

SEASONAL DYNAMICS AND WINTER OCCURRENCE OF NON-NATIVE SPECIES – MANDARIN DUCK (*AIX GALERICULATA*) IN THE CZECH REPUBLIC

Vladimír Mikule¹

¹ Department of Animal Breeding, Faculty of AgriSciences, Mendel University in Brno, Zemědělská 1, 613 00 Brno, Czech Republic

Link to this article: <https://doi.org/10.11118/actaun202068020323>

Received: 8. 3. 2020, Accepted: 2. 4. 2020

To cite this article: MIKULE VLADIMÍR. 2020. Seasonal Dynamics and Winter Occurrence of Non-native Species – Mandarin Duck (*Aix galericulata*) in the Czech Republic. *Acta Universitatis Agriculturae et Silviculturae Mendelianae Brunensis*, 68(2): 323–328.

Abstract

The study aims to evaluate changes in occurrence of the Mandarin Duck, *Aix galericulata* (Linnaeus, 1758) in the Czech Republic in 2008–2019 with focus on winter months (December, January and February) 2007/08–2018/19. Seasonal dynamics of occurrence was evaluated for years 2008–2019 by comparison of 3831 observations. The highest number of observations comes from winter period (36.7%), if we exclude data from South Moravian Region (with whole year occurrence), it is 48%. In winters 2007/08–2018/19 occurrence of 772 birds was detected, most of them with determined gender – 469 males (63.4%) and 271 females (36.6%). In winter periods 2007/08–2010/11 the occurrence was concentrated in the Central Bohemian Region (Vltava river). Since the winter 2011/12 the centre of occurrence was in the South Moravian Region which is related with a formation of stable breeding population in that region. Pattern of the highest number of observations in a winter period lasts but the highest numbers of observed birds are possibly of the Czech origin.

Keywords: non-native species, wintering, distribution, season

INTRODUCTION

Problems of non-native species and their spreading is an actual topic on a Czech and European level. Monitoring of their distribution is an important for evaluation of possible risk which can these species mean for native fauna and flora (AOPK, 2020). Mandarin Duck, *Aix galericulata* (Linnaeus, 1758) is a non-native avian species in the Czech Republic often bred as an ornamental bird in hobby breeding, parks and zoological gardens. It originates from Far East of Russia, China, Korean Peninsula, Japan and Taiwan and was introduced into Europe (Great Britain) before 1745. Actual free-living population was established in twentieth century and grew from 250 pairs in begin of seventieth into 7 000 individuals in 1990 (Lever, 2013). The same number is estimated for period 2004–2007 (Banks *et al.*, 2008).

Breeding populations were established in other European countries too. Banks *et al.* (2008) mention estimated numbers of breeding pairs in a period 2004–2007: Germany (350 pairs), The Netherlands (200–260 pairs), Belgium (more than 100 pairs), Austria (40–60 pairs), Poland (up to 20 pairs), France (18 pairs), Switzerland (up to 10 pairs), Monaco (2 pairs). According to UNEP-WCMC (2015) breeding was confirmed in Norway (1 pair; 2014) and the first breeding was proved in Slovakia (1 pair; Birding Slovakia, 2018).

Mandarin Duck was found in the Czech Republic as an escape from breeding in the past, actually (especially after 2008) there can be find birds from free-living populations from neighbouring countries and birds from Czech breeding population (Šťastný and Hudec, 2016). Mandarin Duck was for the first time recorded in the wild in

the area of today's Czech Republic in the second half of 19th century. This specimen – a drake in a breeding plumage originated from the region of Hodonín, South Moravia (Kněžourek, 1910–1912; H. M. Berg in verb). The first breeding in the area of today's Czech Republic was confirmed in 1980, when Hájek (1994) observed 4 juveniles 1. 8. 1980 at Lednice, South Moravia. The second breeding was recorded in 2008 on the Velička river, district of Hodonín, South Moravia (B. Jagoš in verb). Since 2009, Mandarin Ducks have been residents on the Svatka river in Brno, South Moravia, where breeding of 1 pair was confirmed in 2011. In following years the only breeding population was established there (with 5–9 breeding pairs) and an area of Brno town turned into the biggest wintering place for the species in the Czech Republic (Mikule, 2019). Mandarin Duck is a species which is actually spreading in the area of the Czech Republic and for evaluation of its possible influence on native fauna and flora it is necessary to monitor its distribution. The aim of the study was to evaluate seasonal dynamics and changes in numbers of wintering Mandarin Duck in the Czech Republic.

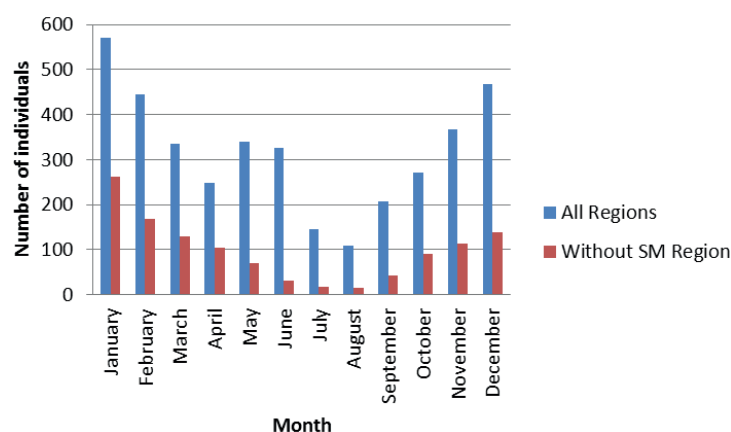
MATERIALS AND METHODS

Into the study of seasonal dynamics of occurrence data from 2008–2019 were taken. Into the study of winter occurrence of Mandarin Duck data from December–February 2007/08–2018/19 were put. Data were excerpted from Avif (ČSO, 2019), database of Czech Rarities Committee, database of Nature Conservation Agency of the Czech Republic and my own data from area of Brno were used. All data were individually assessed to eliminate duplication of observing. Each individual was included only once

per month for determination of seasonal dynamics of occurrence and once during the particular winter for determination of winter occurrence. Data collection from District Brno – Town, South Moravian Region was done by my own field observing (2011–2019). I am doing year-round monitoring of the locality (Svatka and Svitava rivers in Brno), for evaluation of wintering all unfrozen localities were controlled (on an average twice per month – together 75 controls). During controls birds were photographed to confirm the real number of individuals.

RESULTS AND DISCUSSION

Contrary to the past Mandarin Ducks are present in the Czech Republic year-round. Jasso (2009) mentions irregular occurrence before 1999, birds were observed only in some years. Since 2000 birds are observed annually. The highest portion of observation is from winter months (36.7%), if we exclude South Moravian Region (with ducklings during summer), it is 48%. Jasso (2009) mentions most of the observations in 1978–2008 came from winter (47%). In summer (June–August) he had only 4 birds (2.7%). His conclusion is that most of the wintering birds are from Western Europe. If there were escaped birds from breeding, the distribution should be similar year-round. Šťastný and Hudec (2016) mention in real winter months in 1915–2012 there were 46.7% of all observation. This trend of the highest number of observations in a winter period still lasts but now the highest numbers of observed birds are probably of the Czech origin (the number of birds on Svatka river in the end of breeding season and during winter is very similar, birds are doing just short distance transfers; Mikule, 2019).



1: Seasonal dynamics in occurrence of the Mandarin Duck in the Czech Republic, pooled data from 2008–2019

Duplication was eliminated only per one month (if the individual bird stayed in a locality for longer time than one month, it was counted once per month). The sum of 3831 observations was calculated to show the regularity of occurrence during the year. Because the South Moravian Region is different from the other regions (it has a permanent population). Figure shows two situations – all regions together and regions without South Moravia (in that case it is amount of 1185 observations).

In total there were observed 772 individuals in winters 2007/08–2018/19 including 469 males and 271 females. Mandarin Ducks were observed in the most of regions in the Czech Republic except Karlovy Vary Region. In winter seasons 2007/08–2010/11 in total 106 individuals were observed. The most important wintering place of the species was in Central Bohemian Region on Vltava river near village Klecánky, where the highest number of 17 birds was observed on 12 January 2008 (J. Nacházel, M. Nacházellová, ČSO 2019). In this period the highest number of 22 birds was observed in Central Bohemian Region in winter 2010/11. There was no confirmed nesting in Bohemia during that period, so the birds probably originated from populations in neighbouring countries (Germany).

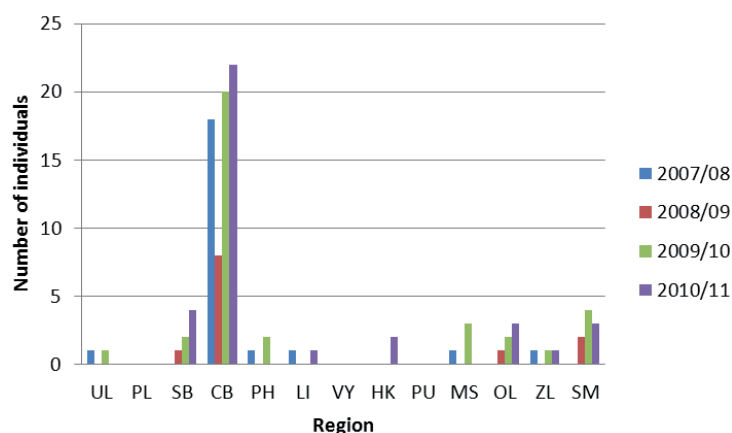
In winters 2011/12–2014/15 in total 192 individuals were observed. The first breeding population on Svratka river in Brno was established with the first breeding in 2011 (1 pair; 2012–2014 – 3 pairs every year). Mandarin Ducks successfully nested in National Park Podyjí – 1 pair in 2013 (Valášek, 2013), 2 pairs in 2014 and birds with South Moravian origin are staying near breeding locality year-round and wintering. Svratka river becomes the most important wintering place for the species in the Czech Republic. The highest number of 30 birds was observed in South Moravian Region in winter 2014/15. Number of Mandarin Ducks wintering in town Olomouc was increasing (from 2 individuals in 2011/12 to 11 birds in 2014/15).

In winters 2015/16–2018/19 in total 474 individuals were observed. The wintering place on Vltava river near Klecánky is abandoned (the last wintering pair is observed on 25 January 2016 – D. Matthey, I. Filipová, ČSO 2019). Population on Svratka river grows to 5–9 breeding pairs, at least one pair breeds since 2018 on Svitava river – in

2018 in Blansko district and in 2019 in Brno-venkov district (J. Koleček, ČSO 2019). The highest number of wintering individuals was observed again in South Moravian Region – 78 birds in winter 2016/17. In 2018 breeding of one pair of Mandarin Duck was confirmed in Olomouc (P. Blahník, ČSO, 2019).

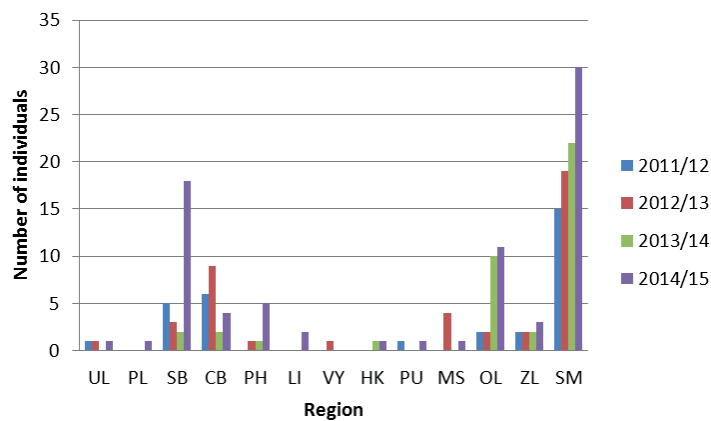
There were determined 469 males (63.4%) and 271 females (36.6%). In all season numbers of determined males oversized number of observed females, which could be result of not only higher number of males, but in some cases result of easier detectability of males in spectacular breeding plumage. Occurrence of Mandarin Duck in the Czech Republic in 1978–2008 studied Jasso (2009). He recorded 168 individuals and from that 136 with determined gender. There were 98 males (72%) and 38 females (28%). Number of determined females can be connected with growing population, but with better knowledge of the species too. In the past even skilled observer had a problem how to differentiate female of Mandarin Duck from female of Wood Duck, *Aix sponsa*. Now with good field guides and communication on online platforms identification became much easier.

Interesting results were brought by comparison of data for all winter season with results of International Waterbirds Census (IWC), which takes place annually around the middle of January. Mandarin Duck is surprisingly inconspicuous species which can be hardly detected in a habitat with hiding places. They like to rest in the bushes, under the river bank, on the trees. Shurtleff and Savage (1996) mention that by visual observing on well-known studied areas in Great Britain (small fishponds) it is possible to determine approximately 25% of real number of present Mandarin Ducks. By visual observing it is possible to detect only every tenth bird. Especially if the number of wintering

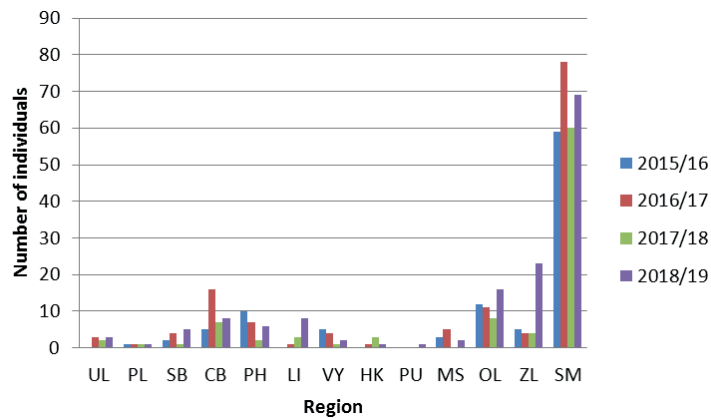


2: Number of wintering Mandarin Duck (*Aix galericulata*) in individual regions and winters 2007/08–2010/11

UL – Ústí nad Labem Region; PL – Plzeň Region; SB – South Bohemian Region; CB – Central Bohemian Region; PH – Prague Region; LI – Liberec Region; VY – Vysočina Region; HK – Hradec Králové Region; PU – Pardubice Region; MS – Moravian-Silesian Region; OL – Olomouc Region; ZL – Zlín Region; SM – South Moravian Region



3: Number of wintering Mandarin Duck (*Aix galericulata*) in individual regions and winters 2011/12–2014/15
For abbreviations of regions see Fig. 2



4: Number of wintering Mandarin Duck (*Aix galericulata*) in individual regions and winters 2015/16–2018/19
For abbreviations of regions see Fig. 2

I: Recorded number of Mandarin Ducks during winter seasons 2007/08–2018/19 (December–February) with recorded number of the species during International Waterbirds Census (in January 2008–2019) in the Czech Republic (according to Musilová et al., 2009, 2010, 2011, 2014a, b, 2016a, b, 2017a, b, 2019 and Monitoring vodních ptáků v ČR, 2020)

Season/Counting	Dec–Feb Total	Dec–Feb Male	Dec–Feb Female	IWC Total	IWC Male	IWC Female
2007/08 (resp. January 2008)	23	16	5	23	-	-
2008/09 (resp. January 2009)	12	7	3	22	-	-
2009/10 (resp. January 2010)	35	20	14	20	10	8
2010/11 (resp. January 2011)	36	27	9	13	9	4
2011/12 (resp. January 2012)	32	17	11	18	9	7
2012/13 (resp. January 2013)	42	23	19	36	21	13
2013/14 (resp. January 2014)	40	23	16	30	-	-
2014/15 (resp. January 2015)	78	51	27	46	21	15
2015/16 (resp. January 2016)	102	62	40	63	14	8
2016/17 (resp. January 2017)	135	66	39	57	33	23
2017/18 (resp. January 2018)	92	58	34	10	-	-
2018/19 (resp. January 2019)	145	99	44	91	58	30

Decr – Feb Counting – covers December, January, February – our study
IWC – International Waterbirds Census

birds is higher the real number can be assessed after longer observing. During IWC the observer controls long section of river and other water areas in one day. Some individuals of Mandarin Duck can be missed then (and not all unfrozen water areas

are included into IWC). In January 2018 in a frame of IWC a part of Svratka river in Brno which is the most important wintering place for the species was not controlled so the result for the whole Czech Republic was the sum of 10 counted birds.

CONCLUSION

Mandarin Duck is a non-native avian species in the Czech Republic often bred as an ornamental bird in hobby breeding, parks and zoological gardens. In the past years the species established small breeding population in the South Moravian Region originated from escaped birds and possibly from birds from neighbouring countries and the spreading of the species is visible. The aim of the study was to detect growth of numbers of wintering birds in the Czech Republic which can indicate spreading of the species in the future. In total, 772 birds were observed in winters 2007/08–2018/19, most of them with determined gender – 469 males (63.4%) and 271 females (36.6%). In a winter period 2007/08–2010/11 the occurrence was concentrated in the Central Bohemian Region (Vltava river). Since the winter 2011/12 the centre of occurrence was concentrated in South Moravian Region which is related with a formation of stable breeding population in that Region. Seasonal dynamic was evaluated by comparison of 3831 observations. The highest number of observations comes from winter period (36.7%), if we exclude data from South Moravian Region (with whole year occurrence), it is 48%. Pattern of the highest number of observations in a winter period lasts but the highest numbers of observed birds are possibly of the Czech origin. The centre of whole year occurrence is Svratka river in Brno, but we can record spreading of the species – since 2018 Svitava river, in 2019 Rokytná river on the border between South Moravian Region and Vysočina Region (possible breeding, ČSO 2020). Spreading will not be probably too fast but for an evaluation of possible impact on native fauna it is necessary to monitor actual distribution of this species.

REFERENCES

- AOPK. 2020. Invazní druhy. AOPK. [Online]. Available at: <http://invaznidruhy.nature.cz> [Accessed: 2020, February 20].
- BANKS, A. N., WRIGHT, L. J., MACLEAN, I. M. D. *et al.* 2008. Mandarin Duck. In: *Review of the status of introduced non-native waterbird species in the area of the African-Eurasian Waterbird Agreement: 2007 update*. British Trust for Ornithology Research Report No. 489, pp. 75–77.
- BIRDING SLOVAKIA. 2018. Zoznam pozorování vzácných a zriedkavých druhov. *Birding Slovakia*. [Online]. Available at: <http://birding.sk> [Accessed: 2018, August 20].
- ČSO. 2019. *Birds.cz – pozorování ptáků*. [Online]. Available at: <http://www.birds.cz/avif> [Accessed: 2019, June 30].
- HÁJEK, V. 1994. *40 let pozorování ptáků na jižní Moravě*. Unpublished manuscript dep. in ORNIS, Muzeum Komenského v Přerově.
- JASSO, L. 2009. Výskyt kachničky mandarinské (*Aix galericulata*) v České republice (1978–2008). *Sylvia*, 45: 115–119.
- KNĚŽOUREK, K. 1910–1912. *Velký přírodopis ptáků, I–II*. Praha: I. L. Kober.
- LEVER, C. 2013. *The Mandarin Duck*. Poyser Monographs. London: Bloomsbury Publishing.
- MIKULE, V. 2019. Hnízdění a zimování kachničky mandarinské (*Aix galericulata*) v České republice v letech 2008–2018 a charakteristika jediné etablované populace. *Sylvia*, 55: 103–116.
- MONITORING VODNÍCH PTÁKŮ V ČR. 2020. Mezinárodní sčítání vodních ptáků – leden 2018. *Monitoring vodních ptáků v ČR*. [Online]. Available at: <http://www.waterbirdmonitoring.cz/vysledky/iwc18/> [Accessed: 2020, February 20].
- MUSILOVÁ, Z., MUSIL, P., HAAS, M. *et al.* 2009. Mezinárodní sčítání vodních ptáků v České republice v lednu 2008 a 2009. *Aythya*, 2: 1–9.
- MUSILOVÁ, Z., MUSIL, P. and HAAS, M. 2010. Mezinárodní sčítání vodních ptáků v České republice v lednu 2010. *Aythya*, 3: 19–30.
- MUSILOVÁ, Z., MUSIL, P. and HAAS, M. 2011. Mezinárodní sčítání vodních ptáků v České republice v lednu 2011. *Aythya*, 4: 1–13.
- MUSILOVÁ, Z., MUSIL, P. and PROKEŠOVÁ, E. 2014a. Mezinárodní sčítání vodních ptáků v České republice v lednu 2012. *Aythya*, 5: 1–13.

- MUSILOVÁ, Z., MUSIL, P. and PROKEŠOVÁ, E. 2014b. Mezinárodní sčítání vodních ptáků v České republice v lednu 2013. *Aythya*, 5: 14–26.
- MUSILOVÁ, Z., MUSIL, P. and PROKEŠOVÁ, E. 2016a. Mezinárodní sčítání vodních ptáků v České republice v lednu 2014. *Aythya*, 6: 2–14.
- MUSILOVÁ, Z., MUSIL, P. and PROKEŠOVÁ, E. 2016b. Mezinárodní sčítání vodních ptáků v České republice v lednu 2015. *Aythya*, 6: 15–26.
- MUSILOVÁ, Z., PROKEŠOVÁ, E. and MUSIL, P. 2017a. Mezinárodní sčítání vodních ptáků v České republice v lednu 2016. *Aythya*, 7: 1–13.
- MUSILOVÁ, Z., MUSIL, P. and PROKEŠOVÁ, E. 2017b. Mezinárodní sčítání vodních ptáků v České republice v lednu 2017. *Aythya*, 7: 1–14.
- MUSILOVÁ, Z., MUSIL, P. and NEUŽILOVÁ, Š. 2019. Mezinárodní sčítání vodních ptáků v České republice v lednu 2019. *Aythya*, 7: 44–59.
- SHURTLEFF, L. L. and SAVAGE, C. 1996. *The Wood Duck and the Mandarin: the Northern Wood Ducks*. Berkeley: University of California Press.
- ŠTASTNÝ, K. and HUDEC, K. 2016. *Fauna ČR, svazek 31. Ptáci – Aves. Díl I*. Praha: Academia.
- UNEP-WCMC. 2015. *Update on the status of non-native waterbird species within the AEWMA Area*. Cambridge: UNEP-WCMC.
- VALÁŠEK, M. 2013. Kachnička mandarinská (*Aix galericulata*) v Národním parku Podyjí – nová hnízdní lokalita pro Českou republiku. *Crex*, 33: 138–142.

Contact information

Vladimír Mikule: mikule@mendelu.cz