


*A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas). (Editorial directive ST/CS/SER.A/42, United Nations Secretariat, 3 August 1999)

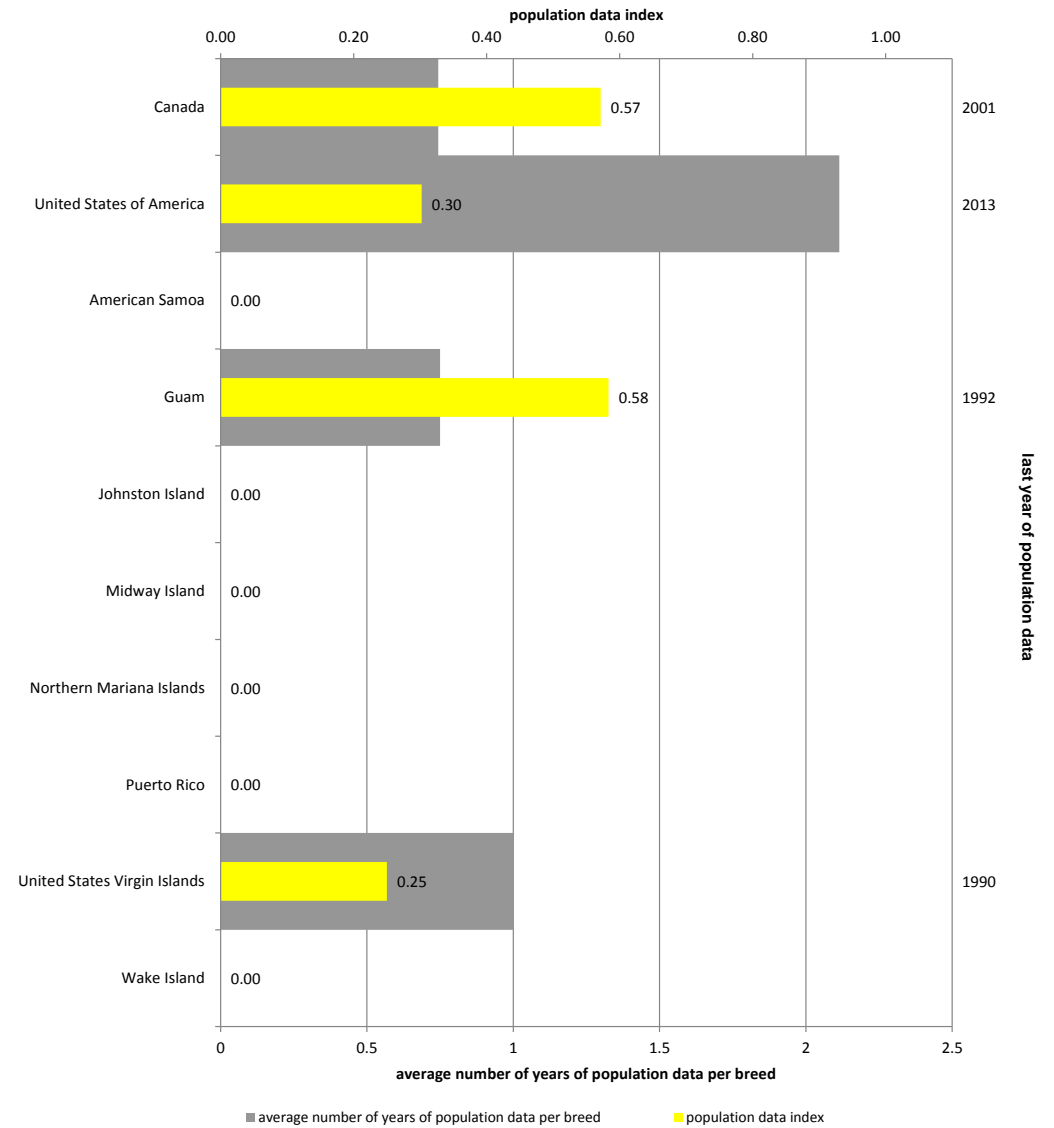
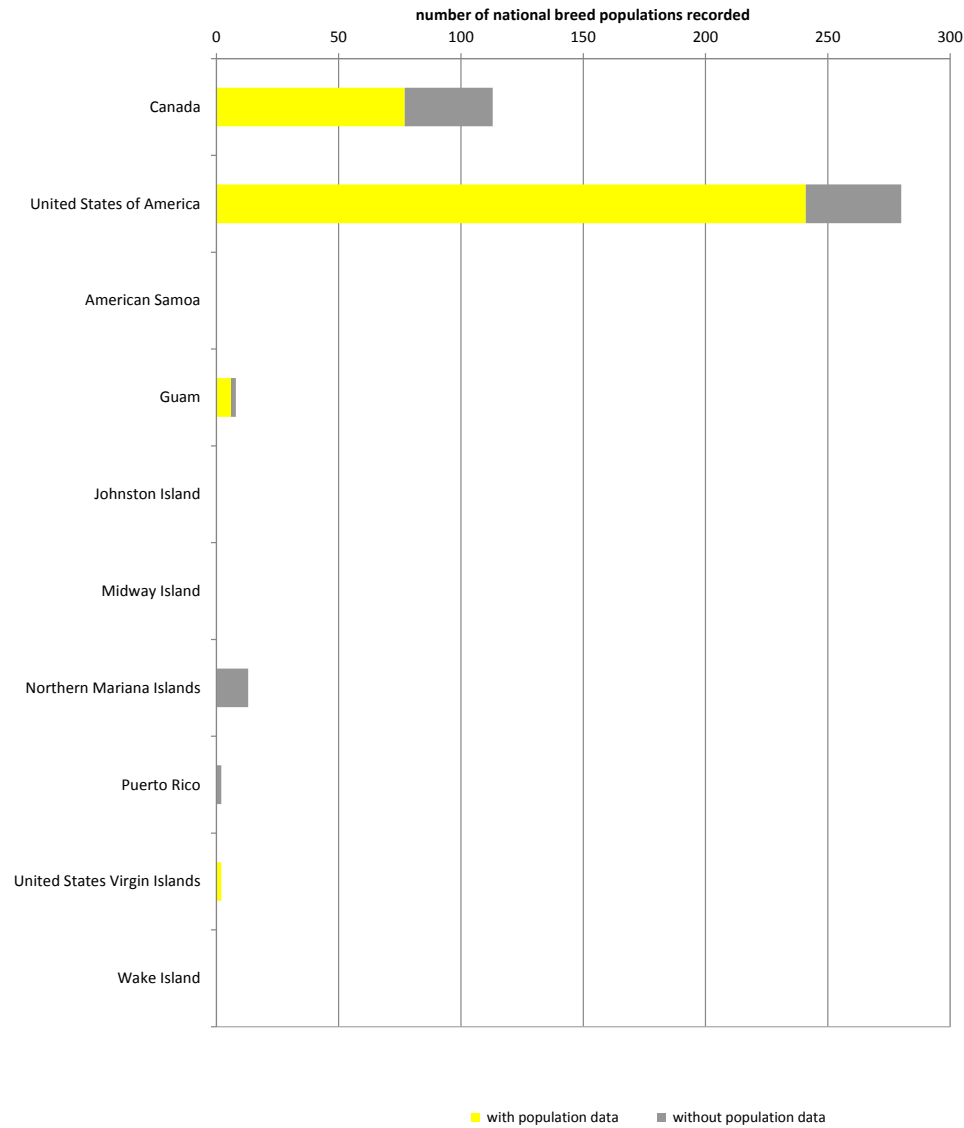
1.4 Latin America and the Caribbean



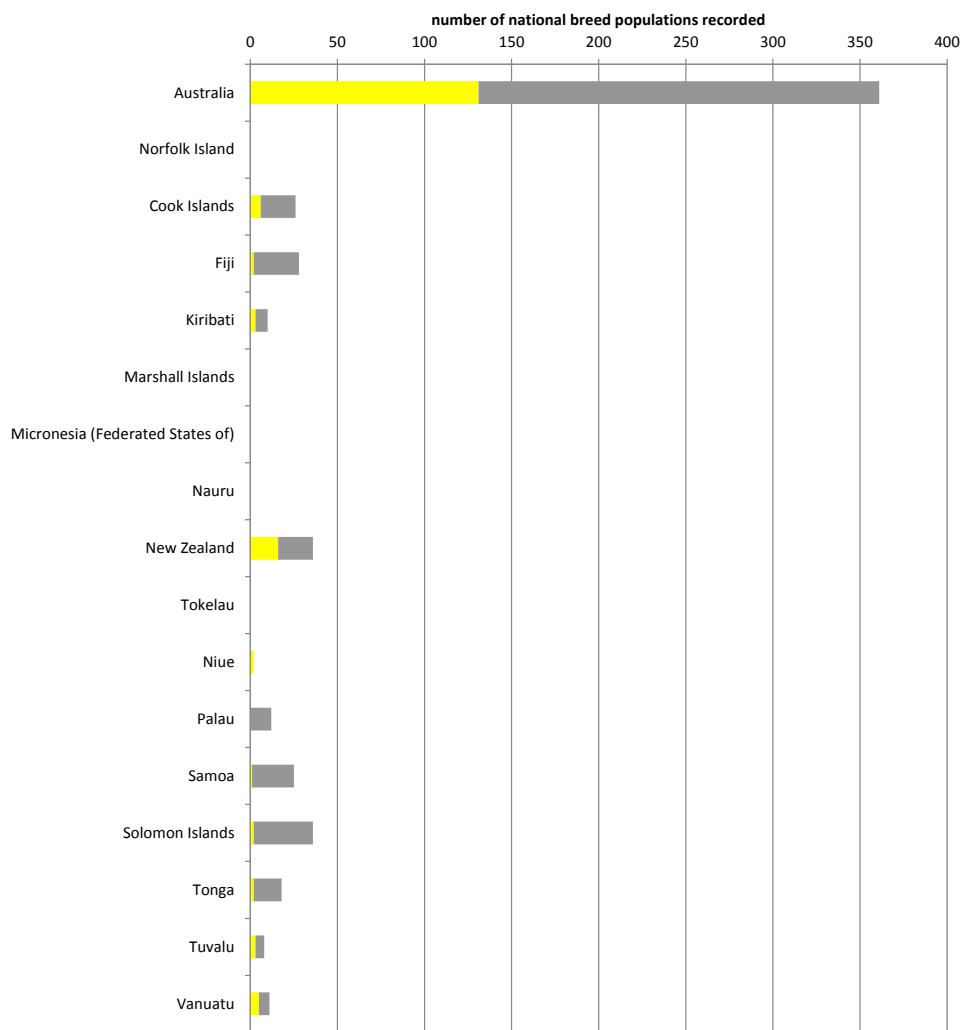
1.5 Near and Middle East



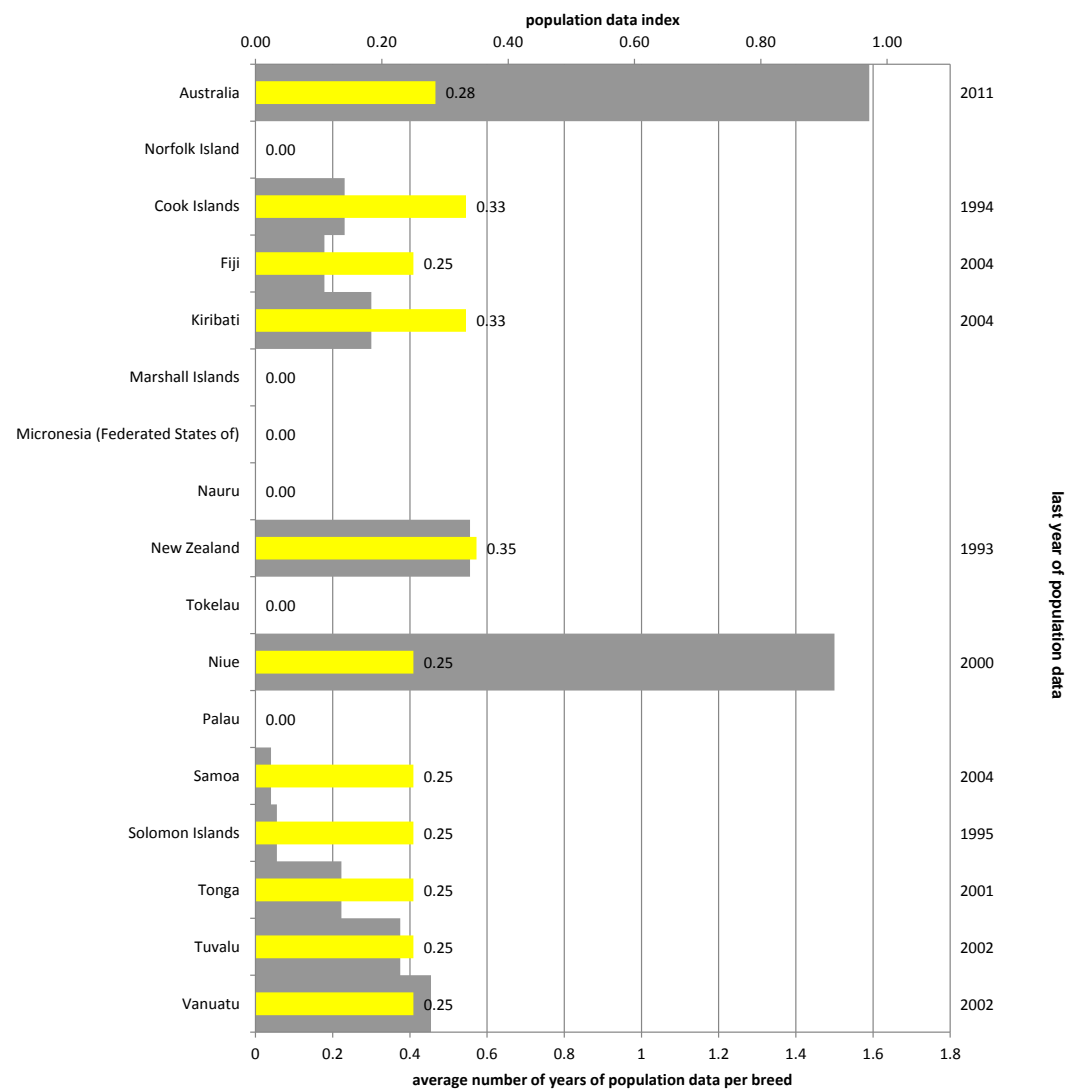
1.6 North America



1.7 Southwest Pacific



■ with population data ■ without population data



■ average number of years of population data per breed ■ population data index

Annex 2

Number of local and transboundary breeds by risk status category reported by each country and region

- 2.0. Regional overview
 - 2.1. Africa
 - 2.2. Asia
 - 2.3. Europe and the Caucasus
 - 2.4. Latin America and the Caribbean
 - 2.5. Near and Middle East
 - 2.6. North America
 - 2.7. Southwest Pacific

The tables in this annex show the number of local, regional transboundary and international transboundary breeds and their respective risk statuses by region and by country. Dependent territories are listed below the respective country. The tables will help countries to identify the need for action in surveying and monitoring and in conservation. Number of local, exotic breeds for country is given in brackets.

2.0 Regional Overview	Local			Regional			International			Total
Region	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Africa	15	77	705	2	19	76	12	173	85	1164
Asia	37	369	1357	0	16	64	13	133	107	2096
Europe and the Caucasus	1262	652	1432	80	102	92	25	239	151	4035
Latin America and the Caribbean	8	16	573	0	6	21	9	197	109	939
Near and Middle East	0	1	250	0	0	5	2	35	33	326
North America	14	6	111	5	3	11	8	113	70	341
Southwest Pacific	6	2	182	0	1	4	9	150	75	429
World	1342	1123	4610	87	147	273	29	287	229	8127

2.1 Africa	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Algeria	0	0	16	0	0	8	1	7	2	34
Angola	0	0	18	0	0	3	0	18	1	40
Benin	0	0	10	0	2	5	0	7	1	25
Botswana	2	1	6	0	3	3	0	39	4	58
Burkina Faso	0	0	22	0	3	7	0	15	8	55
Burundi	0	4	3 (3)	0	0	0	0	13	3	23
Cameroon	0	0	21	1	4	5	0	6	2	39
Cape Verde	0	0	0	0	0	0	0	0	1	1
Central African Republic	0	0	9	0	4	2	0	6	2	23
Chad	0	0	35	0	2	9	0	3	6	55
Comoros	0	0	7	0	0	1	0	7	1	16
Congo	0	0	3	0	1	2	0	7	1	14
Côte d'Ivoire	0	0	10	0	3	3	0	2	1	19
Democratic Republic of the Congo	0	0	24	0	1	4	1	37	6	73
Djibouti	0	0	9	0	0	3	0	1	1	14
Equatorial Guinea	0	0	0	0	1	0	0	1	0	2

2.1 Africa	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Eritrea	0	0	6	0	0	11	0	2	3	22
Ethiopia	0	3	66	0	1	15	0	18	6	109
Gabon	0	0	5 (1)	0	0	5	0	10	2	22
Gambia	0	0	0	0	0	1	0	3	0	4
Ghana	0	1	20	0	2	5	0	14	5	47
Guinea	0	2	4	0	2	0	0	3	0	11
Guinea-Bissau	0	0	4	0	1	1	0	12	0	18
Kenya	0	7	19	0	4	6	1	40	3	80
Lesotho	0	1	9 (4)	0	1	0	0	21	3	35
Liberia	0	0	0	0	1	1	0	1	0	3
Madagascar	0	0	17	0	0	0	0	14	3	34
Malawi	0	4	9	0	1	1	0	25	3	43
Mali	0	0	57	0	5	14	1	26	9	112
Mauritania	0	0	6	0	3	8	0	7	2	26
Mauritius	2	0	4 (1)	1	0	0	1	12	1	21
Morocco	0	1	41	0	0	4	0	24	9	79
Mozambique	0	0	12	0	1	3	0	13	1	30
Namibia	10	14	6	1	4	2	0	52	7	96
Niger	0	1	22	0	4	5	0	3	2	37
Nigeria	0	0	14	1	5	12	0	2	2	36
Rwanda	1	0	11	0	0	1	2	27	3	45
Sao Tome and Principe	0	0	6	0	0	1	0	18	3	28
Senegal	0	9 (1)	5	0	4	4	0	19	9	50
Seychelles	0	0	1	1	0	1	0	16	1	20
Sierra Leone	0	0	0	0	1	0	1	12	0	14
Somalia	0	0	18	0	0	5	0	4	1	28
South Africa	0	0	66	1	3	6	3	91	19	189
South Sudan	0	0	0	0	0	0	0	0	0	0
Swaziland	0	0	15	0	1	3	0	15	0	34
Togo	0	0	7	0	1	10	0	13	10	41
Tunisia	0	0	8	0	0	1	1	8	11	29
Uganda	0	0	13	0	3	7	1	14	4	42
United Republic of Tanzania	0	28	20	0	4	4	0	27	4	87
Western Sahara	0	0	0	0	0	0	0	0	0	0
Zambia	0	0	15	0	0	2	1	25	5	48
Zimbabwe	0	1	6	0	3	2	2	36	6	56

2.2 Asia	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Afghanistan	0	0	37	0	1	6	0	1	1	46
Bangladesh	0	0	48	0	2	4	1	15	11	81
Bhutan	1	21	3	0	2	0	1	8	3	39
Brunei Darussalam	0	0	0	0	0	0	0	0	0	0
Cambodia	0	0	16	0	0	5	0	4	0	25
China	9	217	381	0	7	3	4	47	15	683
Democratic People's Republic	0	0	1	0	0	0	0	0	0	1
India	0	16	207	0	10	23	1	32	9	298
Indonesia	1	29	116 (20)	0	1	3	1	32	27	210
Iran (Islamic Republic of)	0	0	59	0	1	4	2	10	9	85
Japan	8	7	33	0	0	1	0	26	14	89
Kazakhstan	0	0	46	0	1	8	1	12	6	74
Kyrgyzstan	0	0	26	0	0	9	0	7	7	49
Lao People's Democratic	0	0	16	0	0	3	0	4	2	25
Malaysia	3	10	11	0	1	5	0	25	5	60
Maldives	0	0	4	0	0	0	0	3	1	8
Mongolia	0	1	39	0	1	5	0	10	2	58
Myanmar	0	0	19	0	0	1	1	16	4	41
Nepal	0	0	33	0	4	10	2	22	10	81
Pakistan	0	34	70	0	3	10	0	14	4	135
Papua New Guinea	0	0	9	0	0	1	0	13	0	23
Philippines	0	0	44	0	1	3	1	54	15	118
Republic of Korea	8	1	26	0	0	1	2	26	11	75
Singapore	0	0	0	0	0	0	0	0	0	0
Sri Lanka	1	7	13	0	5	4	1	30	3	64
Tajikistan	0	0	20	0	1	12	0	9	1	43
Thailand	0	0	18	0	0	5	0	1	0	24
Timor-Leste	0	0	0	0	0	0	0	0	0	0
Turkmenistan	0	0	10	0	0	8	0	5	1	24
Uzbekistan	0	0	21	0	0	12	0	7	5	45
Viet Nam	6	26	31	0	0	5	1	25	3	97

2.3 Europe and the Caucasus	Local			Regional			International			Total
Country	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Netherlands Antilles	0	0	0	0	0	0	0	1	2	3
Norway	33	13	3	1	1	1	1	21	3	77
Svalbard and Jan Mayen Islands	0	0	0	0	0	0	0	0	0	0
Poland	72	35	16	4	13	1	2	44	2	189
Portugal	9	36	1	1	1	0	0	8	0	56
Azores Islands	0	0	0	0	0	1	0	0	0	1
Madeira Islands	0	0	0	0	0	0	0	0	0	0
Republic of Moldova	0	0	17	0	2	2	0	16	8	45
Romania	0	0	94	5	5	9	0	29	12	154
Russian Federation	0	0	178	5	5	21	3	37	24	273
San Marino	0	0	0	0	0	0	0	0	0	0
Serbia	16	1	15	4	5	2	1	42	5	91
Slovakia	18	4	5	8	21	1	4	47	11	119
Slovenia	17	8	35 (1)	5	21	3	1	48	22	160
Spain	68	88	66	1	2	0	0	19	1	245
Sweden	31	12	6	2	3	2	2	31	5	94
Switzerland	6 (2)	17	4	2	8	0	0	10	0	47
The Former Yugoslav Republic of Macedonia	0	0	7	0	1	1	0	10	0	19
Turkey	11	18	59	1	0	3	1	15	4	112
Ukraine	20	31	68	5	12	4	4	55	12	211
United Kingdom	46 (11)	28 (4)	207 (72)	28	19	30	10	131	71	570
Anguilla	0	0	0	0	0	0	0	0	2	2
Bermuda	0	0	2	0	0	1	0	1	1	5
British Indian Ocean Territory	0	0	0	0	0	0	0	0	0	0
British Virgin Islands	0	0	0	0	0	0	0	0	1	1
Cayman Islands	0	0	0	0	0	0	0	0	0	0
Falkland Islands (Malvinas) ¹⁰	0	0	3	0	0	0	0	1	0	4
Gibraltar	0	0	0	0	0	0	0	0	0	0
Montserrat	0	0	0	0	0	0	0	0	2	2
Pitcairn Islands	0	0	0	0	0	0	0	0	0	0
Saint Helena, Ascension and Tristan da Cunha	0	0	0	0	0	0	0	0	0	0
Turks and Caicos Islands	0	0	0	0	0	0	0	0	0	0

¹⁰ A dispute exists between the Governments of Argentina and the United Kingdom of Great Britain and Northern Ireland concerning sovereignty over the Falkland Islands (Malvinas). (Editorial directive ST/CS/SER.A/42, United Nations Secretariat, 3 August 1999)

2.5 Near and Middle East										
Country	Local			Regional			International			Total
	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Saudi Arabia	0	0	9	0	0	2	0	1	2	14
Sudan	0	0	56 (1)	0	0	0	1	3	9	69
Syrian Arab Republic	0	0	8	0	0	1	1	5	4	19
United Arab Emirates	0	0	0	0	0	0	0	0	0	0
Yemen	0	0	33	0	0	1	0	2	1	37

2.6 North America										
Country	Local			Regional			International			Total
	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Canada	0	0	41	5	3	9	0	35	13	106
United States of America	14	6	64	5	3	8	8	106	59	273
American Samoa	0	0	0	0	0	0	0	0	0	0
Guam	0	0	5	0	0	0	0	3	0	8
Johnston Island	0	0	0	0	0	0	0	0	0	0
Midway Island	0	0	0	0	0	0	0	0	0	0
Northern Mariana Islands	0	0	1	0	0	0	0	11	1	13
Puerto Rico	0	0	0	0	0	0	0	0	2	2
United States Virgin Islands	0	0	0	0	0	0	0	1	1	2
Wake Island	0	0	0	0	0	0	0	0	0	0

2.7 Southwest Pacific										
Country	Local			Regional			International			Total
	at risk	not at risk	un-known	at risk	not at risk	un-known	at risk	not at risk	un-known	
Australia	6	2	118	0	1	3	9	146	65	350
Norfolk Island	0	0	0	0	0	0	0	0	0	0
Cook Islands	0	0	8	0	0	1	0	13	4	26
Fiji	0	0	12	0	0	1	0	14	1	28
Kiribati	0	0	2	0	0	0	0	6	2	10
Marshall Islands	0	0	0	0	0	0	0	0	0	0
Micronesia (Federated States of)	0	0	0	0	0	0	0	0	0	0
Nauru	0	0	0	0	0	0	0	0	0	0
New Zealand	0	0	17	0	1	2	0	8	6	34
Tokelau	0	0	0	0	0	0	0	0	0	0
Niue	0	0	2	0	0	0	0	0	0	2
Palau	0	0	0	0	0	0	0	9	3	12
Samoa	0	0	3	0	0	0	0	19	3	25
Solomon Islands	0	0	8	0	0	0	0	22	6	36
Tonga	0	0	3	0	0	0	0	13	2	18
Tuvalu	0	0	3	0	0	0	0	4	1	8
Vanuatu	0	0	6	0	0	0	0	4	1	11