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CONVENTION ON THE CONSERVATION OF EUROPEAN WILDLIFE
AND NATURAL HABITATS

**Progress report on the implementation of the Action Plan for the
Eradication of the Ruddy Duck in the Western Palaeartic, 2021-2025**

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Introduction

Ruddy Duck *Oxyura jamaicensis* is native to North America. Following escapes from captivity in the UK in the 1940s, a large population became established in the wild, and gradually expanded across parts of Europe, becoming one of the biggest threats to the globally endangered White-headed Duck *Oxyura leucocephala*, through hybridisation and competition (Green & Hughes 1996).

In the 1990s, the Council of Europe commissioned a review and an action plan for the eradication of the Ruddy Duck, under the Bern Convention (Hughes *et al* 1999). This plan has been revised at regular intervals.

Eradication targets and actions for Contracting Parties

The latest eradication plan, for the period 2021–25 (Cranswick & Hall 2019), sets out a series of outcomes, with targets and actions for Contracting Parties, according to different Tiers:

- Tier 3 – Contracting Parties with breeding and/or significant numbers of Ruddy Ducks (Belgium, France, Germany, the Netherlands, the United Kingdom)
- Tier 2 – Contracting Parties at significant risk of Ruddy Ducks arriving from Tier 3 countries (Austria, Czech Republic, Denmark, Hungary, Ireland, Italy, Luxembourg, Norway, Poland, Spain, Slovakia, Sweden, Switzerland)
- Tier 1 – all other Contracting Parties in the Western Palearctic

Concerning Ruddy Ducks in the wild –

Outcome:

- The Ruddy Duck is functionally extinct in the wild in the western Palearctic by 2025

Targets:

- Tier 3 countries: undertake active control to reduce the Contracting Party's Ruddy Duck population to be functionally extinct by 2025
- Tier 2 countries: undertake rapid reactive control to eliminate any Ruddy Duck in the Contracting Parties' territory

Actions for all Contracting Parties:

- Monitor the status and distribution of Ruddy Ducks in the wild annually
- Provide sufficient resources to effectively monitor numbers of Ruddy Ducks in the wild
- Provide sufficient resources to meet national control targets
- Rapidly identify and resolve any problems that delay or undermine national control measures (*eg* site access, public perception)

Concerning Ruddy Ducks in captivity –

Outcome:

- The risk of accidental introductions of Ruddy Ducks in the Western Palearctic is understood and minimized

Targets:

- The numbers of Ruddy Ducks in captivity is understood by 2022
- The risks of accidental introduction are assessed by 2024
- No new introductions of Ruddy Ducks occur

Actions:

- Prevent the importing, selling and breeding of captive Ruddy Ducks
- Identify the number of individual birds, and the keepers of all Ruddy Ducks
- Assess the risk of release (*eg* from poor biosecurity)
- Identify and implement mitigation for major risks of release (*eg* establish secure facilities to which keepers could give their birds)

Concerning adaptive management and international co-ordination –

Outcomes:

- Progress towards achieving the plan's outcomes and targets is regularly assessed and adaptively managed
- Contracting Parties coordinate their activities to collectively achieve the plan's outcomes and targets in a timely and cost-effective manner
- The plan is updated in 2025

Actions for all Contracting Parties:

- Report annually to the Convention –
 - Regarding wild Ruddy Ducks: the status of non-breeding and breeding wild Ruddy Ducks; progress towards and the likelihood of achieving national control targets; problems encountered to achieving control targets and the solutions identified to address these
 - Regarding captive Ruddy Ducks: the status of Ruddy Ducks in captivity; an assessment of risk of new introductions

Actions for Tier 3 Contracting parties:

- Experts (from all Tier 3 Contracting Parties as a minimum) meet to review progress against control targets, identify impediments to control, agree solutions, and report to the Convention annually

Assessing progress

To assess progress against the 2021–25 eradication plan, a questionnaire was sent to all Contracting Parties in early summer 2021. This comprised 12 multiple-choice questions regarding progress, and requested data on numbers of birds in the wild, in captivity, and how many had been controlled.

Responses were received from 19 parties. These were mainly completed questionnaires, though a few were only partially completed and some responses were emails saying that no Ruddy Ducks had been sighted in the country for some time.

A meeting was held of Tier 3 countries in July 2021, attended by technical experts from Belgium, France, Germany, the Netherlands and the UK, to consider progress and issues in more detail in these key countries.

Status of Ruddy Duck in Europe

Numbers of Ruddy Ducks in the wild, in captivity, and the numbers controlled since the last eradication plan period, as provided by 19 Contracting Parties, are given in Tables 1 to 4.

Table 1. Numbers of non-breeding Ruddy Ducks in Contracting Parties, 2019 to 2021

Numbers are given as 'x, y, (z)', where x = number of birds, y = number of sites at which birds were found, and z = quality of estimate. '?' = reported by respondent as 'unknown'; '-' = no answer provided. Quality of estimate: 1 = coverage of sites largely complete and representative; 2 = partial coverage of sites only; 3 = expert guess. 'Winter' = 1 September to 31 March; 'summer' = 1 April to 31 August. Data for summer 2021 are partial results, as responses were requested midway through the period. Responses indicating no birds found are shaded grey.

Country	2019/20	2020	2020/21	2021
	Winter	Summer	Winter	Summer
Tier 3				
Belgium	8, 6 (2)	8, 6 (2)	5, 2 (2)	6, 5 (2)
France ⁽¹⁾	-, - (-)	-, - (-)	-, - (-)	-, - (-)
Netherlands	≥100-120, ≥15 (3)	≥80, ≥30 (3)	≥100-120, ≥15 (3)	≥75, ≥28 (3)
Germany	13, 11 (2)	9, 9 (2)	12, 10 (2)	5, 4 (2)
UK	12, 12 (2)	12, 12 (3)	14, 8 (2)	14, 14 (3)
Tier 2				
Czech Republic	1, 1 (1)	1, 1 (1)	1, 1 (1)	0, 0 (1)
Denmark	0, 0 (3)	0, 0 (3)	0, 0 (3)	0, 0 (3)
Hungary	1, 1 (1)	0, 0 (1)	0, 0 (1)	1, 1 (1)
Norway	0, 0 (-)	0, 0 (-)	0, 0 (-)	0, 0 (-)
Poland	0, 0 (1)	1, 1 (1)	4, 3 (1)	0, 0 (1)
Spain	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)
Switzerland	0, 0 (1)	0, 0 (1)	4, 3 (1)	1, 1 (1)
Tier 3				
Croatia	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)
Greece	?, ? (3)	?, ? (3)	?, ? (3)	?, ? (3)
Iceland ⁽²⁾	0, 0 (1)	1, 1 (1)	1, 1 (1)	2, 2 (1)
Liechtenstein	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)
Malta ⁽³⁾	0, - (-)	0, - (-)	0, - (-)	0, - (-)
Portugal	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)
Slovenia	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)
Turkey	0, 0 (1)	0, 0 (1)	0, 0 (1)	0, 0 (1)

Notes

1. No questionnaire response was received for France. At the adaptive management meeting in July 2021, the presentation by France showed that total numbers were considered to be fewer than 20 in 2021, and that surveys are considered to provide an accurate assessment.
2. It is more likely that Ruddy Ducks occurring in Iceland in recent years are vagrants from North America than from the naturalised population in Europe.
3. Malta provided a response via email about numbers, but did not complete the questionnaire.

Table 2. Numbers of breeding Ruddy Ducks in Contracting Parties, 2020 and 2021

Numbers are given as 'x, y, (z)', where x = pairs of birds, y = number of sites at which birds were found, and z = quality of estimate. '?' = reported by respondent as 'unknown'; '-' = no answer provided. Quality of estimate: 1 = coverage of sites largely complete and representative; 2 = partial coverage of sites only; 3 = expert guess. Responses indicating no birds found are shaded grey.

Country	2020	2021
Tier 3		
Belgium	0, 0 (2)	0, 0 (2)
France ⁽¹⁾	-, - (-)	-, - (-)
Germany	1, 1 (2)	0 (0, 2)
Netherlands	≥20, ≥13 (3)	≥22, ≥15 (3)
UK	2, 2 (2)	0, 0 (2)
Tier 2		
Czech Republic	2, 2 (1)	2, 2 (1)
Denmark	0, 0 (3)	0, 0 (3)
Hungary	0, 0 (1)	0, 0 (1)
Norway	0, 0 (1)	0, 0 (1)
Poland	0, 0 (1)	0, 0 (1)
Spain	0, 0 (1)	0, 0 (1)
Switzerland	-, - (-)	-, - (-)
Tier 1		
Croatia	0, 0 (1)	0, 0 (1)
Greece	?, ? (3)	?, ? (3)
Iceland	0, 0 (1)	0, 0 (1)
Liechtenstein	0, 0 (1)	0, 0 (1)
Malta	0, - (-)	0, - (-)
Portugal	0, 0 (1)	0, 0 (1)
Slovenia	0, 0 (1)	0, 0 (1)
Turkey	0, 0 (1)	0, 0 (1)

Notes

1. No questionnaire response was received for France. At the adaptive management meeting in July 2021, the presentation by France showed that only a few pairs have attempted to breed in recent years, and that there is reasonable survey coverage.

Table 3. Numbers of Ruddy Ducks controlled in Contracting Parties, 2019 to 2021

Numbers are given as 'x, y', where x = numbers of birds controlled, and y = number of sites at which birds were controlled. '?' = reported by respondent as 'unknown'; '-' = no answer provided. The reporting periods run from 1 September to 31 August.

Country	2019/20	2020/21
Tier 3		
Belgium	2, 2	1, 1
France ⁽¹⁾	-, -	-, -
Germany	1, 1	0, 0
Netherlands	33, 7	19, 4
UK	1	0
Tier 2		
Czech Republic	?, ?	?, ?
Denmark	6, 2	9, 4
Hungary	0, 0	0, 0
Norway	0, 0	0, 0
Poland	0, 0	0, 0
Spain	0, 0	0, 0
Switzerland	0, 0	?, ?
Tier 1		
Croatia	0, 0	0, 0
Greece	?, ?	?, ?
Iceland	0, 0	0, 0
Liechtenstein	0, 0	0, 0
Portugal	0, 0	0, 0
Slovenia	0, 0	0, 0
Turkey	-, -	-, -

Notes

1. No questionnaire response was received for France. At the adaptive management meeting in July 2021, the presentation by France indicated that large numbers had been controlled in recent years, reducing the population from around 200 to fewer than 20 birds.

No country reported that control of nests was undertaken.

Table 4. Numbers of Ruddy Ducks in captivity Contracting Parties, 2020 and 2021

Numbers are given as 'x, y, (z)', where x = number of birds, y = number of collections with birds, and z = quality of estimate. '?' = reported by respondent as 'unknown'; '-' = no answer provided. Quality of estimate: 1 = coverage of sites largely complete and representative; 2 = partial coverage of sites only; 3 = expert guess. Responses indicating no birds in captivity are shaded grey.

Country	2020	2021
Tier 3		
Belgium	?, ? (3)	35, 7 (2)
France	-, - (-)	-, - (-)
Germany	14 (3, 2)	9 (3, 2)
Netherlands	?, ? (-)	?, ? (-)
UK	50, 20 (3)	50, 20 (3)
Tier 2		
Czech Republic	4, ? (2)	4, ? (2)
Denmark	?, ? (3)	?, ? (3)
Hungary	0, 0 (1)	0, 0 (1)
Norway	0, 0 (1)	0, 0 (1)
Poland	0, 0 (3)	0, 0 (3)
Spain	0, 0 (2)	0, 0 (2)
Switzerland	-, - (-)	-, - (-)
Tier 1		
Croatia	0, 0 (1)	0, 0 (1)
Greece	?, ? (-)	?, ? (-)
Iceland	0, 0 (-)	0, 0 (-)
Liechtenstein	0, 0 (1)	0, 0 (1)
Portugal	0, 0 (1)	0, 0 (1)
Slovenia	0, 0 (3)	0, 0 (3)
Turkey	0, 0 (1)	0, 0 (1)

Progress against targets and actions

Progress against targets and actions in the 2021–25 eradication plan, as provided by 19 Contracting Parties, are given in Tables 5 to 7.

Table 5. Progress against eradication targets and actions by Tier 3 Contracting Parties

Questions and answers below have been summarised slightly from the questionnaire for simplicity; see the Appendix for the full questions and possible answers. An empty cell indicates that no answer was provided. Question 2 was specifically for Contracting Parties in Tier 2.

	Belgium	France ⁽¹⁾	Germany	Netherlands	UK
Ruddy Ducks in the wild					
Q1 Will Ruddy Ducks be functionally extinct in your country by 2025?	yes		no	yes	yes
Q3 Are non-breeding Ruddy Ducks monitored in the wild?	largely		partly	partly	completely
Q4 Do surveys provide an accurate assessment of non-breeding birds?	largely		largely	largely	largely
Q5 Are breeding birds monitored in the wild?	no		largely	partly	largely
Q6 Do surveys provide an accurate assessment of breeding birds?	no		largely	partly	largely
Ruddy Ducks in captivity					
Q7 Are numbers of Ruddy Ducks in captivity and keepers known?	partly		no	no	partly
Q8 When will numbers of captive birds and keepers be known?	2021-22		after 2025	after 2025	after 2025
Q9 What is the risk that a bird could escape from captivity?	some risk		unknown	unknown	low
Q10 How confident are you that you understand risk of escape accurately?	reasonably		not known	not known	reasonably
Q11 When will you be able to assess risk of escape reasonably accurately?	2024		after 2026	after 2026	after 2026
Q12 Have any Ruddy Ducks escaped from captivity in the last 18 months?	no		no	no	no

Notes

1. No questionnaire response was received for France. At the adaptive management meeting in July 2021, the presentation from France showed that functional extinction locally will likely be achieved by 2025, that non-breeding and breeding birds are monitored, and that surveys are considered provide an accurate assessment.

Table 6. Progress against eradication targets and actions by Tier 2 Contracting Parties

Questions and answers below have been summarised slightly from the questionnaire for simplicity; see the Appendix for the full questions and possible answers. An empty cell indicates that no answer was provided. 'n/a' indicates that the Contracting Party considered the question was not applicable, given no birds are held in captivity. Question 1 was specifically for Contracting Parties in Tier 3.

	Czech Rep	Denmark	Hungary	Norway	Poland	Spain	Switzerland
Ruddy Ducks in the wild							
Q2 Were individual birds eliminated rapidly?	none seen	none seen ⁽¹⁾		none seen	none seen	none seen	no ⁽²⁾
Q3 Are non-breeding Ruddy Ducks monitored?	partly	largely	completely	completely	partly	completely	completely
Q4 Do surveys provide an accurate assessment?	largely	largely	completely	completely	largely	completely	completely
Q5 Are breeding birds monitored in the wild?	largely	largely	completely	completely	no	completely	completely
Q6 Do surveys provide an accurate assessment?	largely	largely	completely	completely	no	completely	completely
Ruddy Ducks in captivity							
Q7 Are numbers in captivity and keepers known?	partly	no	largely	partly	partly	partly	no
Q8 When will numbers in captivity be known?	2023-24	after 2025	2021-22	after 2025	2021-22	2021-22	
Q9 What is the risk that a bird could escape?	unknown	unknown	n/a	n/a	n/a	n/a	some
Q10 How well is the risk of escape understood?	reasonably	not known	n/a	n/a	n/a	best guess	best guess
Q11 When will you be able to assess risk of escape?	2024	after 2026	n/a	n/a	n/a	n/a	
Q12 Have any birds escaped in the last 18 months?	no	no	n/a	n/a	n/a	n/a	yes ⁽³⁾

Notes

1. Although Denmark reported, in response to 'were birds eliminated rapidly', that 'no birds recorded in the last 12 months', the questionnaire reported six and nine birds controlled in 2020 and 2021, respectively.
2. Although this question was left blank in the Switzerland response, additional notes provided presumed that birds were not rapidly controlled.
3. At least three different banded individuals were seen in Switzerland – at Lake Neuchatel (male), and Bielersee (female), and on the River Rhine close to Basel (considered likely to be a South-American subspecies). Additionally, a pair was seen at Morschach in February 2021, though rings were not seen.

Table 7. Progress against eradication targets and actions by Tier 1 Contracting Parties

Questions and answers below have been summarised slightly from the questionnaire for simplicity; see the Appendix for the full questions and possible answers. An empty cell indicates that no answer was provided. 'n/a' indicates that the Contracting Party considered the question was not applicable, given no birds are held in captivity. Tier 1 Contracting Parties were not required to answer Questions 1 or 2.

	Croatia	Greece	Iceland	Lichtenstein	Portugal	Slovenia	Turkey
Ruddy Ducks in the wild							
Q3 Are non-breeding Ruddy Ducks monitored?	completely	no	no	completely	completely	completely	largely
Q4 Do surveys provide an accurate assessment?	completely	no		completely	completely	completely	
Q5 Are breeding birds monitored in the wild?	completely	no	no	completely	completely	completely	
Q6 Do surveys provide an accurate assessment?	completely	partly		completely	completely	completely	
Ruddy Ducks in captivity							
Q7 Are numbers in captivity and keepers known?	largely	no	largely	largely	largely	largely	largely
Q8 When will numbers in captivity be known?		after 2025			2021-22	2021-22	
Q9 What is the risk that a bird could escape?	n/a	unknown		n/a	n/a	n/a	
Q10 How well is the risk of escape understood?	n/a	reasonably		n/a	n/a	n/a	
Q11 When will you be able to assess risk of escape?	n/a	n/a		n/a	n/a	n/a	
Q12 Have any birds escaped in the last 18 months?	n/a	n/a		n/a	n/a	n/a	

Progress against targets and actions in Tier 3 countries was assessed in more detail by technical experts from Belgium, France, Germany, the Netherlands and the UK at a meeting on 21 July 2021. The key points were noted as follows:

Belgium – all Ruddy Ducks recorded in recent years have been found in Flanders; none has been seen in Wallonia. Numbers are very small – in summer 2020, there was a maximum of eight birds across six locations; in winter 2020-21, a maximum of five birds from two locations. No breeding was recorded in 2020 or 2021. Although there is no direct evidence, the birds occurring in Belgium are believed to derive from the population in the Netherlands and/or France.

All birds sighted are targeted for control. Citizen science helps provide records, and there is a rapid response from marksmen. Control measures have been in place since the late 2000s, since when 86 birds have been controlled, including two each in 2019 and 2020. The rapid response programme is well resourced and will be maintained. It is, however, considered that control in Belgium alone will make little impact on numbers in the country, as birds are probably coming in from neighbouring countries.

France – an EU LIFE project is underway to eradicate Ruddy Ducks and has made significant progress in the last few years, reducing the national population from around 200 to fewer than 20 birds. Considerably improved control efforts include systematic searching of potential breeding sites, targeting sightings even of single birds, and quicker reactivity (within 1–2 days) following sightings. Lower breeding productivity may also be a contributory factor to the reduction in numbers. It is thought that just a few pairs attempted to breed in the most recent years, and nest trapping has also been used for control. Most birds are found around the former stronghold in the northwest, though some isolated birds are observed in the east.

It is thought likely that functional extinction will be achieved within the project or shortly afterwards. The LIFE project will end in two years. It is believed that control will continue, funded nationally, and that it will be possible to arrange for this to be sufficient for the size of the population at that point.

The captive population is thought to be around 200 birds. In association with the main breeding association, breeders are being encouraged to transfer their birds to secure zoos.

The Netherlands – there are around 100 Ruddy Ducks, possibly more, quite widely spread across the east and centre of the country. There are around 30 breeding pairs.

Control has been delegated to the provinces, and an interprovincial working group has been established to consider a cross-border approach and many measures are in place. Control is undertaken by specialised hunters. However, just 15–33 birds have been controlled annually over the last five years, and although there was a slight decline in Ruddy Duck numbers in Flanders in the last year, control is clearly insufficiently effective to bring about the required reduction to achieve eradication. Implementation of control is hampered by many of the known issues encountered in other countries (detection of birds, technical challenges of shooting birds on large waterbodies), and also by legal and policy issues, such as lack of access to key sites and restrictions on shooting due to public safety concerns and perceived public reaction. Consequently, the national population has remained broadly stable over a long period.

Germany – there are 5–10 sightings annually, and the impression is that numbers are declining, perhaps due to eradication elsewhere or fewer in captivity. There are two key sites: one in the north has held a pair for several years, and breeding occurred in 2020 (the ducklings disappeared); another site, close to the Dutch border, has held up to three birds in winter, though none was seen in 2020-21. There have been only two known breeding attempts – the 2020 record, and another in the 1990s (no birds occur at that site now).

There is a reporting system in place, following the EU IAS Regulation, but there have been few reports, and there is a reluctance by birdwatchers to report Ruddy Ducks. There may also be an awareness issue among birdwatchers. There is control effort, but it is quite limited. It is thought that some birds are escapes from captivity. Some states have information on numbers in captivity, others do not. Numbers in captivity are thought to have decreased since the IAS Regulation came into force.

United Kingdom – recorded numbers have been very small for several years. There are around 20 birds or fewer, recorded across 12 to 14 sites in the last two years. Most are widely separated, with just single or at most two or three birds in any one region. Consequently, breeding is now a rare event (none in 2019, and perhaps two pairs in 2020), such that the species is close to being functionally extinct.

Monitoring is undertaken, along with careful checking of different sources of sightings, which are actively followed up by a very experienced control team. Few birds are controlled, given the small population and the difficulty of locating birds, but there is confidence that the population is not growing, and that further losses will also occur through old age. Control measures will continue to be maintained.

The participants considered that positive progress had been made in most countries, but was insufficient in the Netherlands. Although the problems there are real and challenging, they are common to other countries and have been overcome.

It was felt that the Netherlands did not lack relevant resources (it has extensive and successful control programmes for other invasive species), and that there was no need for a LIFE project to achieve eradication (indeed, that a new LIFE project would cause delays in meeting the target). It was felt that for control to be effectively implemented required policy solutions.

The participants considered the situation in the Netherlands to be pressing and urgent, as it undermines the chances of the international eradication plan meeting its target, and potentially compromises the considerable gains made as a result of two LIFE projects, in the UK and France.

Conclusions and future needs

A reasonable level of response was received to the questionnaire. Of Tier 3 countries, only France had not responded by the time of this report, but a detailed update of the situation in France was provided at the meeting of experts in July. Responses had not been received from Germany for previous assessments, so the response received for this review and participation in the meeting of experts are positive developments. A reasonable level of responses was received for Tier 2 countries. Consequently, the update provided in this report is believed to be a representative picture of progress and of the significant issues with eradication.

There were a small number of apparent discrepancies in some responses to the questionnaire and some questions were not answered, seemingly based on misunderstandings. None is thought to be significant, however, and the picture painted here is believed to be representative. The questionnaire will be honed for the 2022 update, and more time will be allowed in the annual review schedule to chase responses and to seek clarification over apparent discrepancies.

There is an obviously improved picture regarding eradication overall. Most notable is the very large reduction in numbers in France since the end of the last plan period (2016–2020), from around 100 birds and 30 breeding pairs to fewer than 20 birds and just a few breeding attempts in 2021. Consequently, it appears that populations in Belgium, France and the UK are already close to being functionally extinct, and, with continued control efforts, the 2025 target appears achievable in these countries.

A number of issues are noteworthy and of concern –

The most significant concern is the situation in the Netherlands. There are more than 100 non-breeding birds, and more than 20 breeding pairs. (Further, there is some uncertainty over the accuracy of these figures.) This represents the great majority of the naturalised population in Europe, more than double the combined total of numbers in all other countries.

Of greater concern is the efficacy of control efforts. Whilst the majority of practical measures are in place, comparatively very few birds are controlled (just 33 in 2019/20 and just 19 in 2020/21 at the time of reporting). Evidence from control in the UK and France shows that a significant reduction in numbers occurs when the numbers controlled are around twice the total counted in winter.

The meeting of experts concluded that there were no technical or financial barriers to control in the Netherlands. Rather, greater political will was needed, *eg* to overcome issues around shooting at sites used by the public. These issues have been overcome in other countries with effective control programmes.

Whilst the questionnaire response from the Netherlands indicated that functional eradication will be achieved by 2025, there is little reason to consider that this is realistic. The current situation has remained little changed in the Netherlands for around a decade.

The population in the Netherlands is by far the most significant risk for a continued population of Ruddy Ducks in the wild in Europe, and therefore also that the targets of the action plan will not be met, and means that active control measures will continue to be required in other countries (see below).

Renewed energy at the national policy level is required in the Netherlands to ensure that the control measures put in place bring about a reduction in numbers, and concerted and continued effort will be required to achieve eradication. Realising the goal of the international eradication plan is now largely dependent on this need, and will not be achieved without it.

More than 10 birds were recorded in both winters in Germany, with corresponding numbers during summer (reported numbers at this time are inevitably smaller due to detectability). This strongly

suggests a local population (and breeding was reported in 2019). The situation in Germany thus appears similar to that in Belgium, France and the UK.

It is notable, however, that the effectiveness of control measures Germany are low, with just one bird controlled at one site in the two years. This level of control is well below that needed for eradication, and this is acknowledged in Germany's questionnaire response, which says that functional extinction will not be achieved by 2025.

A marked increase in the effectiveness of control is needed in Germany. It is unclear what control measures are in place (this information was requested in previous reviews, but replies were not received from Germany at that time). This information should be clarified as a matter of some urgency, to ensure issues around control in Germany are understood and that an effective eradication programme can be delivered.

Ruddy Ducks were recorded in five of the seven Tier 2 Contracting Parties that responded (Czech Republic, Denmark, Hungary, Poland and Switzerland). Whilst numbers were very small, it is notable that Ruddy Ducks continue to be recorded regularly across a wide area, despite the reduction in the total population overall. The obvious concern is that birds from the population in the Netherlands, and perhaps also Germany, continue to wander. Given that breeding Ruddy Ducks are often elusive, high vigilance across Tier 2 countries, coupled with active control, remain priorities.

Given these occurrences, a priority for future reviews is to have responses from other Tier 2 Contracting Parties to ensure a full picture.

Information on the age of controlled birds is useful, as it indicates whether breeding has occurred. Data on the sex and age of controlled birds was not provided by some Contracting Parties. This information should be provided in future reviews to enable a fuller assessment of the risk, particularly in Tier 2 countries.

Numbers in captivity reported here are much lower than estimates provided in previous reviews, though it is recognised that gathering better information on numbers in captivity is a work in progress for many Contracting Parties. Escapes from captivity, as noted in Switzerland, are an obvious concern, and demonstrate that birds in captivity remain a risk. There is clearly a need for better information on birds in captivity and assessing the risk of escape; and, obviously, there are corresponding needs to ensure that measures are in place to reduce that escape risk, and to control any birds which escape. These needs will remain after functional extinction has been achieved.

Acknowledgements

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References

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Appendix

Questions and answers used in the questionnaire to assess progress with the eradication plan, 2021

For Tier 3 Contracting Parties only –

Q1. Will Ruddy Ducks be functionally extinct in your country by 2025?

- Yes - we are confident they will be
- No - it is unlikely

For Tier 2 Contracting Parties only –

Q2. Were individual birds eliminated rapidly?

- Yes - all/most birds were eliminated in <2 weeks
- All/most birds were eliminated eventually
- At least one third of birds were not controlled
- No birds were recorded in the last 12 months

For all Contracting Parties –

Q3. Are the status and distribution of non-breeding Ruddy Ducks monitored in the wild in your country? (surveys at any time of year to assess numbers present)

- Completely
- Largely
- Partly
- No

Q4. Do the surveys provide an accurate assessment of non-breeding Ruddy Duck numbers and status in your country?

- Completely
- Largely
- Partly
- No

Q5. Are the status and distribution of breeding Ruddy Ducks monitored in the wild in your country? (surveys specifically to record breeding occurrence and assess numbers of breeding pairs)

- Completely
- Largely
- Partly
- No

Q6. Do the surveys provide an accurate assessment of breeding Ruddy Duck numbers and status in your country?

- Completely
- Largely
- Partly
- No

Q7. Is the number of captive Ruddy Ducks and keepers in your country known?

- Yes - largely or completely
- Partly
- Only poorly or not at all

Q8. When will the numbers of captive birds and keepers be accurately known?

- 2021 or 2022
- 2023 or 2024
- 2025 or after

Q9. What is the risk that a bird could escape from captivity?

- There is some risk
- The risk is low
- The risk is highly unlikely
- The risk is unknown
- No Ruddy Ducks held in captivity

Q10. How confident are you that you understand the risk of escape accurately?

- The risk is reasonably well understood
- The risk is an estimate / best guess
- It is not possible to assess the risk accurately
- No Ruddy Ducks held in captivity

Q11. When will you be able to assess the risk of escape reasonably accurately?

- 2024 or before
- 2025 or 2026
- 2027 or after
- No Ruddy Ducks held in captivity

Q12. Do you know of or suspect any Ruddy Ducks to have escaped from captivity in the last 18 months?

- Yes
- No
- No Ruddy Ducks held in captivity