National Monitoring and Habitat Use Study of the Black-faced Spoonbill

Report 2024

인천광역시
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EAAFP

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National Monitoring and Habitat Use Study of the Black-faced Spoonbill

Report 2024

Research Organisation

Black-faced Spoonbill and Friends, Waterbird Network Korea (NPO)

31 January 2025

This research was carried out with the support of the Incheon Metropolitan City, as part of a collaborative initiative between the Incheon Metropolitan City and the Secretariat of the East Asian-Australasian Flyway Partnership (EAAFP).

Research Summary

Research Overview

- Estimating the population of the Black-faced Spoonbill through nationwide monitoring and analyzing its habitats in South Korea.
- Analyzing habitat use of the Black-faced Spoonbill using colour bands and GPS tracking devices.

Research Content

- Nationwide, Black-faced Spoonbill monitoring (conducted four times between August and November 2024)

Key Findings

- According to four rounds of nationwide monitoring conducted between August and November 2024, the highest number of Black-faced Spoonbills (Platalea minor) was recorded in September, totaling 4,768 individuals. Based on the maximum number observed in each region, it was estimated that up to 5,918 individuals were inhabiting across the country during the survey period.
- By month, 4,811 individuals were observed in 17 regions in August, 4,768 individuals in 18 regions in September, 4,729 individuals in 18 regions in October, and a significant drop to 433 individuals in 17 regions in November. After peaking in September, the number of birds declined from October onward, indicating the start of migration.
- In September, 57.0% of the total observed Black-faced Spoonbills were recorded in the northwestern region, while 40.8% were recorded in the mid-western region. Only 2.2% were recorded in the southern region, including Jeju Island. However, in November, as the total number decreased significantly, the proportion of individuals observed in the southern region increased to 15.0%.
- By region, the highest counts were recorded as follows: 3,085 individuals in the northwestern region (August), 1,847 in the mid-western region (September), and 223 in the southern region (October).
- The key habitats with the highest concentrations of Black-faced Spoonbills included the Yeonggwang tidal flats, Ganghwa County, Jung-gu in Incheon, Yubu Island in Seocheon, the Daebu and Sihwa areas in Ansan, and the Songdo region.

Recommendation

- Continued conservation efforts are urgently needed to protect the key habitats of the Black-faced Spoonbill.
- There is a pressing need to consider designating major tidal flats, coastal reservoirs, and abandoned salt pans—regularly used by the species—as protected areas. Alternative measures such as habitat conservation strategies and restrictions on development and land reclamation should also be explored.
- Targeted protection and management of the main breeding and roosting sites are essential. Based on this study, key habitats such as the Yeonggwang tidal flats, Ganghwa County, and Jung-gu in Incheon should be considered for expanded wetland protection sites. Furthermore, designating these areas as part of the World Natural Heritage "Getbol, Korean Tidal Flats" or as Flyway Network Sites (FNS) would be desirable.
- To protect main roosting sites, actions such as banning fishing activities and limiting public access are necessary. In addition, broader public awareness campaigns and expanded conservation efforts should be promoted.
- It is hoped that continued monitoring of the Black-faced Spoonbill will lead to greater public understanding and appreciation of the species and its habitats, thereby reinforcing the importance of long-term conservation.

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Ⅰ. Overview

1 Study Overview

A. Project Title

❙ National Monitoring and Habitat Use Study of the Black-faced Spoonbill

B. Purpose

❙ Background

- The Black-faced Spoonbill is classified as an internationally endangered species by the IUCN (BirdLife International, 2017), and requires ongoing protection and management.
- This species is confined to East Asia, with more than 90% of the global breeding population nesting on the Korean Peninsula.
- Moreover, the Black-faced Spoonbill extensively utilizes the west coast of Korea from March to November, and some individuals overwinter in Jeju Island and the southern coastal regions, making Korea a crucial breeding and habitat area for the species.
- However, the historical large-scale reclamation of tidal flats and continued coastal development have led to a steady decline in available habitats for the Black-faced Spoonbill.
- Therefore, it is necessary to collect baseline data on the population trends and habitat use of the species within Korea to support effective protection and management strategies.

❙ Objective

- Through nationwide monitoring of the Black-faced Spoonbill, this project aims to estimate the total population of the species inhabiting Korea. By involving various civil society organizations and relevant institutions, the study also seeks to promote public awareness and support future conservation and management efforts.
- In addition, the study investigates habitat use in specific regions to provide essential baseline data for the development of future conservation planning.

C. Project Overview

❙ Summary

- Project Duration: August – November 2024
- Supported by: East Asian–Australasian Flyway Partnership (EAAFP) Secretariat
- Organized by: Black-faced Spoonbill and Friends, Waterbird Network Korea (WNK)
- Participating Organizations and Groups: Black-faced Spoonbill NGO Network, Ganghwa Birdwatching Club, Ganghwa Citizens' Solidarity, Seocheon Bird Ecology Exhibition Hall, Saemangeum Citizens' Monitoring Group, Friends of Wetlands and Birds, Jeju Wildlife Research Center, Eco-Horizon Institute, National Institute of Ecology, National Institute of Biological Resources, Korea Association for Bird Protection (Asan Branch), Oriental Stork Monitoring Team, and others
- Lead Researchers: In-Ki Kwon, Kisup Lee, Jonghyun Park, Heungbeom Oh, Kyungoh Cho
- Monitoring Participants: Youngsook Kang, Insook Kang, Changwan Kang, Kyounghwan Kweon, Kyungsook Kim, Doyeon Kim, Mieun Kim, Mijeong Kim, Boksoon Kim, Sangsup Kim, Seokyee Kim, Soonrae Kim, ShinHwan Kim, Youngchul Kim, Woocheol Kim, Yunjun Kim, Eunhee Kim, Incheol Kim, Junghee Kim, Jinkeun Kim, Jingum Kim, Hyungtae Kim, Hwajeong Kim, Eunsuk Roh, Gichan Ryu, Soonsub Ryu, Ho Myoung, Gayun Park, Moonsik Park, Minja Park, Yeonglan Park, Youkil Park, Eunha Park, Jungwoon Park, Jinseon Park, Hyunggen Park, Namok Pin, Taekhyun Seol, Jihye Son, Eunhee Song, Aesung Shin, Hyunho Shin, Jaewon Shim, Minseung Yang, Sangkyung Yeo, Dongpil Oh, Seungjoo Oh, Seungjun Oh, Jiyun Oh, Hwanbong Oh, Hyukjin Woo, Sungyeon Yoo, Ryeoeun Youn, Jaeok Yoon, Hee Yoon, Kyesook Lee, Kwangbok Lee, Dawon Lee, Myungjung Lee, Minam Lee, Mihwa Lee, Yeongyeong Lee, Yesoon Lee, Euisoon Lee, Jongryeol Lee, Hyeok Jae Lee , Bangyeon Im, Taeksu Jang, Heesuk Jang, Sumin Jeon, Jiye Jeon, Hongtae Jeon, Giseok Jung, Sunghye Jung, Eunah Jung, Euisoon Jung, Hajin Jung, Giseok Cho, Sooyoung Cho, Yunhee Jo, Hyeonja Jo, Yungki Ju, Namjoon Ji, Insook Ji, Myungsook Choi, Soonrae Choi, junghui Choi, Jihyun Choi, Joonsik Tak, Haegwang Han, Hyungbok Ham, Cheolhee Hong, Soo Kyeong Hwang, Youngja Hwang and others.
- A total of 95 or more individuals participated (in Korean alphabetical order), each having participated at least once.

2 Project Implementation Plan

Nationwide Monitoring of the Black-faced Spoonbill

- Period: Once a month from August to November 2024
- Details: Simultaneous monitoring of key Black-faced Spoonbill sites across Incheon Metropolitan City and other major regions in Korea was conducted to identify habitat locations, the number of birds, the importance of each site, and potential threats.

Ⅱ. Current Status of the Black-faced Spoonbill

1 Characteristics of the Black-faced Spoonbill

A. Taxonomy

The genus *Platalea* includes six known species of spoonbills:

- Black-faced Spoonbill (*Platalea minor*)
- Eurasian Spoonbill (*P. leucorodia*)
- Royal Spoonbill (*P. regia*)
- Yellow-billed Spoonbill (*P. flavipes*)
- African Spoonbill (*P. alba*)
- Roseate Spoonbill (*P. ajaja*) (Hancock et al., 1992)

Among these, only two species are regularly observed in Korea: the Black-faced Spoonbill and the Eurasian Spoonbill.

The Black-faced Spoonbill arrives in Korea around March to breed and remains until autumn, with a small number overwintering in the southern regions such as Jeju Island.

The Eurasian Spoonbill is considered a winter visitor though it is occasionally observed in the summer as well (Park, 2014).

B. Morphological Characteristics of the Black-faced Spoonbill

- The Black-faced Spoonbill is the smallest species within the genus *Platalea*, measuring approximately 70-80cm in body length. It has an overall white body, with a distinctive black face and a spatula-shaped black bill.
- During the breeding season, adults develop long, tufted plumages on the head, and the chest turns a noticeable yellow.

  In the non-breeding season, the head plumages disappear, and the yellow colouration on the chest fades or becomes barely visible.
- Typically, males are slightly larger than females, with longer bills and legs.

Adult BFS

Juvenile BFS

Figure Ⅱ-1. Appearance of Adult and Juvenile Black-faced Spoonbills

C. Ecological Characteristics of the Black-faced Spoonbill

- The Black-faced Spoonbill forages in a variety of habitats, including coastal areas, tidal flats, estuaries, farmland, and reservoirs. And it is known to be diurnal as well as nocturnal in its feeding behavior (Swennen & Yu, 2004). In Korea, during high tide, it uses rocky islets, reservoirs, and wetlands near the coast as roosting sites (WWF-Korea, 2018; Waterbird Network Korea, 2020, 2021).
- The species feeds by sweeping its bill from side to side in shallow waters (typically 5–21 cm in depth), preying on fish, shrimp, and other crustaceans (Kim et al., 2018; Yoo et al., 2019; Yu & Swennen, 2004).
- Breeding mainly occurs colonially on uninhabited islands along Korea's west coast, with small populations also reported breeding in Liaoning Province in China, the Russian Far East, and North Korea (Chong et al., 1996; Ding et al., 1999; Ueta et al., 2002; Wei et al., 2005; Shibaev, 2010; Kang et al., 2016; Kwon, 2017).
- Nests, typically 40–50 cm in size, are built on steep cliffs and ground in grassy areas (WWF-Korea, 2018).
- In winter, the species migrates to southern Japan, southern China, Taiwan, and Hong Kong, and some individuals also overwinter in Southeast Asia. A small number spend the winter in Jeju Island, Korea (Choi et al., 2007; Yu et al., 2022).

Figure Ⅱ-2. Breeding Black-faced Spoonbills on an Artificial Island in Namdong Reservoir

- Although no precise population estimates were available in the past, the Black-faced Spoonbill was known to be commonly observed in tidal flats and wetlands throughout the early 1900s (Brazil, 2009).
- However, due to various threats such as the Korean War, egg harvesting, development, pollution, and human disturbance (Chan et al., 2010), the estimated global wintering population declined to just 288 individuals by 1988. As a result, the species was listed as Critically Endangered on the IUCN Red List in 1994.
- Through the international conservation efforts, the population has gradually increased over time, and in 2000, the species was downlisted to Endangered.
- To monitor the global population of the Black-faced Spoonbill, simultaneous winter surveys have been conducted annually since the winter of 1993–1994, focusing on key wintering sites such as Taiwan, Hong Kong, and mainland China.

  Survey results showed: 294 individuals in 1989, 351 individuals in 1993–1994, Steady increases thereafter, reaching 6,162 in January 2022, 6,633 in 2023, and 6,988 in 2024 (Yu et al., 2023).

D. Changes in Breeding Sites and Populations in Korea

- The annual monitoring of breeding populations in Korea began in 2003, led by a small group of experts, civil organizations, and relevant institutions. In present, Research Center for Endangered Species of National Institute of Ecology and the Waterbird

Network Korea play important roles in ongoing monitoring efforts.

- In 2003, approximately 100 breeding pairs were confirmed across five breeding sites near the border between South and North Korea. In 2006, breeding was first confirmed at Gaksiam and Suhaam, islands close to Incheon's mainland. By 2009, Black-faced Spoonbills had also begun nesting on artificial islands within the Namdong Reservoir.
- Since then, the number of breeding sites has expanded to over 20, and the breeding population continues to grow annually (see Figure II-3).

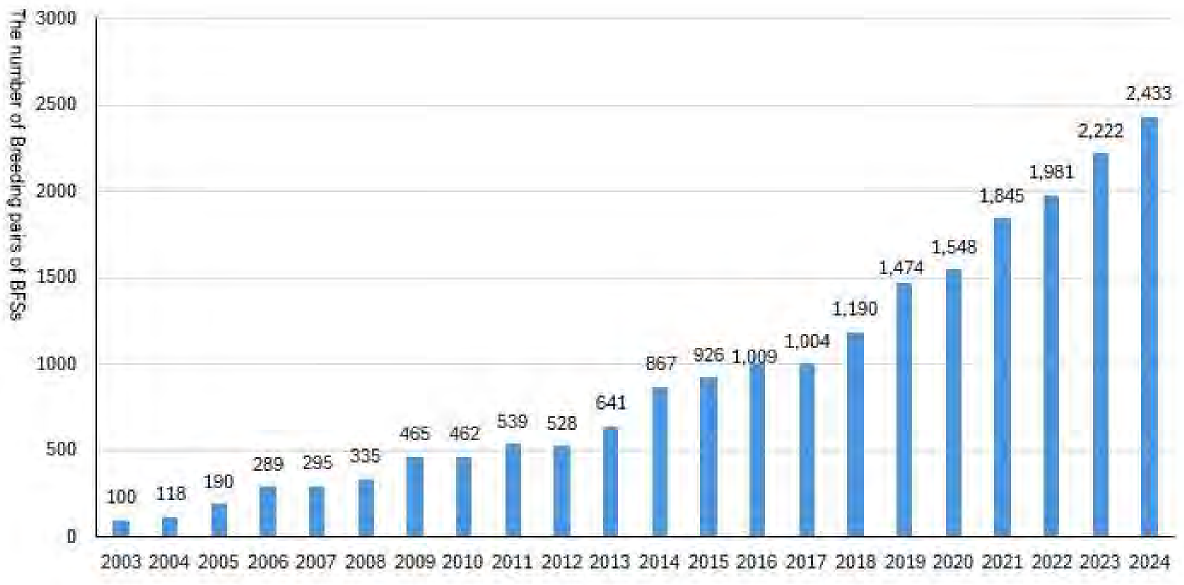


Figure II-3. Trends in the Number of Breeding Pairs of Black-faced Spoonbills in Korea by Year
(Source: Waterbird Network Korea, 2023; Research Center for Endangered Species, National Institute of Ecology, 2023)

- In 2024, a total of 24 breeding sites were confirmed, with an estimated 2,433 breeding pairs of Black-faced Spoonbills (Reserch Center for Endangered Species, National Institute of Ecology; Shinan County World Heritage Division).
- Notably, in 2024, breeding was newly confirmed on Janggo Island, located in the northern part of Yeongjong Island, Incheon, with 39 breeding pairs. At Napdaegi Island in Yeonggwang, Jeollanam-do, 3 pairs resumed breeding, and the number of breeding pairs at Bulmugi Island in Shinan, Jeollanam-do, increased significantly from 2 pairs in 2023 to 18 pairs in 2024. The largest breeding colony was once again found at Guji Island in Incheon, where over 500 pairs were confirmed to be breeding.

Ⅲ. Nationwide Monitoring of the Black-faced Spoonbill

1 Methodology

A. Monitoring Scope

❙ Temporal Scope

- Regular monitoring was conducted once per month from August to November 2024:
  - ▷ 1st Survey: August 23–25, 2024 (with additional surveys in some areas on the 25th)
  - ▷ 2nd Survey: September 21–23, 2024
  - ▷ 3rd Survey: October 4–7, 2024
  - ▷ 4th Survey: November 15–17, 2024
- Survey dates were selected based on tidal cycles and local conditions to ensure optimal observation periods for Black-faced Spoonbills.

❙ Geographical Scope

- The survey area was divided into three major regions:
  Northwestern Region, Midwestern Region, Southern Region
- A total of 21 key areas across the country were monitored, including major habitats in Incheon Metropolitan City. (See Table III-1 and Figure III-1 for details)

Table Ⅲ-1. List of Survey Sites for the National Monitoring of Black-faced Spoonbills

Region	Monitoring Sites	Notes
Northwestern	Ongjin County (Baengnyeong-Yeonpyeong Islands), Budo-myeon (Ongjin), Ganghwa County, Seo-gu (Incheon), *Yeongjongdo*, Songdo*	Includes all Incheon sites
	Han River Estuary, Ansan Bay, Hwaseong Wetlands (tidal flats), Asan Bay	
Midwestern	Taean, Cheonsu Bay, Yubu Island (Seocheon), Saemangeum, Gomso Bay, Yeonggwang Tidal Flats	Includes Boryeong
Southern	Muan, Shinan Tidal Flats, Suncheon Bay-Yeosu, Nakdong Estuary, Jeju Island	Includes Jangheung, Gwangyang Bay, Haenam

Figure Ⅲ-1. 2024 National BFS Monitoring Sites and Regional Classification.

B. Survey Method and Data Collection

❙ Survey Method

- The distribution of Black-faced Spoonbills varies significantly depending on tidal levels. The species is most easily observed during high tide, when tidal flats are submerged and birds gather at roosting sites near estuaries, wetlands, and coastal rocks.
- Although each survey was scheduled over a 3-day primary period, supplementary surveys were conducted 2–3 days before or after the main dates in some areas.
  Surveys focused on roosting sites during high tide, and in regions with a wide area or multiple roosts, the survey area was further subdivided and assigned to different teams. Adjacent locations were surveyed on the same day to avoid double-counting of individuals.
- Surveys were conducted by vehicle (or by boat in some areas), and observers recorded the number of individuals using binoculars and spotting scopes from accessible observation points. Additional data, such as local site conditions and the presence of leg bands, were also recorded.

❙ Data Collection and Analysis

- A citizen-participatory ecological monitoring platform called “Getbol Keepers” hosted the mission titled “2024 Nationwide Monitoring of the Black-faced Spoonbill.”
- Observers uploaded their records and photos of sightings to the platform. Data collected included: Coordinates of observation sites, Species observed, Number of individuals, Presence of leg bands or tracking devices, Date and time of observation
- This information was gathered from the website (see Figure III-2) and supplemented with locational data from regional survey teams.
- Distribution data by region and time were mapped using Google Earth and further analyzed using GIS software.

Figure Ⅲ-2. 2024 BFS National Monitoring Mission on the Getbol Keepers Platform

2 Results

A. Monitoring Results

❙ Overall Summary

- Based on the highest number of individuals observed in each region between August and November 2024, the estimated maximum number of Black-faced Spoonbills in Korea during the monitoring period was 5,918 individuals (see Table III-2).
- By month: August: 4,811 individuals across 17 regions (including additional sites), September: 4,768 individuals across 18 regions, October: 4,729 individuals across 18 regions, November: A significant decline to 433 individuals across 17 regions

Table Ⅲ-2. Monthly Counts of Black-faced Spoonbills by Site (2024 National Monitoring)

No.	Site	Counts of Black-faced Spoonbills				
		Aug	Sept	Oct	Nov*	Max
1	Ongjin (Baengnyeong and Yeonpyeong Islands)	0	0	0	0	0
2	Bukdo-myeon, Ongjin County	155	61	78	0	155
3	Ganghwa County	656	991	955	67	991
4	Han River and Imjin River Estuaries	17	13	28	12	28
5	Seo-gu, Incheon	17	18	0	0	18
6	Jung-gu (Incheon), Yeongjongdo, Boreum Island	471	399	372	26	471
7	Namdong (Incheon), Songdo, Siheung Gaetgol Wetland	222	189	198	14	222
8	Ansan (Sihwa Lake, Daebu Island)	640	427	669	23	669
9	Hwaseong Wetlands	309	419	381	32	419
10	Asan Bay	598	201	280	17	560
11	Cheonsu Bay, Dangjin, Boryeong	22	24	84	3	84
12	Seocheon Area (including Gunsan Port)	355	519	510	63	519
13	Saemangeum Area	202	88	132	9	202
14	Gomso Bay Area	188	131	231	6	231
15	Yeonggwang Tidal Flats	860	1,085	588	86	1,085
16	Muan and Shinan Tidal Flats	63	97	109	10	109
17	Suncheon Bay, Yeoja Bay, Gwangyang Bay	2	11	18	19	19
18	Nakdong Estuary	0	3	14	11	14
19	Jeju Island	0	0	1	30	30
20	Others (e.g., Haenam, Jindo, etc.)	34	92	81	5	92
Total		4,811	4,768	4,729	433	5,918
Number of Observation Sites		17	18	18	17	19

- During the survey period, the highest number of Black-faced Spoonbills was observed in September 2024, with 4,768 individuals, followed by a similar count in October. In November, the number dropped significantly, indicating that many individuals had already migrated to wintering grounds.
- Conversely, Jeju Island began recording sightings of Black-faced Spoonbills in October, with 30 individuals observed by November.
- In Haenam, where sightings had typically begun after September in previous years, multiple individuals were recorded consistently starting from August in this survey.
- The largest regional concentration of Black-faced Spoonbills was found at the Yeonggwang tidal flats, with 1,085 individuals in September.
- This was followed by 991 individuals in Ganghwa County, 669 in Ansan (Sihwa and Daebu areas), and 598 in Asan Bay.

❙ Monthly Trends in Black-faced Spoonbill Numbers

- Since the launch of nationwide synchronized surveys in 2020, the maximum number of individuals observed each year has steadily increased: 2020: 3,861, 2021: 4,523, 2022: 5,230, 2023: 5,360, 2024: 5,918
- In 2021, the population increased by 17.1% compared to 2020, followed by a 15.6% increase in 2022 compared to 2021. Although the growth rate slowed to 2.4% in 2023, it showed a renewed increase of 11.1% in 2024 compared to 2023.
- When comparing the month of August over a four-year period, the number of observed individuals steadily increased: 3,239 individuals in August 2020, 3,913 in 2021, 4,160 in 2022, 4,163 in 2023, and 4,811 in 2024 (Figure III-3).
- In September, the population showed an increasing trend from 3,327 individuals in 2020 to 4,063 in 2021, 4,687 in 2022, and 5,026 in 2023. However, it slightly decreased to 4,768 in 2024. Given that the maximum number of individuals observed at regional sites increased compared to the previous year, it is possible that unfavorable weather conditions (e.g., strong winds and rain) during the field survey in September contributed to the decline in total count (Figure III-3).
- In October, the number of individuals fluctuated: 2,203 in 2020, 3,725 in 2021, 2,335 in 2022, 3,741 in 2023, and 4,729 in 2024. Notably, the counts in 2020 and 2022 were significantly lower than in other years. This is likely due to the timing of the surveys, which were conducted in late October in those two years, whereas surveys in other years took place in early to mid-October. October is a peak migration period for the Black-faced Spoonbill as they begin their movement toward wintering grounds, and the

number of observed individuals can vary greatly depending on the survey date. The notably high count in October 2024 is presumed to result from the survey being conducted earlier in the month, before the main migratory departure began (Figure III-3).

❙ Regional Comparison

- From August to October, over 90% of all observed Black-faced Spoonbills were found in the northwestern and midwestern regions. By November, the southern region, including Jeju Island, showed a relative increase in sightings (Figure III-4).
- In the northwestern region, a maximum of 3,085 individuals was recorded in August. In the mid-western region, the highest count was 1,847 individuals in September, while in the southern region, a maximum of 223 individuals was recorded in October.
- After October, both the northwestern and midwestern regions showed a sharp decline in numbers, consistent with the species' migration patterns.

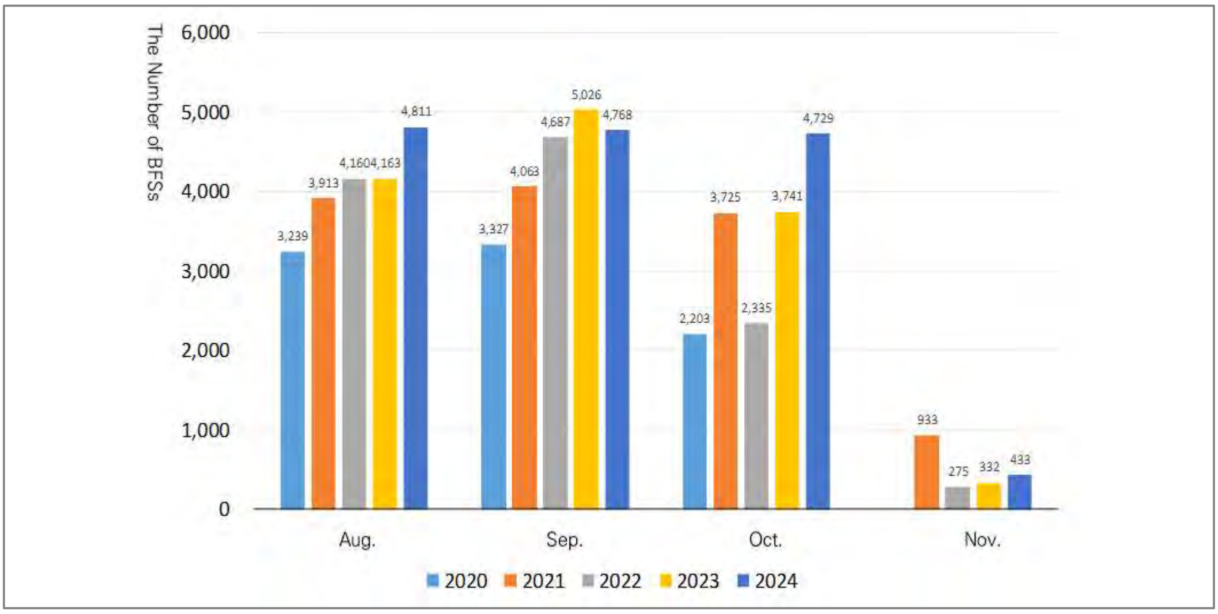


Figure Ⅲ-3. Monthly Monitoring Results of BFS from 2020 to 2024

- In August, a total of 3,085 individuals were observed in the northwestern region, 1,627 in the midwestern region, and 99 in the southern region (Figure III-4).
- In September, counts increased in two of the regions, with 2,718 individuals recorded in the northwest, 1,847 in the midwest, and 203 in the south (Figure III-4).
- In October, 2,961 individuals were observed in the northwest, 1,545 in the midwest, and 223 in the south, showing slight variations compared to September (Figure III-4).

– By November, the number of birds had dropped significantly, with only 191 individuals in the northwest, 167 in the midwest, and 75 in the south (Figure III–4).

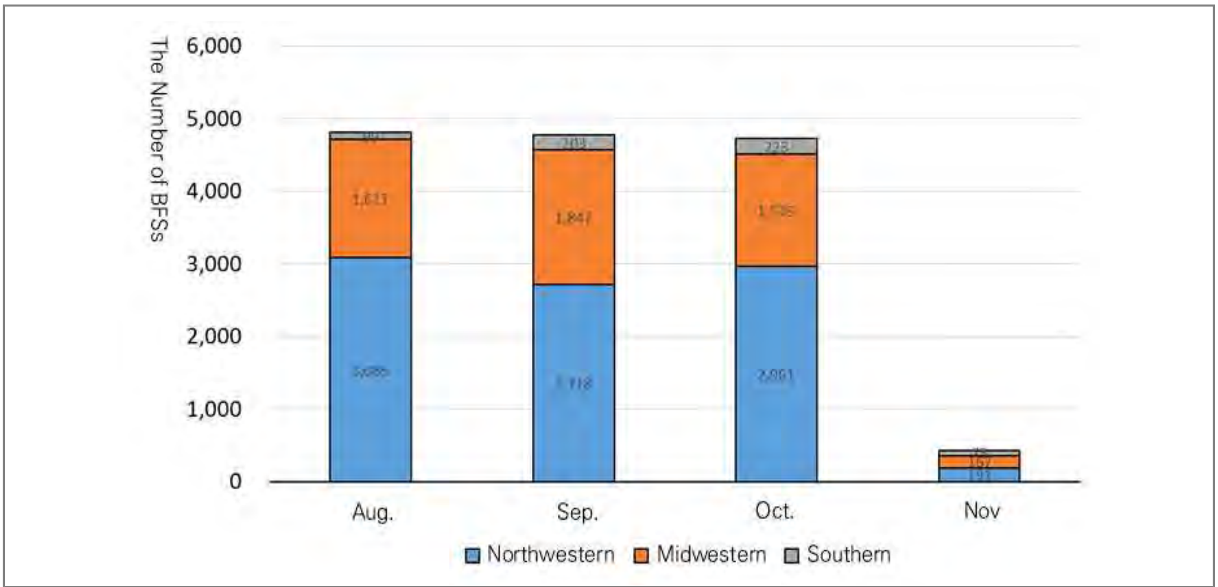


Figure Ⅲ–4. Changes in BFS Numbers by Region in 2024

- From 2020 to 2023, the highest number of Black-faced Spoonbills was generally observed in September each year, showing a gradual upward trend. However, in September 2024, the count slightly declined compared to the previous year.
- Across all regions, the maximum number of individuals observed has shown an increasing trend, with the midwestern region showing the most significant growth in population.
- In the northwestern region, between 2,094 and 3,085 individuals were observed in August, 2,149 to 2,952 in September, and 1,236 to 2,961 in October.
- In the mid-western region, the observed numbers ranged from 1,123 to 1,627 in August, 1,104 to 1,904 in September, and 811 to 1,545 in October.
- In the southern region, 22 to 134 individuals were observed in August, 34 to 203 in September, and 23 to 270 in October.

Table Ⅲ–3. Comparison of BFS Counts by Region from 2020 to 2024 (August–October)

Region	2020			2021			2022			2023			2024		
	Aug	Sep	Oct	Aug	Sep	Oct	Aug	Sep	Oct	Aug	Sep	Oct	Aug	Sep	Oct
Northwestern	2,094	2,149	1,356	2,538	2,468	2,256	2,699	2,854	1,236	2,445	2,952	2,045	3,085	2,718	2,961
Midwestern	1,123	1,104	811	1,330	1,561	1,446	1,423	1,775	980	1,584	1,904	1,426	1,627	1,847	1,545
Southern	22	74	32	45	34	23	38	58	119	134	170	270	99	203	223
Total	3,239	3,327	2,203	3,913	4,063	3,725	4,160	4,687	2,335	4,163	5,026	3,741	4,811	4,768	4,729

❙ Regional Distribution

- The distribution of Black-faced Spoonbills in August, September, and October 2024 did not show significant variation by month (Figure III-5).
  By November, most of the birds had migrated to their wintering grounds, resulting in a sharp decline in numbers, while southern regions such as Suncheon and Jeju Island saw a slight increase (Figure III-5).
- Hundreds of individuals continued to be observed through October in major breeding-adjacent sites like Ganghwa, Songdo, Yeongjong Island, and the Yeonggwang tidal flats in Incheon.
- Despite being far from known breeding sites, Asan Bay and the Hwaseong Wetlands also recorded more than 200 individuals, suggesting their importance as stopover or feeding sites (Figure III-5).
- In the Saemangeum area, the number of observed Black-faced Spoonbills has increased since 2020, likely due to the growing breeding population near Noru Island in Seocheon and the establishment of new nesting sites at Myeongamyeo and Geomeunyeo in Gunsan.
- In Incheon, key distribution sites included the southern tidal flats of Ganghwa near the breeding colonies of Gaksiam and Maedo, the Gojan tidal flats adjacent to the Namdong Reservoir, and the southern tidal flats of Yeongjong Island, including wetlands inside the dredged spoil disposal sites.
- In Gyeonggi-do, main observation sites included Daebu Island and the Sihwa tidal flats in Ansan. Even at locations far from breeding sites, such as Hwaseong Lake, surrounding tidal flats, and the Pyeongtaek Port Reservoir, Black-faced Spoonbills continued to be observed after the breeding season.
- In Seocheon, over hundreds of individuals were observed at coastal tidal flats, Yubu Island, and Geumran Island, which are likely used as high-tide roosting sites.
- At the Yeonggwang tidal flats, birds used the wide mudflats as feeding grounds during low tide, and the Bulgapcheon Estuary, abandoned salt pans, and remaining reservoirs as roosting areas during high tide.
- In the southern regions, Black-faced Spoonbills were rarely seen in August and September, but their numbers slightly increased in October, corresponding with their southward migration. Still, only several dozen individuals were observed (Figure III-5).

August 2024

September 2024

October 2024

November 2024

Figure Ⅲ-5. Monthly Distribution and Abundance of BFS (Aug–Nov 2024).

❙ Key Habitat Areas

- In August, the highest number of Black-faced Spoonbills was recorded at the Yeonggwang tidal flat, with 860 individuals (17.9%). This was followed by Ganghwa County with 656 individuals (13.6%), the Ansan area (Siwha and Daebu) with 640 individuals (13.3%), Asan Bay with 598 individuals (12.4%), and Jung-gu, Yeongjong, and Boleum Islands in Incheon with 471 individuals (9.8%) (Table III-4).
- In September, Yeonggwang tidal flat again recorded the highest number, with 1,085 individuals (22.8%), followed by Ganghwa County with 991 individuals (20.8%), Seocheon (including Gunsan Port) with 519 individuals (10.9%), Ansan (Siwha and Daebu) with 427 individuals (9%), and Hwaseong Wetland with 419 individuals (8.8%) (Table III-4).
- In October, the largest number of Black-faced Spoonbills was observed in Ganghwa County with 955 individuals (20.2%). This was followed by Ansan (Siwha and Daebu) with 669 individuals (14.1%), Yeonggwang tidal flat with 588 individuals (12.4%), Seocheon (including Gunsan Port) with 510 individuals (10.8%), and Hwaseong Wetland with 381 individuals (8.1%) (Table III-4).
- In November, Yeonggwang tidal flat recorded the highest number with 86 individuals (19.9%), followed by Ganghwa County with 67 individuals (15.5%), Seocheon (including Gunsan Port) with 63 individuals (14.5%), Hwaseong Wetland with 32 individuals (7.4%), and Jeju Island with 30 individuals (6.9%) (Table III-4).

Table Ⅲ-4. Top 5 Sites with the Highest Monthly BFS Counts (2024 National Monitoring)

Rank	August		September		October		November	
	Site	Count (%)	Site	Count (%)	Site	Count (%)	Site	Count (%)
1	Yeonggwang Tidal Flats	860 (17.9)	Yeonggwang Tidal Flats	1,085 (22.8)	Ganghwa County	955 (20.2)	Yeonggwang Tidal Flats	86 (19.9)
2	Ganghwa County	656 (13.6)	Ganghwa County	991 (20.8)	Ansan (Sihwa, Daebu)	669 (14.1)	Ganghwa County	67 (15.5)
3	Ansan (Sihwa, Daebu)	640 (13.6)	Seocheon (incl. Gunsan Port)	519(10.9)	Yeonggwang Tidal Flats	588 (12.4)	Seocheon (incl. Gunsan Port)	63 (14.5)
4	Asan Bay	598 (12.4)	Ansan (Sihwa, Daebu)	427 (9)	Seocheon (incl. Gunsan Port)	510 (10.8)	Hwaseong Wetlands	32 (7.4)
5	Jung-gu (Incheon), Yeongjong Island, Boreum	471 (9.8)	Hwaseong Wetlands	419 (8.8)	Hwaseong Wetlands	381 (8.1)	Jeju Island	30 (6.9)
	Total	3,225	Total	3,441	Total	3,103	Total	278

B. Regional and Temporal Results

❙ Baengnyeong and Yeonpyeong Island, Ongjin County

- A synchronized survey was conducted on Baengnyeong Island in 2024, but no Black-faced Spoonbills were observed.
  For the Yeonpyeongdo area, no synchronized survey was conducted in 2024 (see Figure III-6).
- In a previous survey conducted in August 2021, 29 individuals were recorded on Yeonpyeongdo. However, due to the lack of follow-up surveys, there have been no updated records of Black-faced Spoonbills in the area since then (Figure III-6).

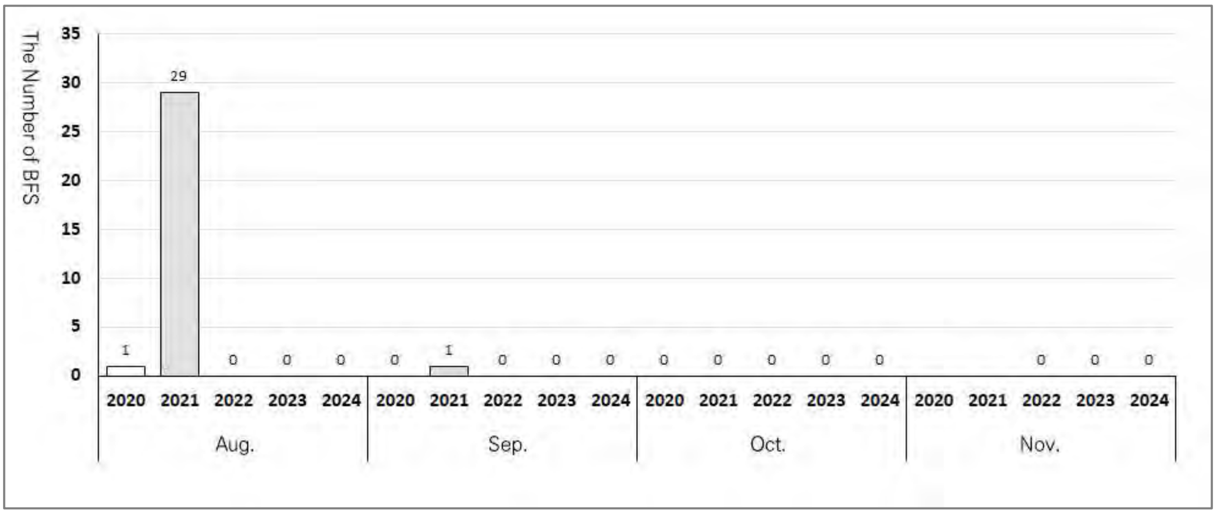


Figure Ⅲ-6. Monthly BFS Counts in Baengnyeong and Yeonpyeong Islands, Ongjin County (Aug 2020–Jan 2024).

❙ Ganghwa Island (Including Ganghwa Main, Seokmo, and Gyodong Island etc.)

- In Ganghwa County, 656 individuals were observed during the August 2024 survey, 991 in September, 955 in October, and 67 in November (Figure III-7).
- Among the past five years, the highest number of Black-faced Spoonbills was recorded in September 2024 (991 individuals), followed by October 2024 (955 individuals), and September 2022 (898 individuals).
- In August 2020, 624 individuals were observed, followed by 444 in September and 356 in October. In 2021, 682 individuals were recorded in August, 653 in September, and 453 in October.
- In 2022, 707 individuals were observed in August, 898 in September, 563 in October, and 80 in November. In 2023, there were 363 individuals in August, 877 in September, 662 in October, and 60 in November. In 2024, 656 individuals were observed in August, 991 in September, 955 in October, and 67 in November (Figure III-7).

- On the main island of Ganghwa, the majority of observations were concentrated in the southern areas, including Gaksiam, Seondu-ri, Yeocha-ri, and Dongmak-ri. In contrast, no large flocks were recorded in the northern part of the island (Figures III-8 and III-9).
- Around Seokmo Island, most individuals were observed on the western and southern tidal flats. During the September survey, more than 100 spoonbills were observed resting at Daesongdo on the western side of the island (Figure III-10).
- In the Seodo-myeon area of Ganghwa (including Boleumdo, Jumundo, and Achado), 209 individuals were recorded in August, and a large flock of 310 individuals was observed in September at the northern rocks of Achado and the southern areas of Jumundo and Boleumdo. In subsequent surveys, smaller flocks were observed widely dispersed across the islands (Figure III-10).
- In the Gyodongdo area, Black-faced Spoonbills were mainly observed using the northern and eastern tidal flats, including areas adjacent to the North Korean mainland. Few individuals were recorded in the southern part of the island (Figure III-11).

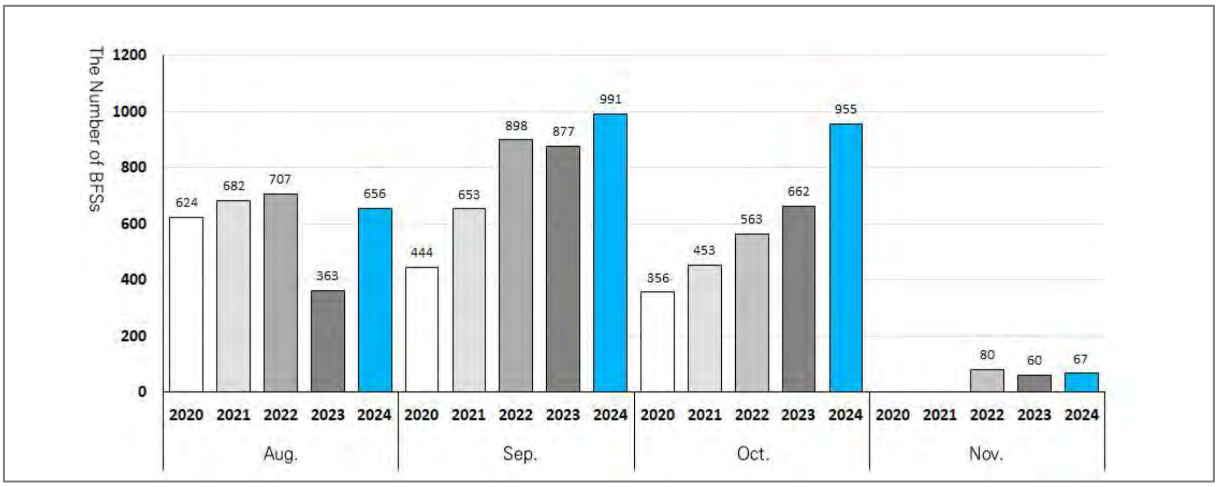


Figure Ⅲ-7. Monthly BFS Counts on Ganghwa Island (Aug 2020–Nov 2024).

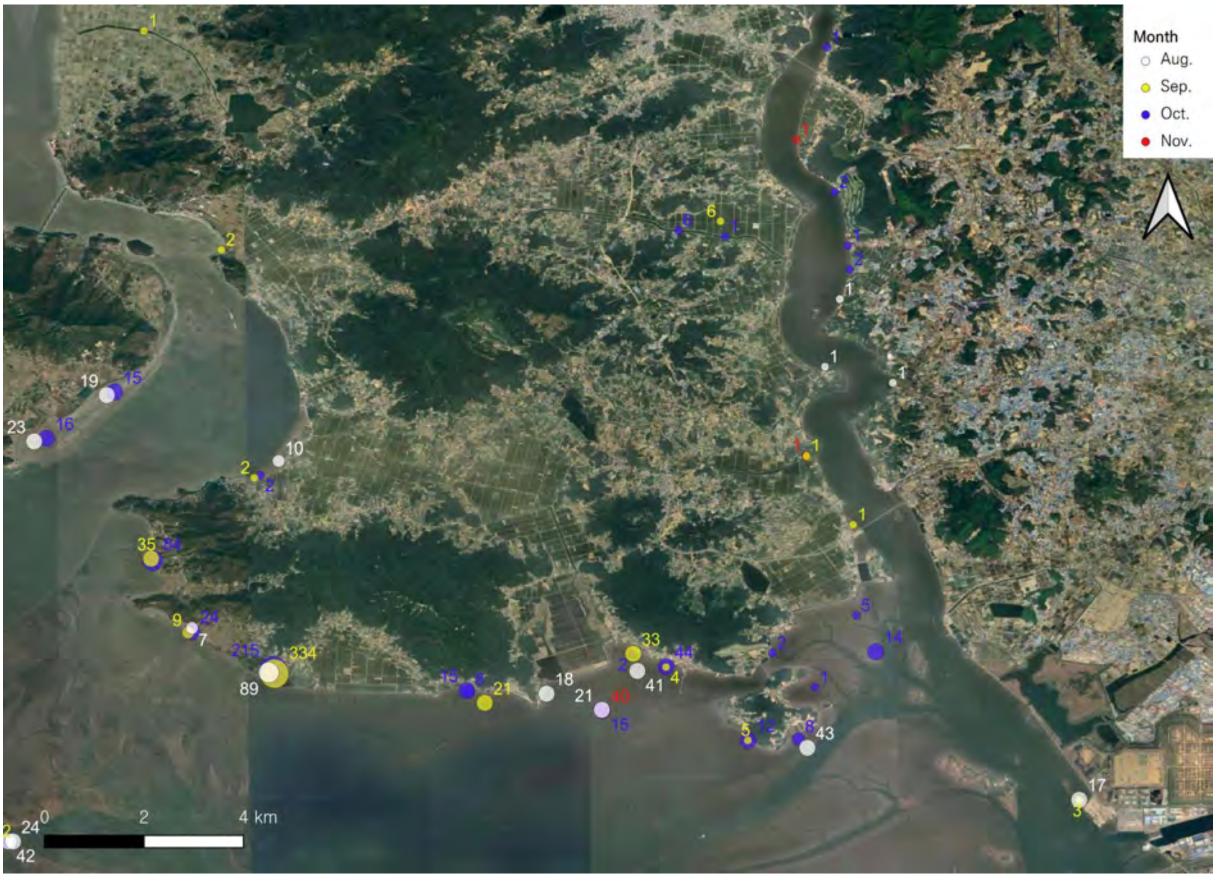


Figure Ⅲ-8. Observation Points in Southern Ganghwa.

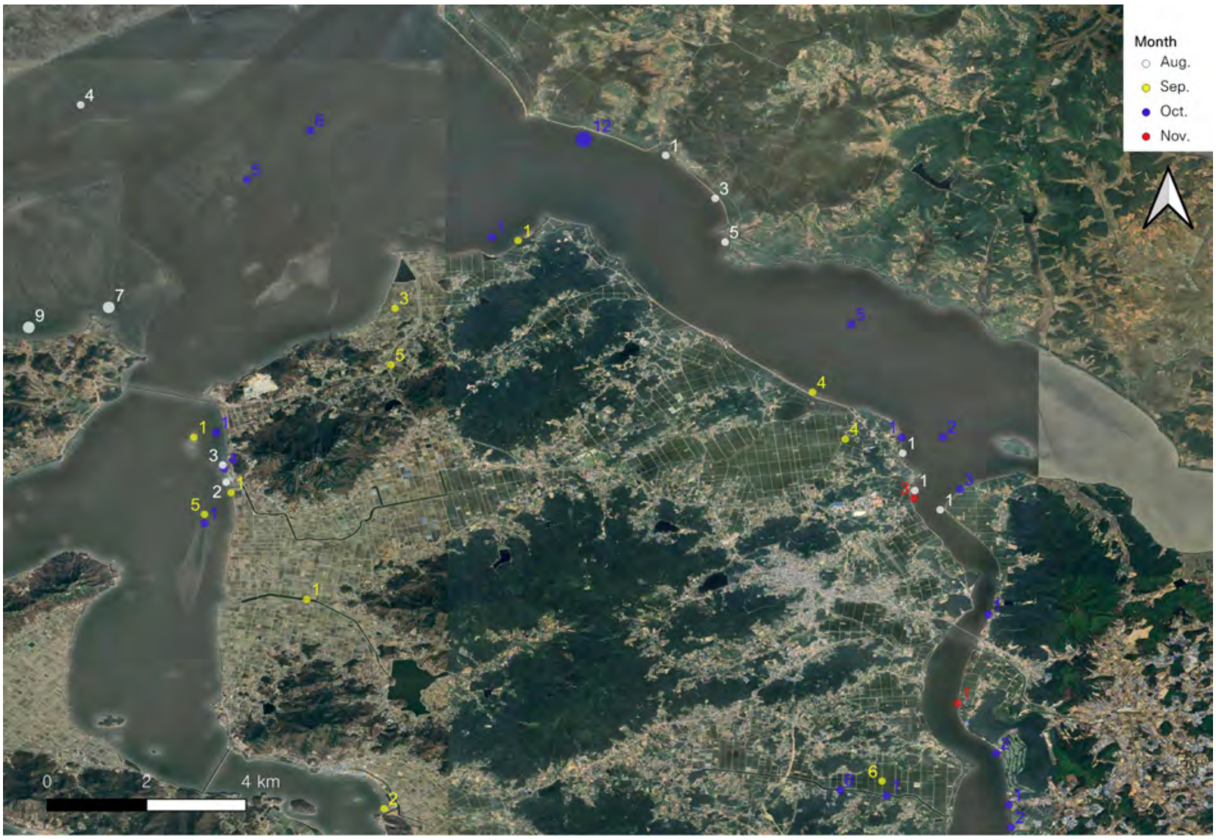


Figure Ⅲ-9. Observation Points in Northern Ganghwa.

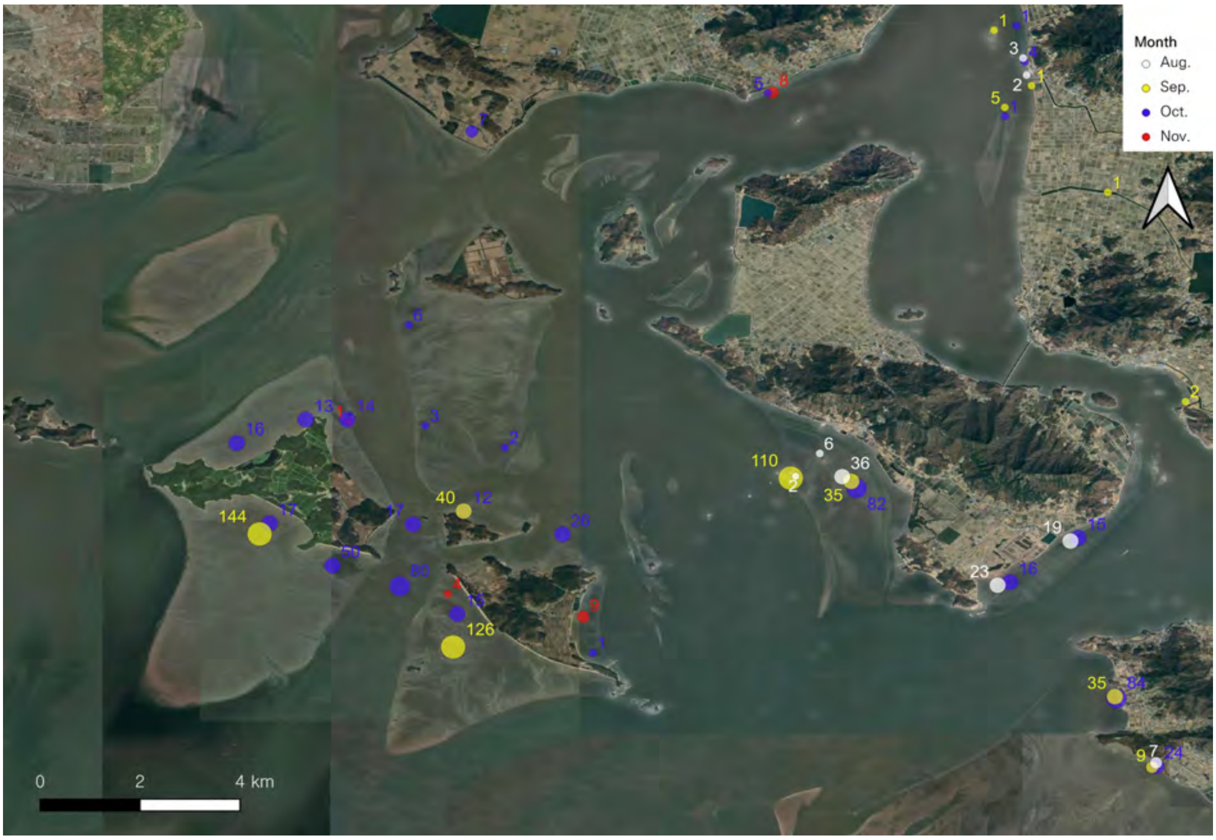


Figure Ⅲ-10. Observation Points in Seokmodo and Seodo, Ganghwa

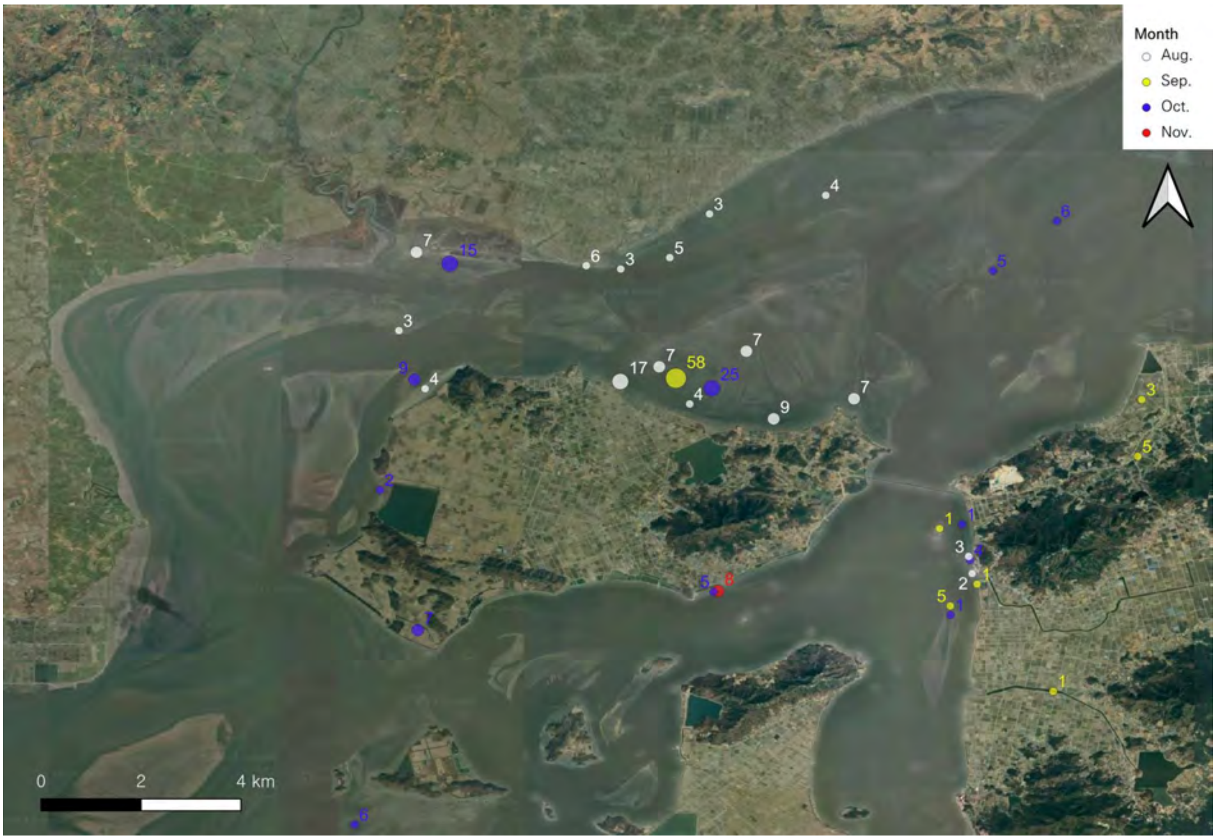


Figure Ⅲ-11. Observation Points in Gyodongdo, Ganghwa.

| Yeongjong Island (Jung-gu, Incheon)

- In the Yeongjongdo area, 471 individuals were observed in August 2024, 399 in September, 372 in October, and 26 in November (Figure II-12).
- Compared to the past five years, the number of observed Black-faced Spoonbills has shown a decreasing trend (Figure III-12). In 2020, 499 individuals were recorded in August, 671 in September, and 405 in October. In 2021, 801 individuals were observed in August, 694 in September, and 632 in October.
  In 2022, the counts were 362 in August, 454 in September, and 234 in October. In 2023, 558 individuals were observed in August, 556 in September, 466 in October, and 22 in November (Figure III-12).
- At Suhaam, a breeding site in northern Yeongjongdo, Black-faced Spoonbills have not attempted to breed since 2023, following a failed breeding attempt in 2022 due to disturbance by predators. At Sinsuhaam (Jeoeo-do), breeding attempts also failed in both 2022 and 2023 due to the presence of Eurasian Eagle-Owls, and although there was disturbance in 2024 as well, a portion of the population succeeded in breeding. In 2024, a new breeding site was confirmed at Janggodo, located at the northern end of Yedampo, suggesting a possible relocation from the previous breeding sites. Additionally, the habitat quality in the area has deteriorated due to development. The resting and foraging sites at the former Hongdae Salt Farm reservoir have been damaged by construction, and the reduction in suitable wetland areas at the 2nd Reclamation Dredged Material Disposal Site has further contributed to the decline in the number of Black-faced Spoonbills in the region compared to previous years (Figure III-13).

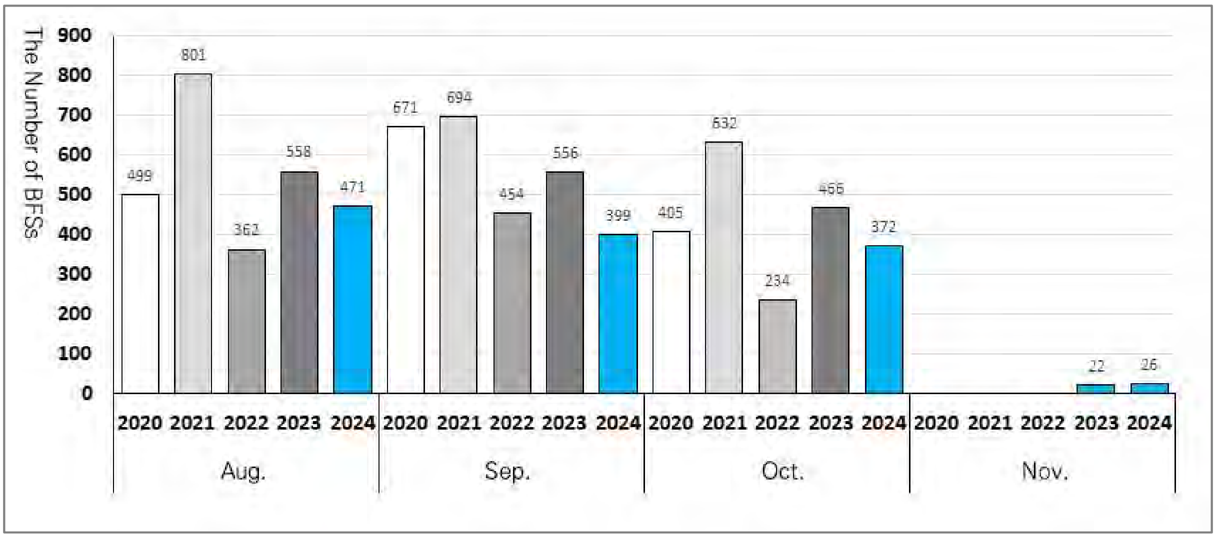


Figure Ⅲ-12. Monthly BFS Counts in Yeongjong Island (Aug 2020–Nov 2024).

- In the Yeongjong Island area, more than 100 Black-faced Spoonbills were observed during the September and October surveys at sites such as the southern tidal flats, Songsan Reservoir, and the Unryeom Island Dredged Spoil Disposal Site. However, in the southern abandoned salt pan area, which had previously recorded over 100 individuals regularly, the number of observed birds decreased significantly in 2024 (Figure III-14).
- In the northern area around Yedanpo, several dozen individuals were also observed. However, due to high tide levels, only a small number of birds used the area for roosting. At Eulwang-ri, dozens of Black-faced Spoonbills were recorded between August and October. In contrast, Sammo Wharf, located in the northernmost part of the island, had water levels too high for foraging or roosting, and no individuals were observed there (Figure III-14).

❙ Bukdo-myeon, Ongjin County (Sin-Jangbong Island Area)

- In the Bukdo-myeon area of Ongjin County, 155 individuals were observed in August 2024, 61 in September, and 78 in October. The survey was not conducted in November due to adverse weather conditions. The number of Black-faced Spoonbills showed a decreasing trend from August to October (Figure III-13).
- Over the past five years, the number of individuals has gradually declined overall. In 2020, 177 individuals were recorded in August, 72 in September, and 73 in October. In 2021, 69 individuals were observed in August, 118 in September, and 101 in October. In 2022, there were 156 individuals in August, 112 in September, and 39 in October. In 2023, 148 individuals were observed in August, 105 in September, 88 in October, and 18 in November (Figure III-13).
- Black-faced Spoonbills were observed across most of the tidal flats in the area, except for the eastern part of Jangbongdo and the southern part of Sindo. Notably, flocks of several dozen individuals were observed on the eastern tidal flats of Sindo, the northern tidal flats of Jangbongdo, and the intertidal area between Sindo and Sido. The lower number of individuals observed during the September survey may have been due to unfavorable weather conditions at the time (Figure III-14).

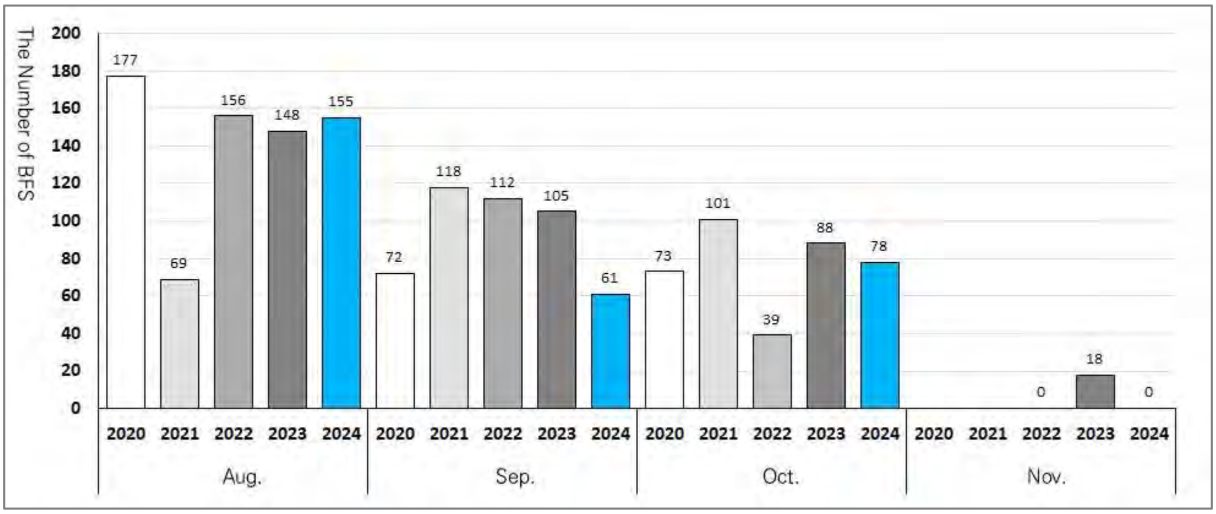


Figure Ⅲ-13. Monthly BFS Counts in Bukdo-myeon, Ongjin (Aug 2020–Nov 2024).

Figure Ⅲ-14. Monthly Observation Points in Yeongjong and Bukdo-myeon (Sindo-Jangbongdo)

❙ Songdo, Incheon (Namdong Reservoir, Songdo Tidal Flats, Siheung Gaetgol Wetland)

- In the Songdo area of Incheon, 222 individuals were observed in August 2024, 189 in September, 198 in October, and 14 in November (Figure III-15).
- Over the past five years, 341 individuals were observed in August 2020, 247 in September, and 72 in October. In 2021, 224 individuals were recorded in August, 156 in September, and 222 in October. In 2022, the counts were 340 in August, 163 in

September, and 88 in October. In 2023, 344 individuals were observed in August, 337 in September, and 249 in October (Figure III–15).

- Although the annual peak numbers of observed Black-faced Spoonbills have not shown drastic variation, the overall number recorded in 2024 declined noticeably. This decrease may be attributed to habitat changes caused by development, the lack of stable high-tide roosting sites, and the possibility that birds migrated earlier to other southern regions as a result (Figure III–16).
- The spoonbills were mainly distributed across most tidal flats in the Songdo area, excluding the deeper western coastal zones such as the Namdong Water Reservoir, Aamdo, and the tidal flats of Songdo Districts 10 and 11, as well as Gojan Tidal Flat. They also utilized nearby wetlands such as Sorae Wetland Ecological Park, Siheung Gaetgol, and inland marshes.
- Namdong Water Reservoir and Hwangsaebawi, both known breeding sites for the species, continued to be used as high-tide roosting areas after the breeding season. However, the use of Namdong Water Reservoir as a roosting site varied depending on fluctuations in water levels (Figure III–16).

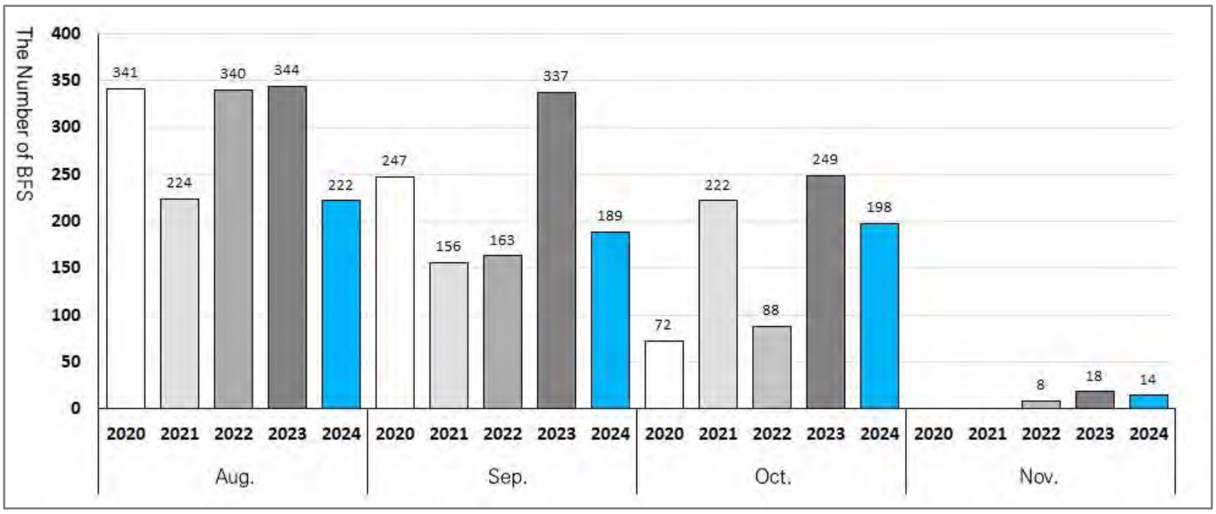


Figure Ⅲ–15. Monthly BFS Counts in Songdo, Incheon (Aug 2020–Nov 2024).

Figure Ⅲ-16. Monthly Observation Points in Songdo, Incheon.

❙ Ansan (Sihwa Lake and Daebu Island)

- In the Ansan area, 640 individuals were recorded in August 2024, 427 in September, 669 in October, and 23 in November (Figure III-17).
- Compared to the past five years, 194 individuals were observed in August 2020, 211 in September, and 152 in October. In 2021, 261 individuals were recorded in August, 300 in September, and 277 in October (Figure III-17).
  In 2022, 395 individuals were observed in August, 510 in September, 121 in October, and 19 in November. In 2023, the numbers increased significantly, with 492 individuals in August, 493 in September, 299 in October, and 8 in November.
- Black-faced Spoonbills were widely distributed along the southern edge of Lake Sihwa, and were primarily observed at the northern rocky coast of Seonjaedo, Geunhaemseom, the southern tidal flats of Daebudo, and the rocky shores around Tando Port (Figure III-18).

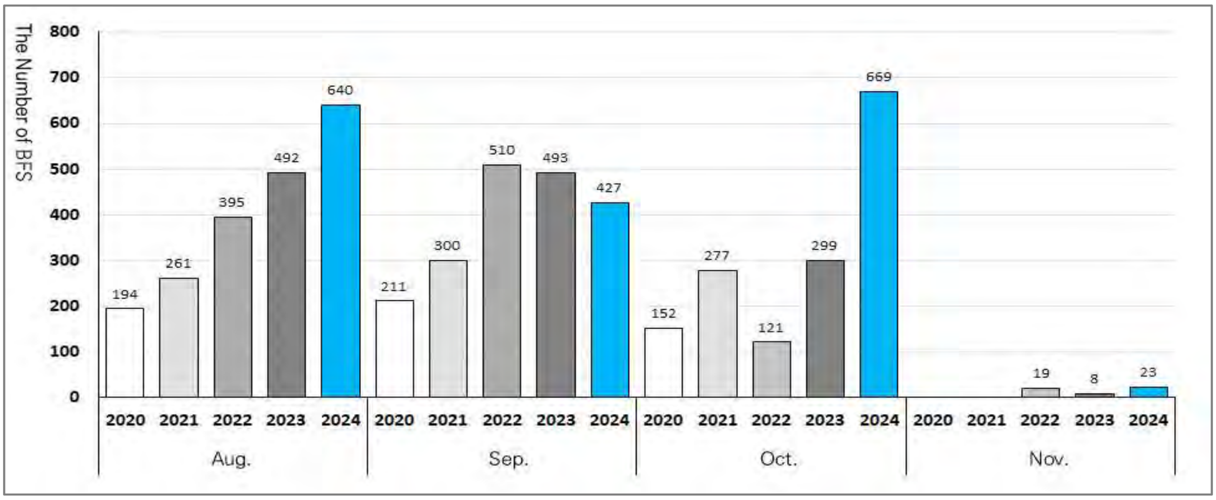


Figure Ⅲ-17. BFS Counts in Ansan (Siwha-Daebu) (Aug 2020-Nov 2024).

Figure Ⅲ-18. Monthly Observation Points in Ansan (Siwha-Daebu).

❙ Hwaseong Tidal Flats (Wetlands)

- In the Hwaseong tidal flats and wetlands, 309 individuals were observed in August 2024, 419 in September, 381 in October, and 32 in November (Figure III-19).
- Over the past five years, the monthly variation was relatively small in 2020, with 221 individuals in August, 277 in September, and 214 in October. In 2021, 280 individuals were recorded in August, 253 in September, and 342 in October. In 2022, 303 individuals were observed in August, 287 in September, and a notable decline to 108 in

October. In 2023, 292 individuals were recorded in August, 298 in September, and 145 in October. In 2024, the peak number of individuals increased significantly across all three months (Figure III-19).

- In the Hwaseong tidal flat area, Black-faced Spoonbills were mainly observed at Maehyang-ri tidal flat, Lake Hwaseong and its inner wetlands, and Seoshin tidal flat. During the September survey, over 200 individuals were observed inside Lake Hwaseong, while over 100 individuals were recorded in Maehyang-ri during the August survey. Additionally, more than 10 individuals were observed in the tidal flats near Goan Port and Gungpyeong Port (Figure III-20).

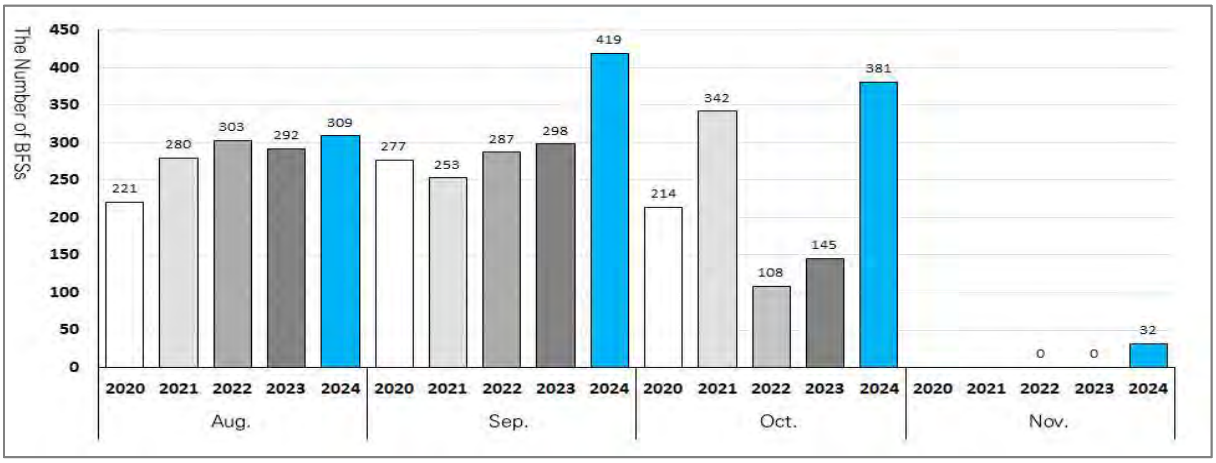


Figure Ⅲ-19. BFS Counts in Hwaseong Tidal Flats (Aug 2020–Nov 2024)

Figure Ⅲ-20. Monthly Observation Points in Hwaseong Tidal Flats.

❙ Asan Bay

- In Asan Bay, 598 individuals were observed in August 2024, 201 in September, 280 in October, and 17 in November (Figure III-21).
- When compared to the past five years, 27 individuals were recorded in August 2020, 216 in September, and 54 in October. In 2021, 168 individuals were observed in August, 269 in September, and 168 in October (Figure III-21). In 2022, the counts were 416 in August, 415 in September, and 66 in October. In 2023, 233 individuals were recorded in August, 269 in September, and 112 in October. The highest number was recorded in August 2024, and the number of observed individuals in both September and October also showed an increasing trend compared to previous years (Figure III-21).
- In the Asan Bay area, the majority of Black-faced Spoonbills were observed at the retention basin within Pyeongtaek Port. Notably, 541 individuals were recorded there in August, suggesting the area serves as both a foraging and roosting site regardless of tidal cycles (Figure III-22). In August 2023, over 100 individuals were observed at the tidal flats in Inju-myeon, Asan City, whereas in 2024, several dozen individuals were recorded during different periods.

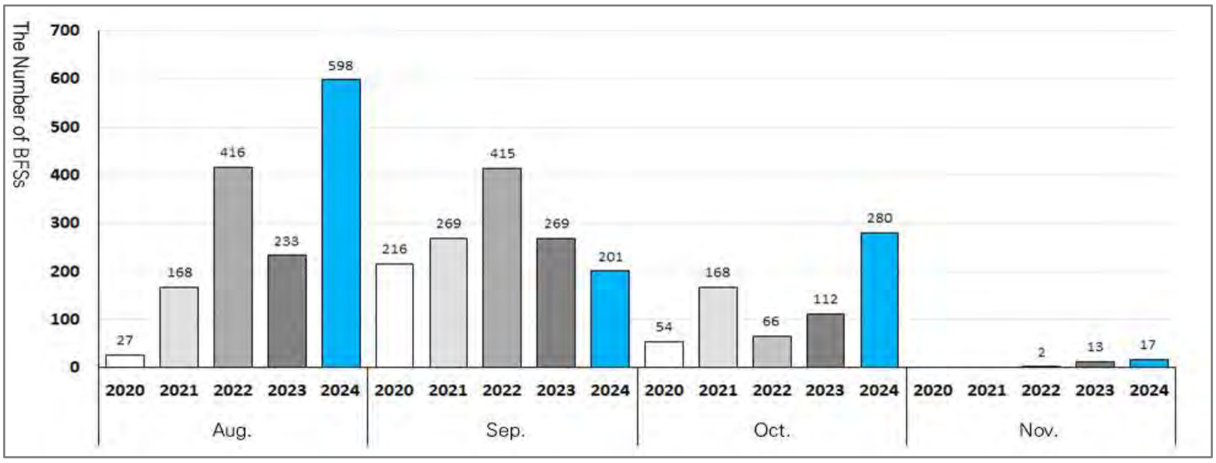


Figure Ⅲ-21. BFS Counts in Asan Bay (Aug 2020–Nov 2024)

Figure Ⅲ-22. Monthly Observation Points in Asan Bay.

❙ Taean, Cheonsu Bay – Boryeong

- In Cheonsu Bay, Taean, and Boryeong, 22 individuals were observed in August 2024, 24 in September, 84 in October, and 3 in November (Figure III-23).
- Over the past five years, no individuals were observed in August 2020, while 20 were recorded in September and 4 in October. In 2021, 32 individuals were observed in August, 2 in September, and 3 in October (Figure III-23). In 2022, 5 individuals were recorded in August, none in September and October, and 3 in November. In 2023, 54 individuals were observed in August, 58 in September, 48 in October, and 7 in November.
- Until 2022, there were no known sites in this region where Black-faced Spoonbills regularly appeared, and the number of individuals observed was low. However, the numbers increased in 2023 and 2024, with a maximum of 58 and 84 individuals observed respectively. This upward trend may indicate an expansion of the species' distribution into this region as part of a broader population increase, though changes in survey range and methodology may also have influenced the results.
- Spoonbills were mainly observed in tidal flats near Daesan-eup in Seosan, the northern

part of Ganwol Lake (including the confluence of the Taeancheon and Dodangcheon streams), the tidal flats around Ocheon Port in Dangjin, the northern tidal flats of Anmyeon-do, and the estuarine tidal flats of Daecheoncheon in Boryeong (Figure III-24).

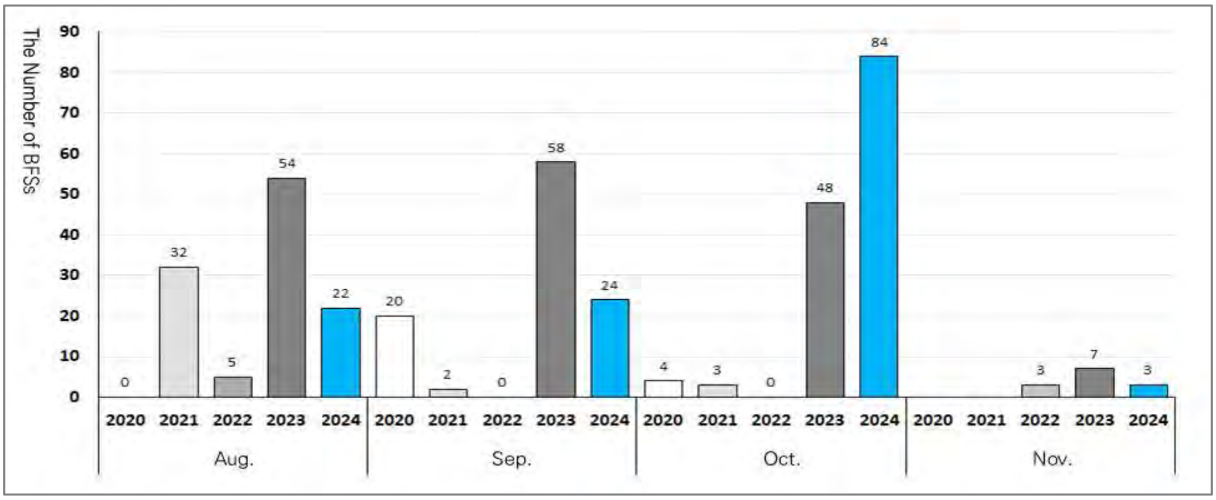


Figure Ⅲ-23. BFS Counts in Taean and Cheonsu Bay (Aug 2020–Nov 2024).

Figure Ⅲ-24. Monthly Observation Points in Taean, Cheonsu Bay–Boryeong.

❙ Yubu Island Area, Seocheon

- In the Yubu Island area of Seocheon, 355 individuals were observed in August 2024, 519 in September, 510 in October, and 63 in November (Figure III–25).
- In 2020, 249 individuals were recorded in August, 190 in September, and 140 in October. In 2021, 351 individuals were observed in August, 488 in September, and 389 in October. In 2022, the numbers were 634 in August, 458 in September, 274 in October, and 37 in November. In 2023, 457 individuals were recorded in August, 507 in September, 362 in October, and 51 in November (Figure III–25).
- The number of observed individuals has been steadily increasing, including during the wintering period in November, indicating a continued upward trend.
- The primary habitat was around Yubu Island, where 80 to 160 individuals were observed, representing a decrease compared to 2022. More than 100 individuals were observed at the Songnim–ri tidal flat, and several dozen spoonbills were also recorded in August and September around the Geum River estuary and the Jangguman area.
- Black–faced Spoonbills in the Seocheon region were observed using a wide range of tidal flats, primarily those in the Jangguman, Songnim–ri, and Janghang areas. During high tide, they used Yubu Island and Geumrando as major roosting sites (Figure III–26).

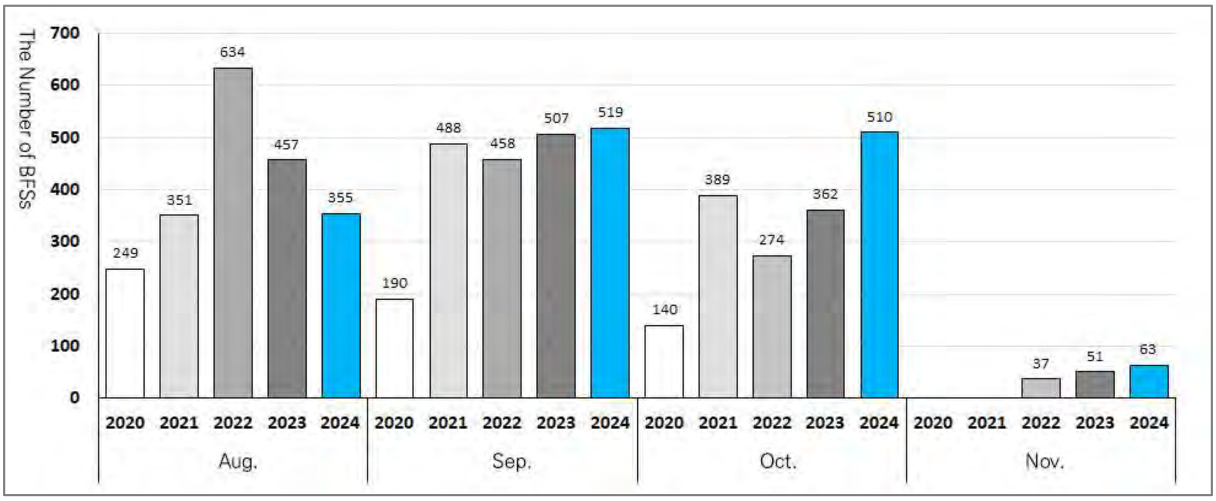


Figure Ⅲ–25. BFS Counts in Yubu Island, Seocheon (Aug 2020–Nov 2024).

Figure Ⅲ-26. Monthly Observation Points in Seocheon and Yubu Island.

❙ Saemangeum

- In the Saemangeum area, 202 individuals were observed in August 2024, 88 in September, 132 in October, and 9 in November (Figure III-27).
- In 2020, 101 individuals were recorded in August, 135 in September, and 72 in October. In 2021, 83 individuals were observed in August, 106 in September, and 128 in October. In 2022, the numbers were 148 in August, 237 in September, 124 in October, and 5 in November. In 2023, 66 individuals were recorded in August, 90 in September, 150 in October, and 14 in November (Figure III-27).
- During the August 2024 survey, approximately 200 Black-faced Spoonbills were recorded around the Mangyeong River estuary. In the following months, several dozen individuals were also observed in the Sura tidal flat and around the estuaries of the Mangyeong and Dongjin Rivers (Figure III-28).

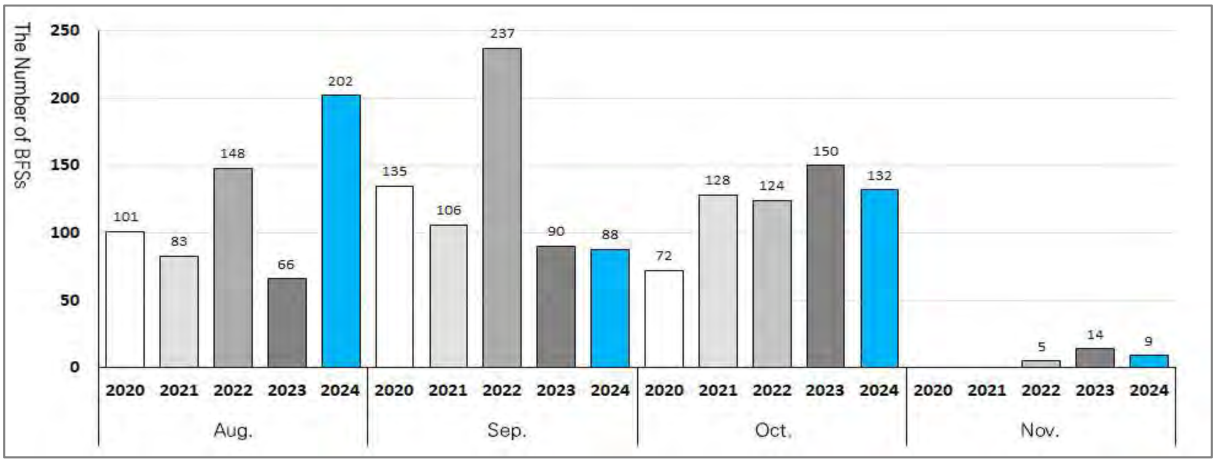


Figure Ⅲ-27. BFS Counts in Saemangeum (Aug 2020–Nov 2024).

Figure Ⅲ-28. Monthly Observation Points in Saemangeum.

❙ Gomso Bay

- In the Gomso Bay area, 188 individuals were observed in August 2024, 131 in September, 231 in October, and 6 in November (Figure III-29).
- Over the past four years, 35 individuals were recorded in August 2020, 64 in September, and 41 in October. In 2021, 36 individuals were observed in August, 49 in September, and 70 in October. In 2022, 32 individuals were recorded in August, 129 in September,

86 in October, and 5 in November. In 2023, the numbers increased significantly to 197 in August, 253 in September, 318 in October, and 5 in November (Figure III–29).

▪ The main habitats used by Black-faced Spoonbills in this area included the estuary of the Galgokcheon Stream and the southern tidal flats. During low tide, the birds were observed widely dispersed throughout the Gomso Bay tidal flats (Figure III–30).

▪ Until 2022, only several dozen individuals were observed in the Gomso Bay area, but since 2023 and continuing into 2024, several hundred individuals have been consistently recorded.

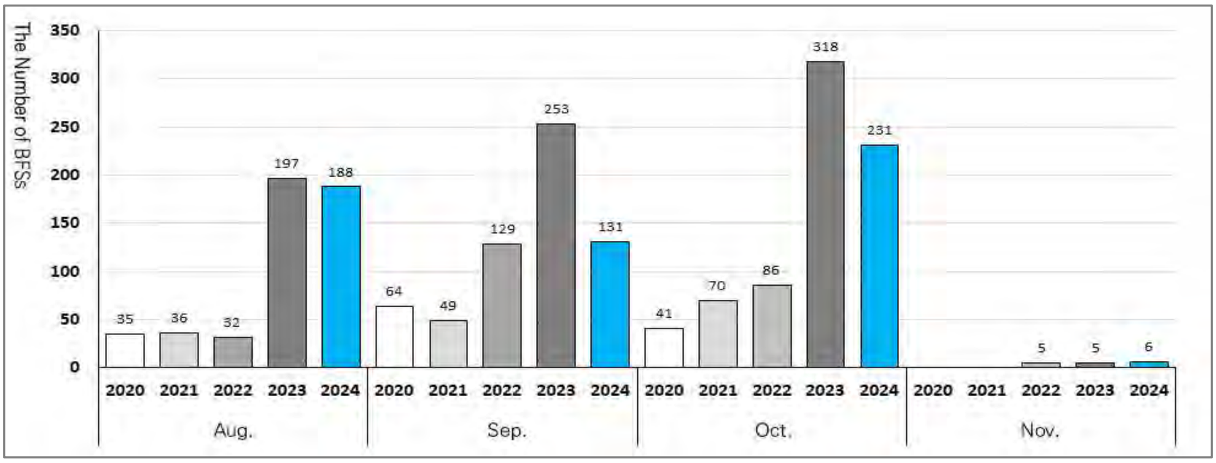


Figure Ⅲ–29. BFS Counts in Gomso Bay (Aug 2020–Nov 2024).

Figure Ⅲ–30. Monthly Observation Points in Gomso Bay.

Yeonggwang Tidal Flats

- In the Yeonggwang tidal flat, 860 individuals were observed in August 2024, 1,085 in September, 588 in October, and 86 in November (Figure III–31). This site recorded the highest number of Black-faced Spoonbills among the 20 surveyed regions. Notably, more than 1,000 individuals were observed in September for the first time since monitoring began.
- Over the past five years, 736 individuals were observed in August 2020, 688 in September, and 545 in October. In 2021, 827 individuals were recorded in August, 913 in September, and 849 in October. In 2022, the counts were 584 in August, 925 in September, 446 in October, and 20 in November. In 2023, 810 individuals were recorded in August, 996 in September, 548 in October, and 40 in November (Figure III–31).
- Several hundred individuals have been consistently observed in the Baeksu tidal flat, the tidal flats near Hasari and the estuary of the Bulgabcheon Stream, and in adjacent abandoned salt pans and wetlands. Additionally, several dozen spoonbills were recorded near Beopseongpo (Figure III–32).

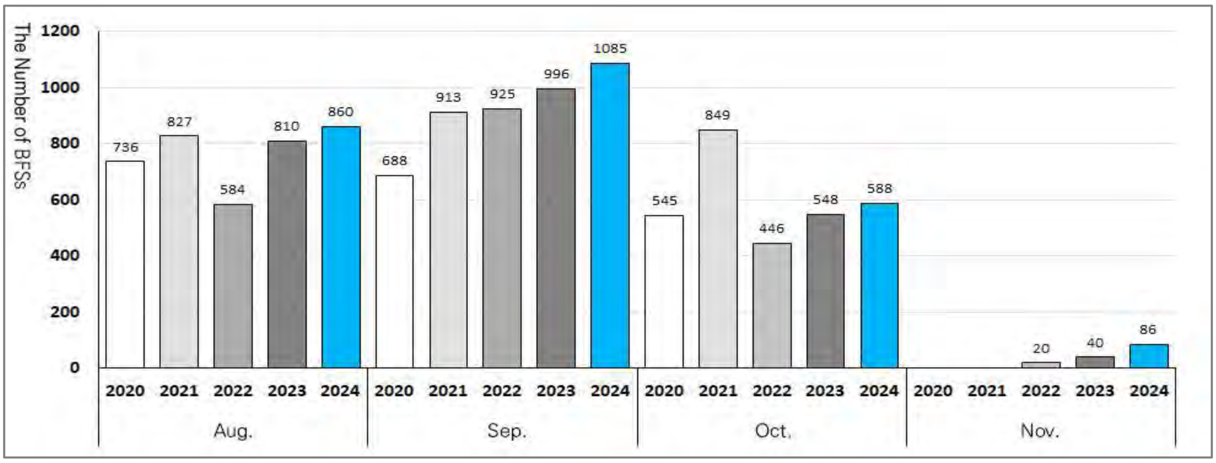


Figure Ⅲ–31. BFS Counts in Yeonggwang Tidal Flats (Aug 2020–Nov 2024).

Figure Ⅲ-32. Monthly Observation Points in Yeonggwang Tidal Flats.

❙ Muan-Shinan Tidal Flats

- In the Muan and Shinan area, 63 individuals were observed in August 2024, 97 in September, 109 in October, and 10 in November (Figure III-33).
- Over the past five years, 2 individuals were recorded in August 2020, 7 in September, and 9 in October. In 2021, only 1 individual was observed in August, 3 in September, and 7 in October. In 2022, 20 individuals were recorded in August, 26 in September, 50 in October, and 13 in November. In 2023, the numbers increased significantly to 102 in August, 61 in September, 136 in October, and 1 in November (Figure III-33).
- By region, dozens of individuals were consistently observed from August to October in the southern tidal flats of Aphaedo. Black-faced Spoonbills were also continuously recorded in the northern tidal flats of Haejemyeon in Muan and the western tidal flats of Jeungdo (Figure III-34).
- The number of observed individuals has increased significantly since 2022, and observations during the wintering period in November have also become more consistent.

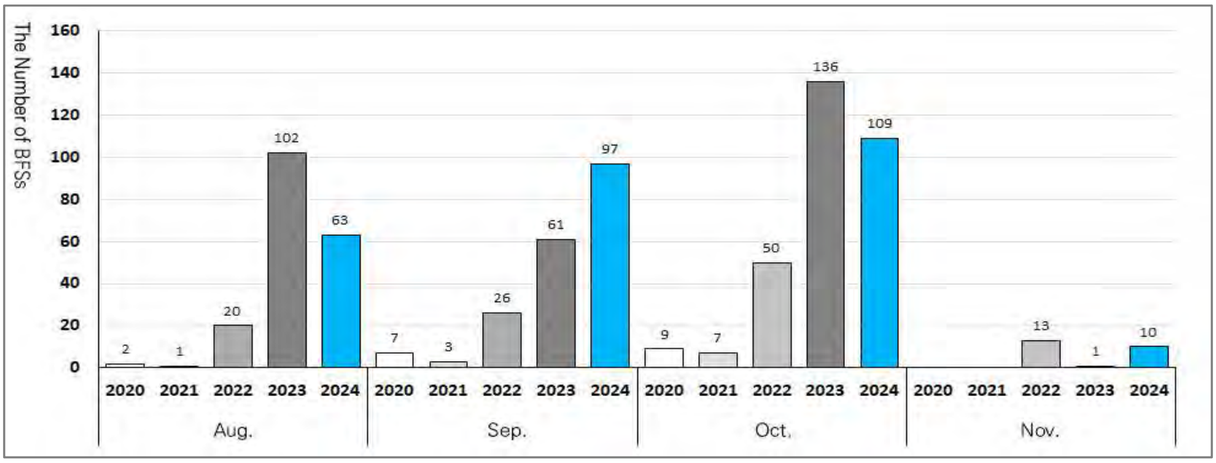


Figure Ⅲ-33. BFS Counts in Muan-Shinan (Aug 2020-Nov 2024).

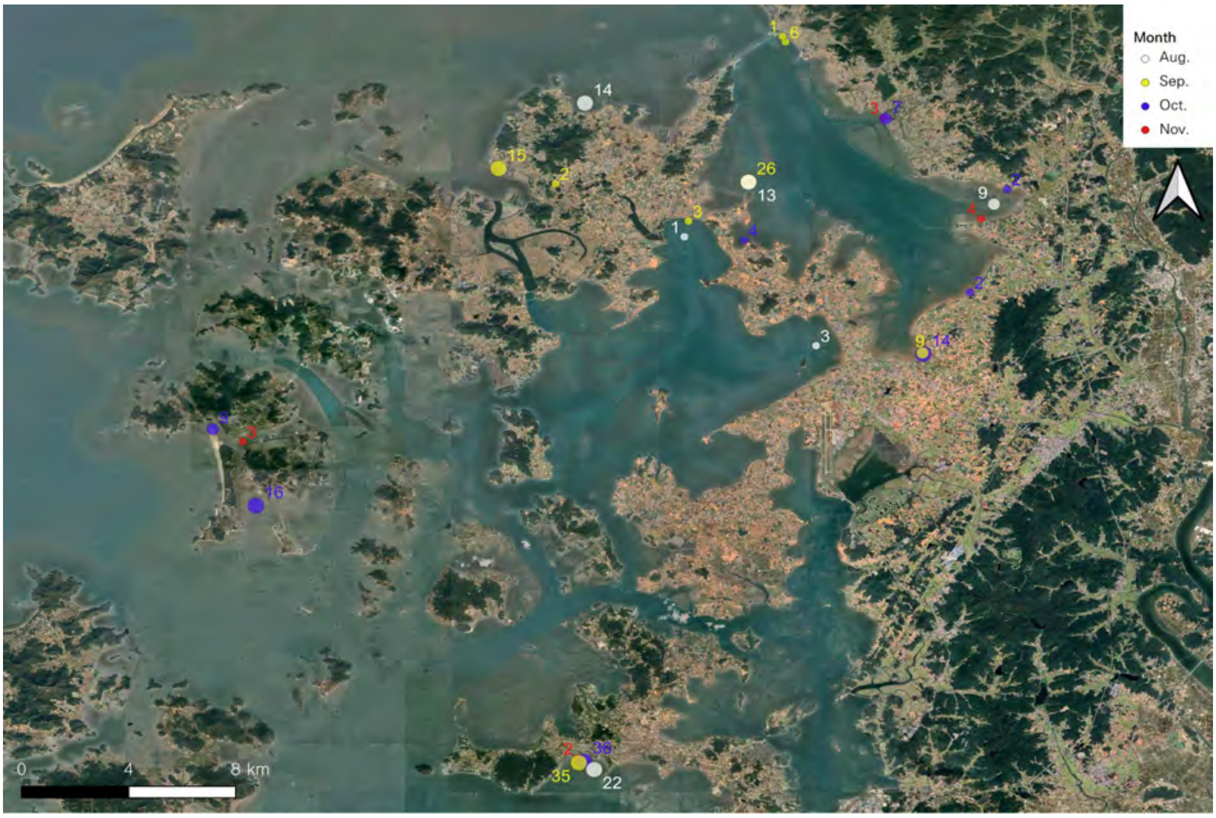


Figure Ⅲ-34. Monthly Observation Points in Muan-Shinan.

❙ Suncheon Bay – Yeosu

- In areas such as Suncheon Bay and Gangjin Bay, 2 individuals were observed in August 2024, 11 in September, 18 in October, and 19 in November (Figure III-35).
- Over the past four years, 16 individuals were recorded in August 2020, 73 in September, and 15 in October. In 2021, 23 individuals were observed in August, 17 in September, and 10 in October. In 2022, 9 individuals were recorded in August, 10 in September, 7 in October, and 14 in November. In 2023, 3 individuals were observed in August, 17 in

September, 17 in October, and 4 in November (Figure III-35).

- In the Suncheon Bay area, no large flocks of Black-faced Spoonbills were observed. Instead, small groups of fewer than 10 individuals were recorded near Sagido, Samgando, Jangyang Port, and Yongdu Port (Figure III-36).

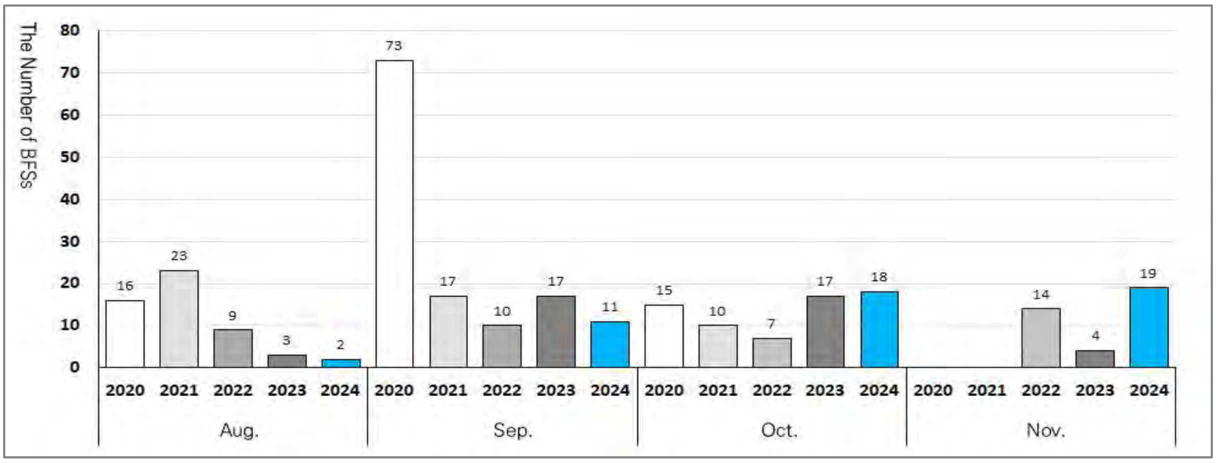


Figure Ⅲ-35. BFS Counts in Suncheon Bay-Yeosu (Aug 2020-Nov 2024).

Figure Ⅲ-36. Monthly Observation Points in Suncheon-Yeosu.

| Haenam – Jin Island

- In the Haenam and Jindo regions, the highest number of individuals was observed in September and October. In 2024, 34 individuals were recorded in August, 92 in September, 81 in October, and 5 in November (Figure III-37).

▪ Surveys in the Haenam area were first conducted in 2022. During that year, 23 individuals were observed in August, 34 in September, 72 in October, and 7 in November. In 2023, 21 individuals were recorded in August, 87 in September, 107 in October, and 6 in November (Figure III–37).

▪ By region, the largest number of individuals was recorded in the mudflats near Gocheonam Lake in Haenam from August to November, which was similar to the 2023 distribution of Black-faced Spoonbills. In addition, a small number of individuals were also observed around Gangjin Bay (Figure III–38).

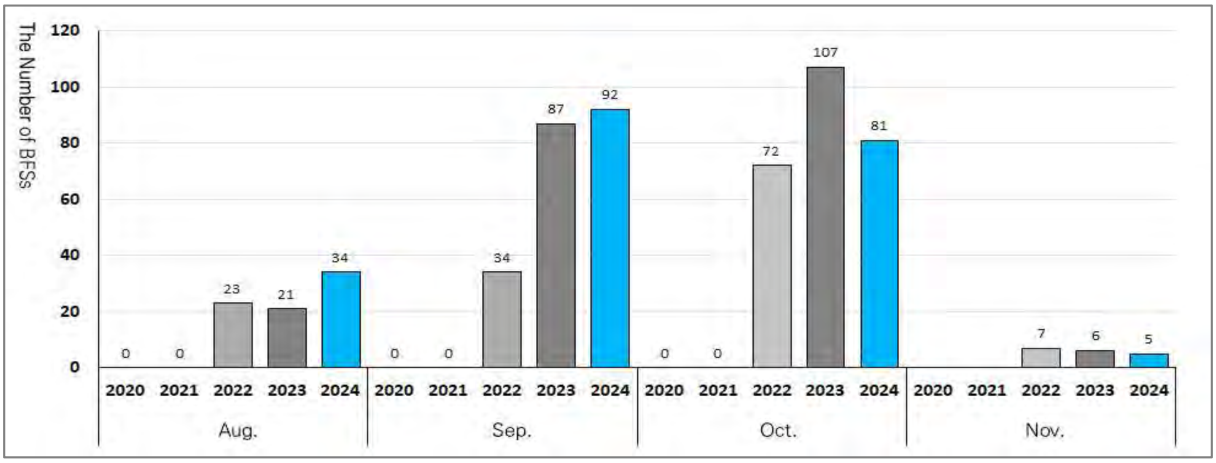


Figure Ⅲ–37. BFS Counts in Haenam–Jindo (Aug 2020–Nov 2024).

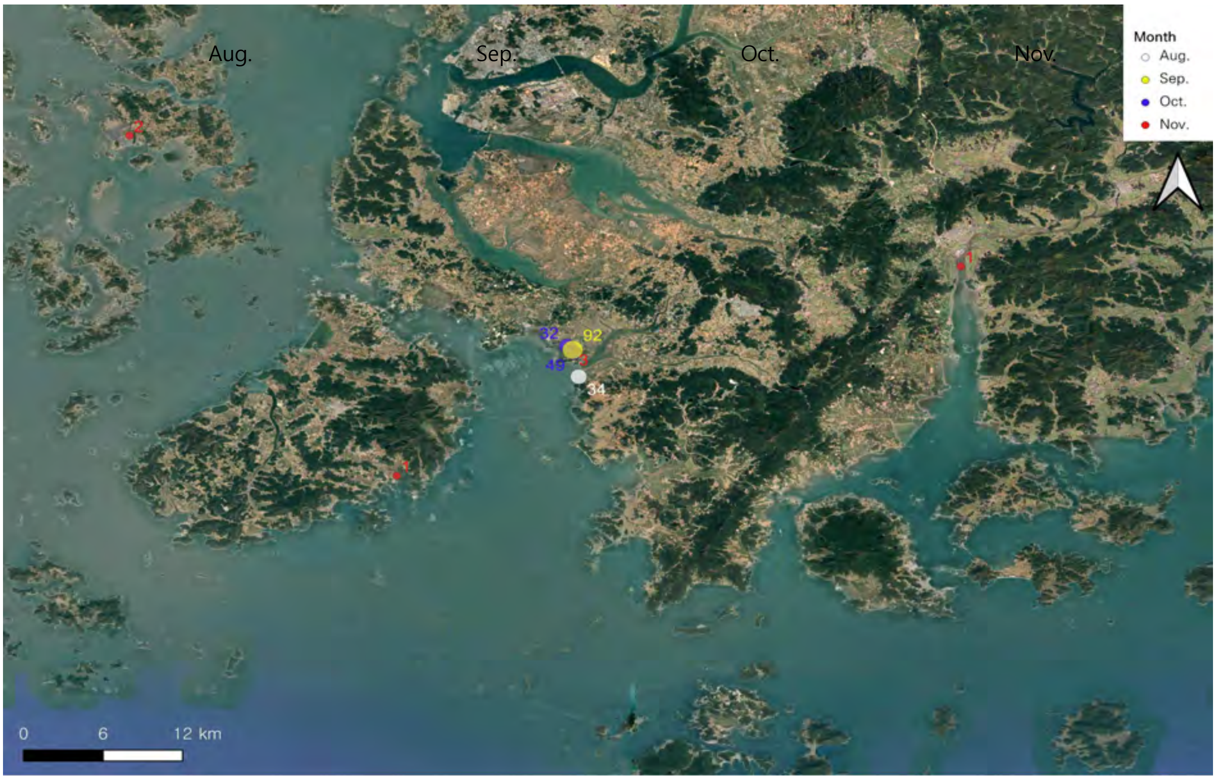


Figure Ⅲ–38. Monthly Observation Points in Haenam–Jindo (incl. Gangjin Bay).

❙ Jeju Island

- In the Jeju Island area, no individuals were recorded in August and September 2024, while 1 individual was observed in October and 30 in November (Figure III-39).
- Over the past five years, 12 individuals were recorded in October 2020 and none in November. In 2022, 3 individuals were observed in August, 4 in September, 24 in October, and 38 in November. In 2023, 6 individuals were recorded in October and 30 in November (Figure III-39).
- Prior to the onset of migration, the number of Black-faced Spoonbills was very low or none at all. However, during the migration and wintering period starting in October, the number of observed individuals increased.
- By region, most of the individuals were observed around Hadori and Jongdalli, while fewer than five individuals were recorded in the eastern Yongsuri area. This result is consistent with the 2023 survey (Figure III-40).

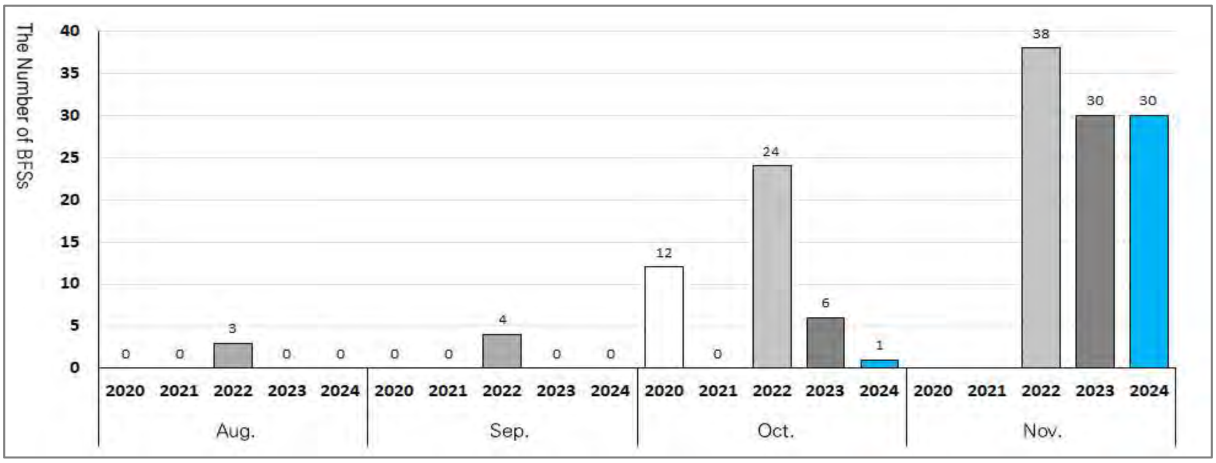


Figure Ⅲ-39. BFS Counts in Jeju Island (Aug 2020–Nov 2024).

Figure Ⅲ-40. Monthly Observation Points in Jeju Island.

C. Leg Band Observation Results

❙ Overall Findings

- A total of 111 leg bands were observed at Black-faced Spoonbill habitats in Korea between August and November 2024. Of these, 100 individuals had been banded in Korea, 10 in Taiwan, and 1 in Hong Kong. The highest resighting rate was for individuals born at the Namdong Reservoir (21 individuals, 18.9%), followed by Maedo (13 individuals, 11.7%), Gaksiam (12 individuals, 10.8%), and Hwangseodo (10 individuals, 9.0%). Among those banded on the four islands of Chilsando, a total of 20 individuals (18.0%) were resighted: 2 from Ilsando (1.8%), 7 from Samsando (6.3%), 7 from Sasando (6.3%), and 4 from Yuksando (3.6%). A total of 25 juveniles born in 2024 were resighted, accounting for 22.5% of all individuals observed (Table III-5).

Table Ⅲ-5. Summary of Colour-banded BFS Observed in Korea (Aug. -Nov. 2024)

Tagging Location	Number	Percentage	Leg band
Gujido	0		-
Bido	1	0.9%	V31
Sangyeo Rock	1	0.9%	V73
Seomando	2	1.8%	S06, SX1
Gaksiam	12	10.8%	E26, E37, E61, H53, H54, V22, V23, Y29, 47K, 62E, 63E, 67E
Maedo	13	11.7%	H66, H88, H90, V27, K20, K34, M06, M08, 19K, 21K, 40E, 56E, 57E
Suhaam	7	6.3%	K79, E02, E94, S39, S58, S00, H70
Yeongjong Jeoeodo	1	0.9%	R29
Namdong Reservoir	21	18.9%	K94, E66, E92, S88, S90, Y63, Y67, Y70, M61, M67, 01K, 06K, 64K, 10E, 77E, 82E, 83E, 84E, R19, R20, R21
Okgwido	5	4.5%	M05, 06E, 68E, 70E, 73E
Hwangseodo	10	9.0%	V47, V52, X97, Y48, 32K, 22E, 28E, 97E, R05, R06
Noruseom	6	5.4%	Y87, Y88, R07, R10, R11, R13
Illsando	2	1.8%	89E, 96E
Samsando	7	6.3%	E42, K30, K31, K32, M56, 88K, 90K
Sasando	7	6.3%	S18, V13, V15, V17, 91K, 95K, 98K
Yuksando	4	3.6%	E76, S13, V95, V98
Gujo	1	0.9%	H01
Taiwan	10	9.0%	T52, T85, T90, T99, N08, N44, N53, N85, N89, N99
Hong Kong	1	0.9%	A42
Total	111	100%	

❙ Banding Site – Resighting Site Patterns

- In 2024, the area with the highest number of banded Black-faced Spoonbill sightings was the Sihwa, Daebu, and Hwaseong Wetlands region, where a total of 32 individuals were recorded. Although this area does not contain known breeding sites, its extensive wetlands provide abundant foraging opportunities, making it an ideal staging area before the birds migrate to their wintering grounds (Table III-6).
- In most locations, birds were most frequently resighted near their original banding (breeding) sites, reflecting the species' strong natal site fidelity—the tendency to return to their birthplace for breeding.
- In southern regions such as Shinan, Suncheon, Haenam, and Jeju, banded birds were observed less frequently, but included individuals originating from a wide variety of locations (e.g., K30, 32K, 06E). This pattern suggests that immature birds often remain at intermediate stopover sites or stay in Korea due to lack of migratory experience or incomplete development of migratory behavior. Among the birds observed in the south, two older individuals (S06 and H54) were seen in Jeju, indicating that more mature birds may be using the island as a wintering site.

Table Ⅲ-6. Relationship between Banding Sites and Resighting Locations of BFS (Aug–Nov 2024)

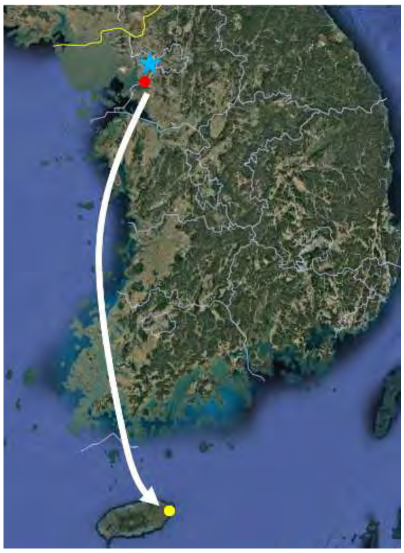
Banding Site	Resighting Region							
	Gangwha	Yeongjong	Songdo	Sihwa, Daebu, Hwaseong	Assan	Seocheon	Yeonggwang	Shinan, Suncheon, Haenam, Jeju
Gujido								
Bido							1	
Sangyeobawi	1							
Seomando		1					1	1
Gaksiam	6		1	2	2	1		1
Maedo	1	7		5				
Suhaam		5						
Yeongjong Jeoeodo		1						
Namdong Reservoir			8	14	2		1	
Okgwido	1			1	3			1
Hwangseodo				8	1			1
Noruseom			1	1	1	2		
Ilsando							2	
Samsando						1	5	1

Sasando							7	
Yuksando					1		3	
Gujo			1					
Taiwan			1		2	2	6	
Hong Kong				1				
Total	9	14	12	32	12	9	28	5

▪ During the monitoring period, several individuals were resighted more than once. Most of them showed a southward movement, including E92 (Songdo in September → Gunsan in October), S06 (Sindo in September → Jeju in November), H54 (Songdo in September → Jeju in November), R21 (Songdo in August → Sihwa in October), and T90 (Pyeongtaek in August → Yeonggwang in October). However, in the case of R11, which was banded at Noruseom in Seocheon in June 2024, the bird was observed in Boryeong in September and then at Sihwa Lake in October, indicating a northward movement (Figure III-41).

E92 (born at Namdong Reservoir)
Songdo in Sep → Geumrando in Oct

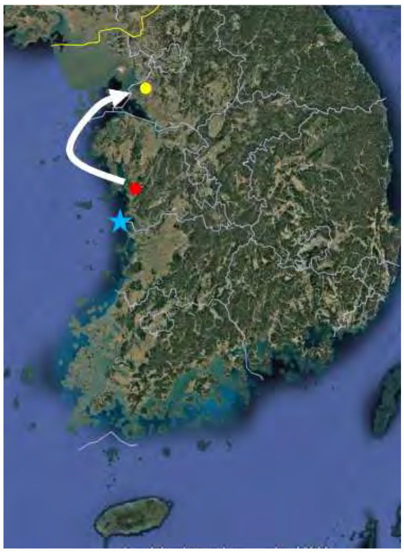
S06 (born at Seomando)
Sindo in Sep → Jeju in Nov



H54 (born at Gaksiam, bred at Namdong Reservoir)
Songdo in Sep → Jeju in Nov

R21 (born at Namdong Reservoir)
Namdong in Aug → Sihwa in Oct

T90 (bred at Gujido)
Pyeongtaek in Aug → Yeonggwang in Oct



R11 (born at Noruseom)
Boryeong in Sep → Sihwa in Oct

Figure Ⅲ-41. Migration Routes of Re-sighted Individuals during the Monitoring Period.

D. Satellite Tracking Results

❙ Overall Migration Summary

- Among the 19 Black-faced Spoonbills being tracked in 2024, by the end of November, 10 individuals had migrated from Korea to China, 5 to Taiwan, and 3 to Kyushu, Japan, while 1 individual remained in the southern region of Korea (Figure III-42). Individuals that crossed the Yellow Sea generally departed from three major coastal regions: the inter-Korean border area, Incheon-Gyeonggi Bay, and the Yeonggwang-Shinan area. After arriving on the eastern coast of China, they continued migrating southward along the coastline. Those that migrated to Japan crossed the southern sea to Kyushu after passing through the inland areas of Jeolla Province.

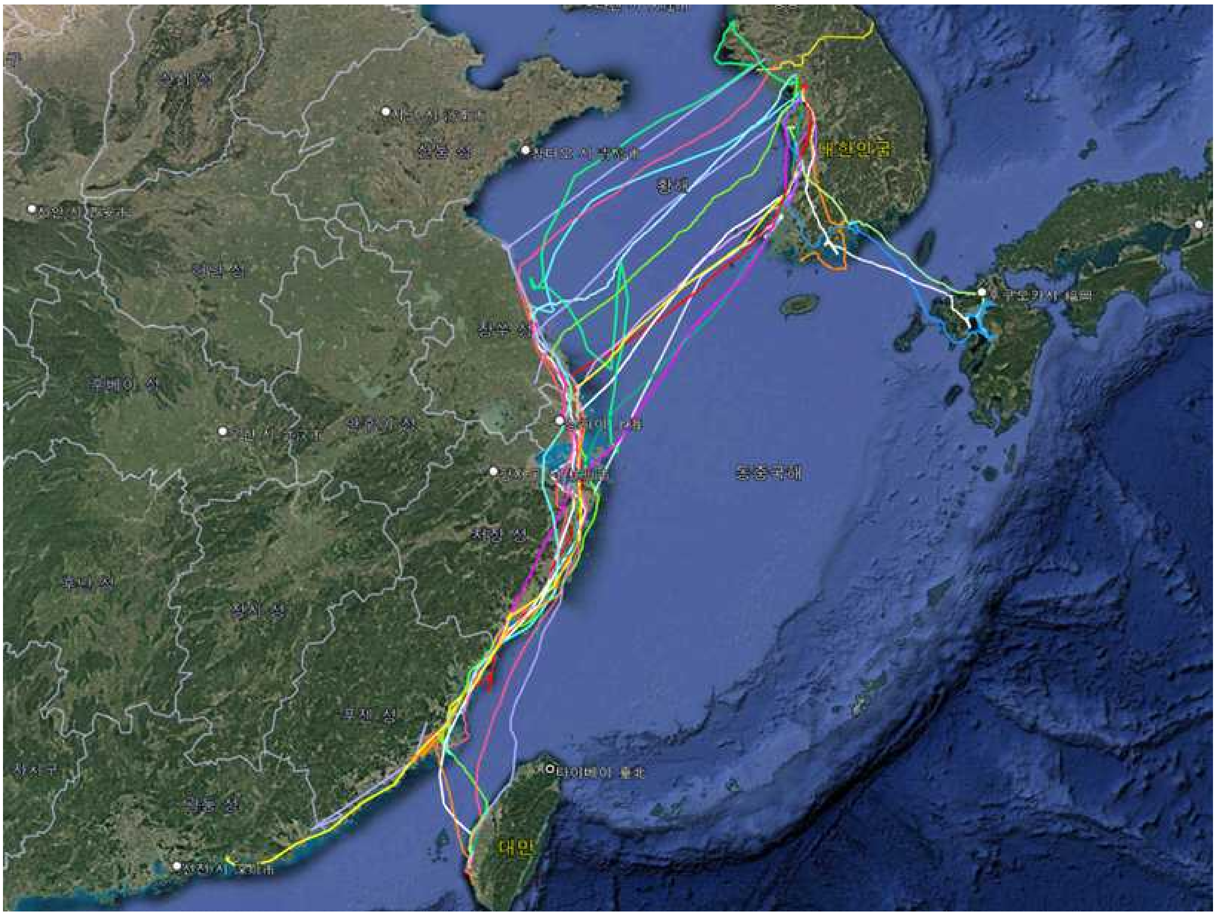


Figure Ⅲ-42. Autumn Migration Routes of BFS from Breeding to Wintering Sites (2024)

Ganghwa and Yeongjong Region

- Four tracked Black-faced Spoonbills (M10, M17, 66E, R27) in the Ganghwa and Yeongjong region were observed foraging in the tidal flats of Seondu-ri, Dongmak-ri, and Heungwang-ri at the southern tip of Ganghwa Island, while using Gaksiam, Yeochari freshwater pools, and the stone embankments of Seondu-ri as roosting sites.
- In Yeongjong Island, they utilized Section 2 of the Second Dredged Spoil Disposal Site and the tidal flats between the disposal site and Jungsan-dong in Yeongjong for both foraging and resting (Figure III-43).

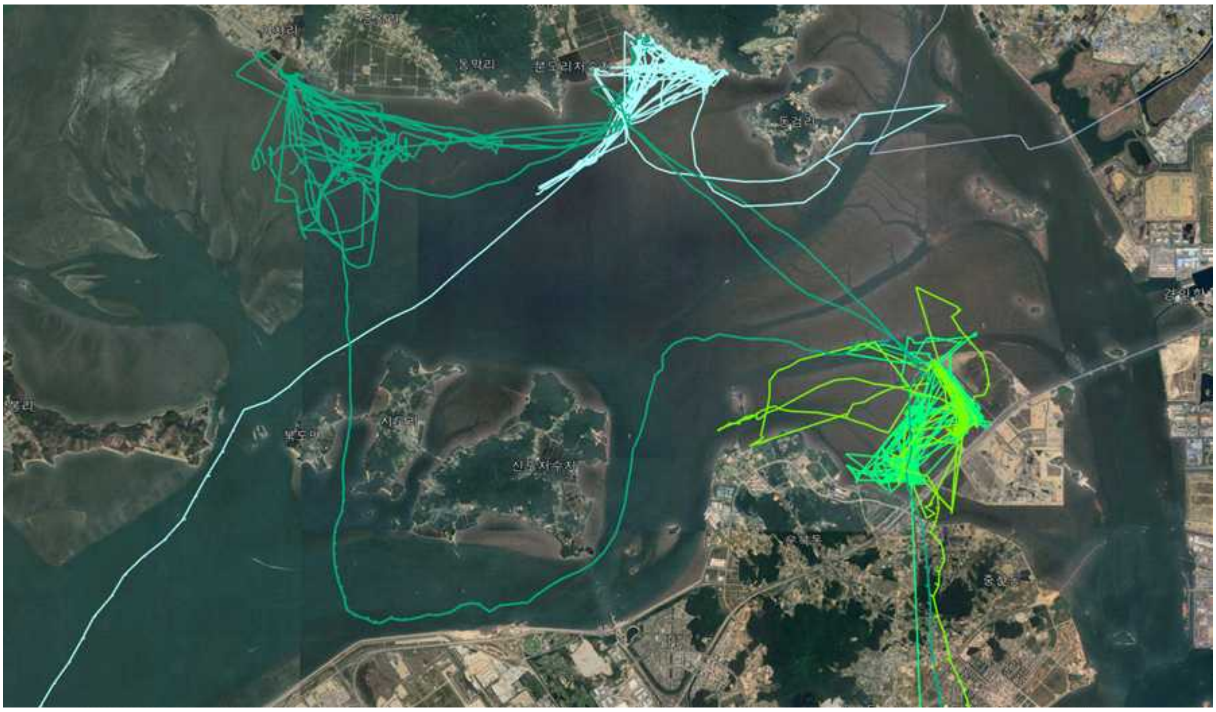


Figure Ⅲ-43. Tracking Data for BFS in Ganghwa and Yeongjong Areas (Oct–Nov 2024)

❙ Songdo and Siheung Region

- Three tracked Black-faced Spoonbills (71E, 75E, 80E) in the Songdo and Siheung region used Namdong Reservoir, Okgwido, and temporary wetlands within the under-development Zones 11-1 and 11-2 as roosting sites. They also utilized the Waterfront Lake (Art Center Reservoir) and the tidal flats in Zone 10 for both foraging and resting (Figure III-44).

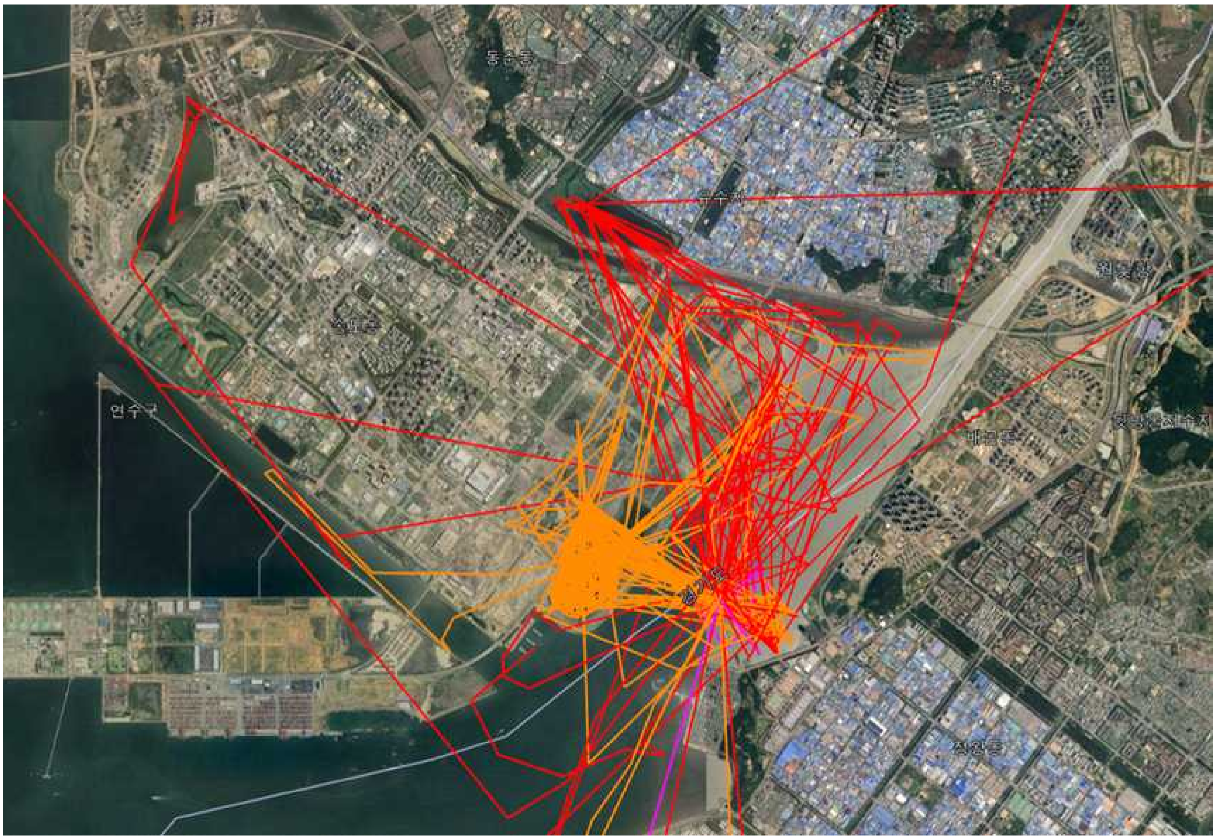


Figure Ⅲ-44. Tracking Data for BFS in Songdo and Siheung Areas (Oct-Nov 2024)

❙ Sihwa Lake and Daebudo Region

- Four tracked Black-faced Spoonbills (M06, 19K, 77E, R19) in the Sihwa Lake and Daebudo area primarily used the Dasong Wetlands (Zones B and D) and the tidal flats around Geunhaemseom as their main habitats (Figure III-45).

Figure Ⅲ-45. Tracking Data for BFS in Siwha and Daebu Area (Oct-Nov 2024).

❙ Asan Bay Region

- One tracked Black-faced Spoonbill (68E) in the Asan Bay region utilized a wide range of sites including the Pyeongtaek Port Reservoir, Geolmaeri Reservoir, Sapgyo Embankment, tidal flats near the Sapgyo Lake Tourist Complex, and the lower section of the Gokgyocheon Stream. The bird remained in Asan Bay until temperatures dropped, then migrated to the Guamcheon area in Yeonggwang, Jeollanam-do in early January 2025 (Figure III-46).

Figure Ⅲ-46. Tracking Data for BFS in Asan Bay (Oct–Nov 2024).

❙ Seocheon Region

- One tracked Black-faced Spoonbill (R09) in the Seocheon area foraged in the tidal flats of Yubu Island and used Geomeunyeo and Myeongamyeo as roosting sites. The bird exhibited a relatively small home range of approximately 10 km² (Figure III-47).

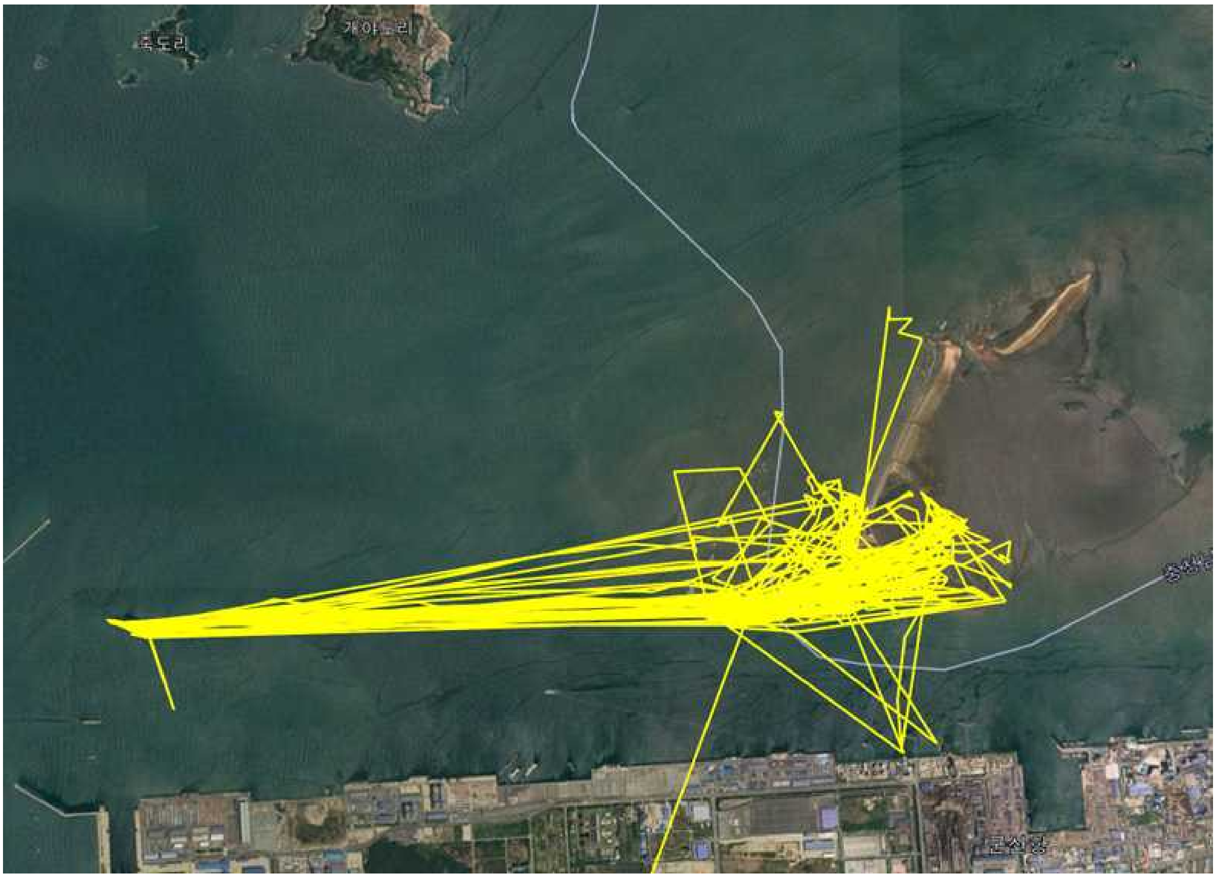


Figure Ⅲ-47. Tracking Data for BFS in Seocheon Area (Oct–Nov 2024).

❙ Yeonggwang Region

- Four tracked Black-faced Spoonbills (M06, 68E, 71E, 89E) in the Yeonggwang area made extensive use of various sites, including the Beopseongpo tidal flats, lower Guamcheon Stream, Baeksu tidal flats (Sangsari and Hasari), Yeomsan-myeon tidal flats, Bulgapcheon Estuary, and abandoned salt pans and wetlands around Hasari (Figure III-48). Additionally, the area located 3–5 km north of Chilsando and Danoindo was identified as part of the southward migratory route for the species.

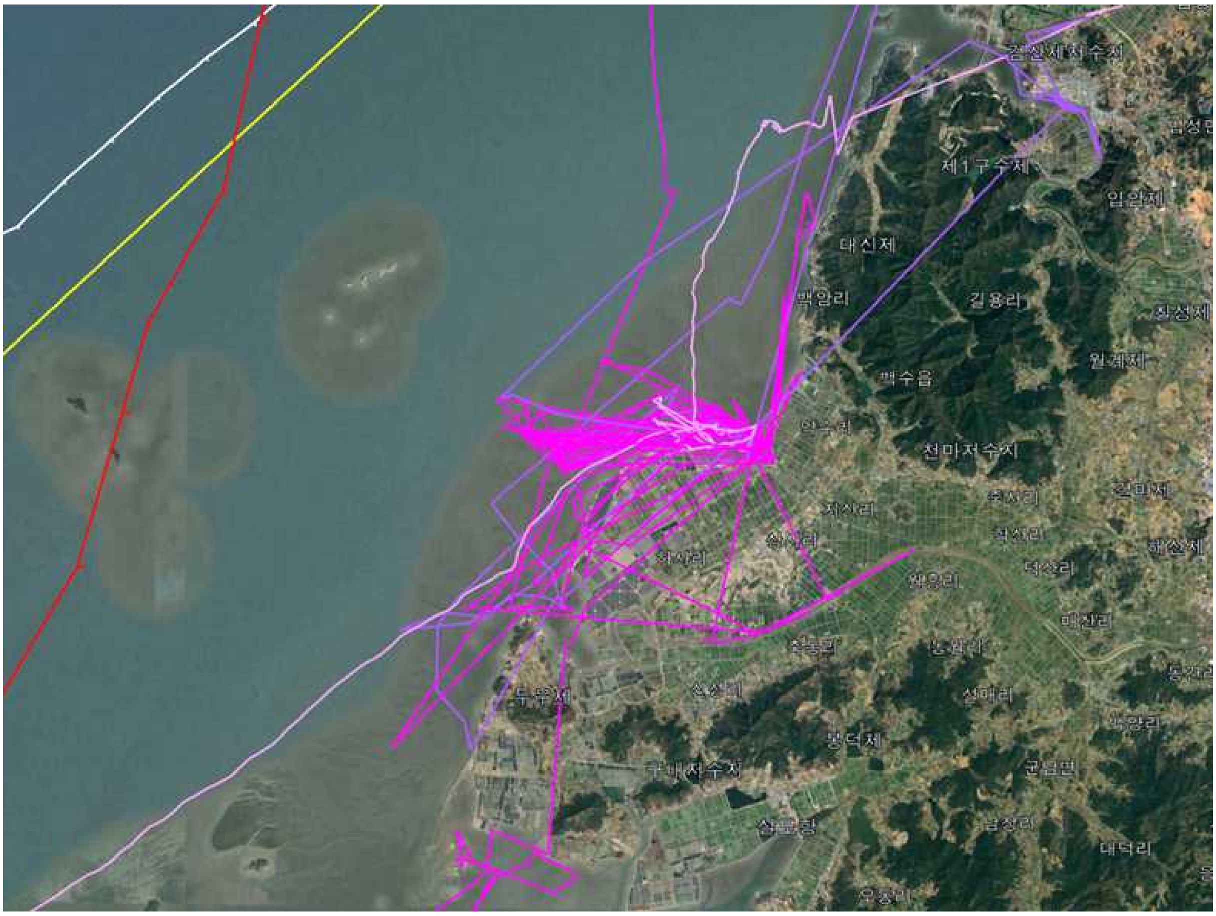


Figure Ⅲ-48. Tracking Data for BFS in Yeonggwang Area (Oct–Nov 2024).

Shinan Region

- One tracked Black-faced Spoonbill (32K) in the Shinan region primarily utilized the tidal flats of Jeung Island. Shinan appears to function not only as a local habitat but also as a migratory corridor for individuals breeding in the Chungcheong and Jeolla regions as they travel to their wintering grounds (Figure III-49).

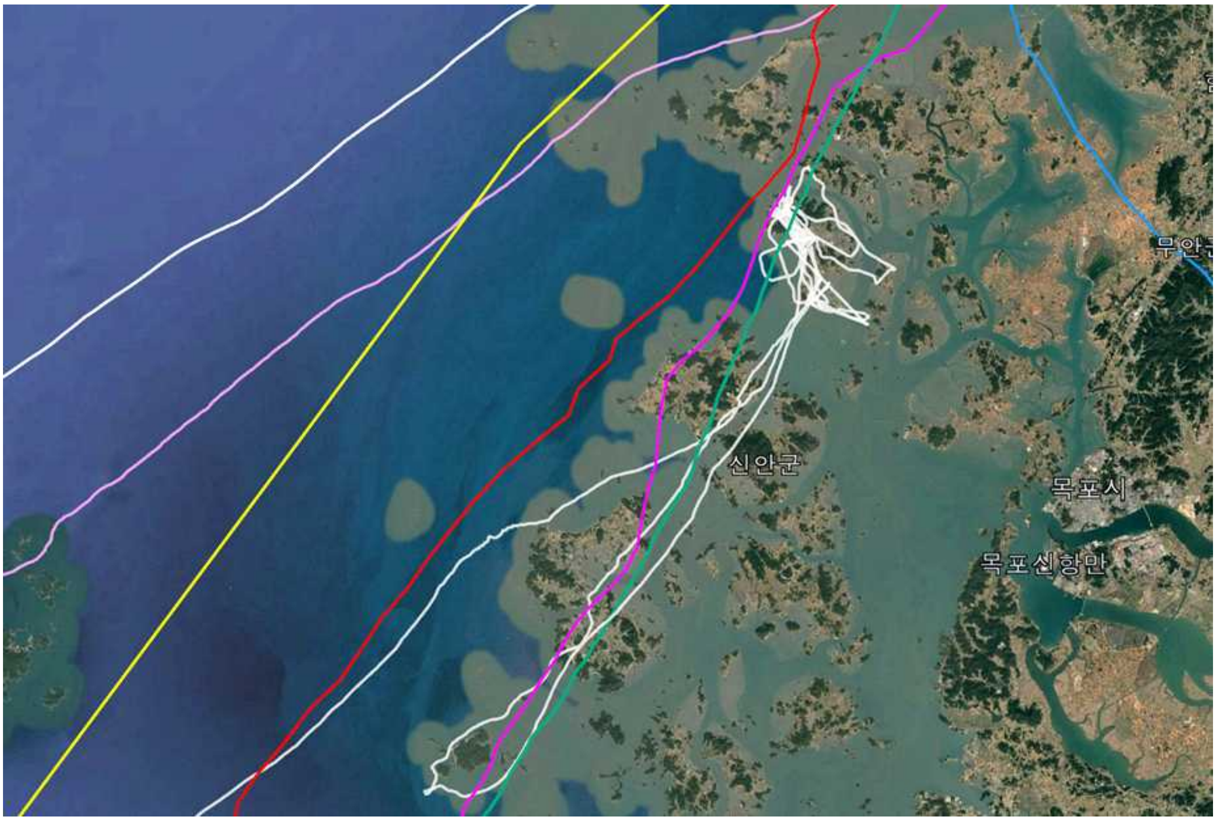


Figure Ⅲ-49. Tracking Data for BFS in Shinan Area (Oct-Nov 2024).

Ⅳ. Discussion

A. Population Status

❙ Post-breeding Population Status of Black-faced Spoonbills in Korea

- According to the results of the synchronized global census conducted in January each year, the number of Black-faced Spoonbills observed was 4,864 individuals in January 2020, 5,222 in 2021, 6,162 in 2022, 6,603 in 2023, and 6,988 in 2024, showing an annual increase of approximately 10% (Figure IV-1).
- The number of breeding pairs in Korea also increased steadily: 1,548 pairs (3,096 individuals) in 2020, 1,845 pairs (3,690 individuals) in 2021, 1,981 pairs (3,962 individuals) in 2022, 2,222 pairs (4,444 individuals) in 2023, and 2,433 pairs (4,866 individuals) in 2024. This represents a 16.1% increase from 2020 to 2021, 6.8% from 2021 to 2022, 10.8% from 2022 to 2023, and 9.5% from 2023 to 2024.
- However, based on the results of the synchronized post-breeding census conducted in September each year in Korea, although the maximum number of individuals increased by 18.1%, 13.3%, and 6.7% annually until 2023, the 2024 census recorded 4,768 individuals—representing a 5.4% decrease compared to 2023.
- This decline is presumed to be due to unfavorable weather conditions such as strong winds during local surveys in September, which may have led to fewer observations compared to August.

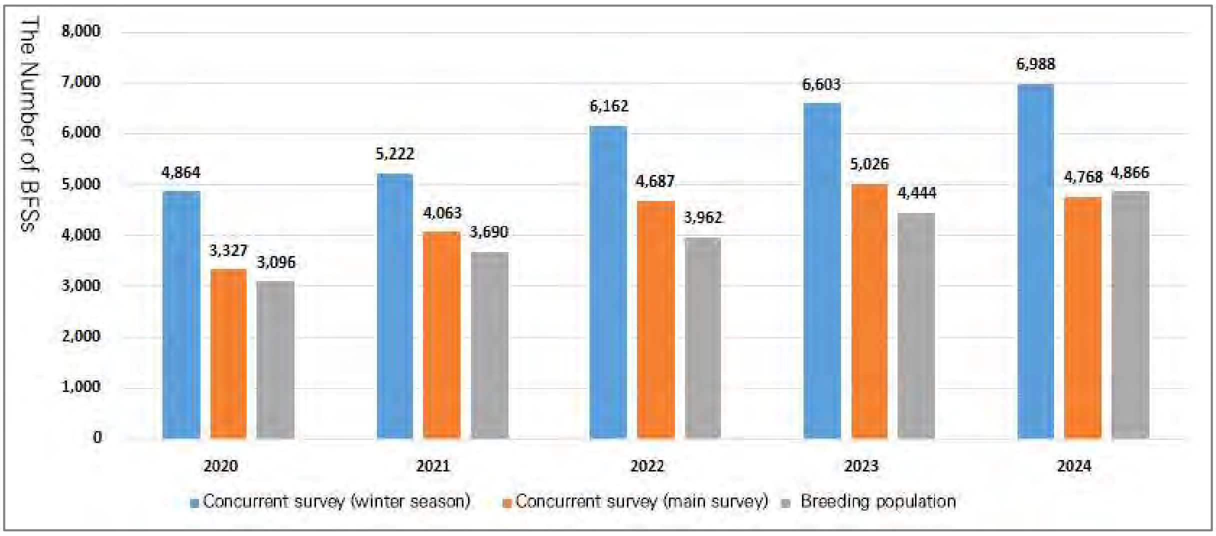


Figure Ⅳ-1. Trends in Global and Domestic BFS Population Sizes Over the Past Five Years.

❙ Regional Population Status of Black-faced Spoonbills

- Based on the survey results from August to November 2024, the distribution of Black-faced Spoonbills did not show significant changes from August (right after fledging) to October (the beginning of migration for wintering). However, after the onset of migration in October, the number of individuals in northern and central regions dropped significantly.
- In contrast, the number of individuals in southern parts of the Korean Peninsula—such as Gomso Bay, Haenam-Jindo, and Jeju Island—showed a slight increase after October. While only a few dozen birds are typically observed in these southern regions, the population appears to be gradually increasing, indicating the need for continued monitoring and observation.
- After fledging, the main habitats for spoonbills were tidal flats and estuaries adjacent to breeding sites, primarily located in Incheon-Gyeonggi Bay, Yeonggwang, and the Seocheon-Gunsan coastal areas.
- The Incheon-Gyeonggi Bay region includes more than 12 breeding sites such as Namdong Reservoir, Maedo, Gaksiam, Sangyeobawi Rock, and Okgwido. Notably, around 800–900 individuals are consistently recorded around Ganghwa Island after the breeding season each year.
- The Seocheon-Gunsan region, which includes recently confirmed breeding sites like Noru Island and Geomeunyeo, has also shown a rising population trend. This area contains expansive tidal flats, and it is presumed that post-breeding birds tend to remain here rather than dispersing widely, staying until they depart for wintering grounds.
- The Yeonggwang tidal flats, adjacent to Chilsan Island —which supports over 300 breeding pairs—regularly host 800–900 individuals each year. In the 2024 survey, more than 1,000 individuals were observed in this area. This high concentration is likely due to the presence of broad tidal flats and wetlands that can be stably utilized without major disturbances.
- In addition to areas near breeding sites, regions like Asan Bay, Hwaseong Lake, Sihwa Lake, and Gomso Bay—despite lacking nearby breeding colonies—still recorded over 300 to 400 individuals, indicating their importance as post-breeding habitats.

B. Habitat Use

❙ Key Habitats and Monthly Changes

- Comparing monthly data from major habitats, most areas showed an increase in the number of observed spoonbills in September compared to August. However, in some areas, the number declined in September, likely due to unfavorable weather conditions during local surveys.

- In the Ganghwa area, the number increased from 656 individuals in August to 991 in September—a 1.5-fold increase. A similar trend was observed in 2023, where the number rose from 363 in August to 877 in September. This suggests that spoonbills breeding outside of Ganghwa likely moved into the tidal flats of Ganghwa after the breeding season.
- In Yeongjong, the count dropped from 471 in August to 399 in September, a decrease of about 18%. This may be due to limited survey coverage of the Second Dredged Spoil Disposal Site, a key area for spoonbills.
- The Ansan (Daebudo, Sihwa) region is likely used by spoonbills that breed in Hwangseodo and Songdo, Incheon. Observations varied significantly—640 individuals in August, 427 in September, and 669 in October—likely due to differences in tidal timing and survey conditions, as bird distribution in this area fluctuates depending on water levels.
- In Saemangeum, the count decreased from 202 in August to 88 in September, then rose to 132 in October. Despite the lack of nearby breeding sites, over 100 individuals have been consistently recorded, likely originating from breeding colonies in Seocheon.
- Gomso Bay saw 188 individuals in August, 131 in September, and 231 in October. Although no breeding colonies are confirmed nearby, the number has been increasing steadily, likely due to post-breeding dispersal from other regions.
- In Yeonggwang, the count rose from 860 in August to 1,085 in September—an increase of about 26%. A similar trend was observed in 2023, and this is believed to reflect intensive use of the area by spoonbills breeding on nearby Chilsan Island rather than new arrivals.
- In Songdo, Incheon around 350 individuals have been observed annually, but numbers tend to drop sharply after August. In 2024, about 200 individuals were recorded consistently from August through October, though some may have already moved to Daebu Island and Sihwa before the simultaneous surveys.
- In Bukdo-myeon, Ongjin County, 155 individuals were observed in August, followed by a decline. This may reflect post-breeding movements toward nearby areas such as Ganghwa.
- In the Yubu Island area of Seocheon, the number rose from 375 in August to 519 in September—an increase of about 38%. As surveys in this area are often conducted by boat, the differences may reflect varying observation conditions.

- In the tidal flats of Muan and Shinan, 63 individuals were observed in August, 97 in September, and 109 in October, a general decline compared to 2023. However, this is likely due to limited manpower and not a real decline in population. Many more spoonbills may have remained undetected in the area. In Shinan County, coastal salt marshes are being replaced by solar power plants, reducing available habitat. In addition, future offshore wind farm development could affect long-distance migration routes across countries.
- In the southern region, Suncheon Bay recorded a maximum of 19 individuals, showing results similar to previous years. In Haenam, up to 92 individuals were observed in September. This area is known for hosting mainly non-breeding individuals from early spring through early winter.

  At the Nakdong River Estuary, a maximum of 14 individuals was observed in October. However, due to ongoing development in the surrounding areas, the preferred habitats for Black-faced Spoonbills have become limited, making stable habitation difficult.
- In the Jeju region, no individuals were observed until September, but the number increased to 1 in October and 30 in November. Jeju has limited mudflat areas, making it difficult for the birds to stay during summer. Nevertheless, it is considered an important site in Korea where a small number of individuals overwinter.

❙ Habitat Threats

- Among the survey sites, ten key areas were identified where more than 200 Black-faced Spoonbills were observed: Ganghwa Island, Yeongjong Island, Songdo, Ansan, Hwaseong Wetland, Asan Bay, Yubu Island in Seocheon, Saemangeum, Gomso Bay, and the Yeonggwang tidal flats. As of September, these top 10 areas accounted for 93.3% (4,449 individuals) of the total observed population. These sites typically feature extensive tidal flats or include reclaimed mudflat areas.
- Of these ten, only six—Ganghwa Island, Songdo, Ansan, Hwaseong Wetland, Yubu Island in Seocheon, and Gomso Bay—have some form of protection. The remaining four areas—Yeongjong Island, Asan Bay, Saemangeum, and the Yeonggwang tidal flats—are unprotected and thus more vulnerable to environmental degradation and development.
- In Asan Bay, a reservoir initially created as part of a logistics support zone for Pyeongtaek Port is under continued development, making future use by spoonbills increasingly unlikely. In Yeongjong Island, land reclamation is ongoing in inland water areas and dredged spoil sites. Zone 1 of the spoil disposal site has already lost its ecological function as bird habitat. With the completion of the Hansaeng Dream Island

development project, increased road traffic and human disturbances are expected to further reduce the area’s suitability as a habitat. The former Hongdae Salt Pond, once a key roosting site, is also under development and is becoming increasingly inhospitable. The Yeonggwang tidal flats face rising threats from expanding offshore wind farms and solar power facilities, which are expected to significantly impact the area's suitability for spoonbills in the future.

- Even among the protected areas, Ganghwa Island and Songdo are facing severe challenges. In Ganghwa, the southern region has not been designated as a protected area, and key high-tide roosts such as Dongju Farm and Yeochari wetlands are under increasing development pressure. In Songdo, reclamation of Zones 10 and 11, along with the construction of the Baegot Bridge and the Second Outer Ring Road, is leading to a noticeable reduction in habitat.
- Hwaseong Wetland is also at risk, with plans for a new airport and the removal of coastal fencing increasing disturbance. The shallow wetland areas in the inland reservoir are also decreasing, further worsening habitat conditions.

C. Conservation and Management

❙ Current Habitat Status and Management for Black-faced Spoonbill

- The majority of Black-faced Spoonbill breeding sites in Korea are concentrated in the Incheon area, with more than 13 breeding islands. Over 80% of the country’s breeding population is located in this region, and the surrounding areas show high post-breeding distribution densities. As such, it is critical to ensure the continued maintenance of these breeding sites and to improve breeding success rates through sustained habitat management. Additionally, effective measures are needed to prevent predators such as Eagle Owls, rats, and raccoons from entering breeding colonies and causing significant damage.
- At Namdong Reservoir, breeding was severely impacted in 2024 when Great Cormorants began nesting on the smaller island, effectively displacing the spoonbills. Given the cormorant’s long breeding season, high reproductive rate, and increasing population, there is a need for a more proactive management strategy. For the small island, it may be necessary to stop supplying nesting materials like tree branches and instead modify the environment to make it suitable exclusively for spoonbills. For the larger island, vegetation should be managed to grow moderately, allowing the birds to breed consistently and stably.

- Beyond tidal flat conservation, greater efforts must be made to secure and stabilize high-tide roosting sites. Many roosting areas remain unstable due to frequent human disturbance, forcing the birds to relocate repeatedly. There have been cases in recent years where previously used roosts disappeared or became unsuitable.
- For example, Geumran Island in Gunsan—an important high-tide roost—has become increasingly difficult for spoonbills to use due to ongoing reclamation. The northern dredged spoil reservoir on Yeongjong Island has been reduced to one-third of its original size due to spoil disposal. Similarly, Dongju Farm in Ganghwa has become unusable after surrounding wetlands were reclaimed. These examples underscore the urgent need for better protection and management of both feeding and roosting sites.

Designation of Protected Areas

- The Black-faced Spoonbill is the most range-restricted and least numerous species among spoonbills, unlike the Eurasian or Royal Spoonbills. Over 90% of its global breeding population is believed to nest on uninhabited islets along the west coast of the Korean Peninsula, particularly in South Korea.
- Recently, the spoonbill breeding range has expanded from the Incheon–Gyeonggi Bay area to Seocheon (Yubu Island area) and Yeonggwang, making it increasingly important to protect tidal flats and wetlands throughout the entire West Sea coast.
- Currently, the tidal flats of Ganghwado in Incheon are designated as a Natural Monument area for the Black-faced Spoonbill, while the Songdo tidal flats are designated as a Wetland Protected Area and a Ramsar Site. Additionally, areas such as Yubu Island in Seocheon, the Gochang tidal flats, and the Shinan tidal flats are designated as part of the UNESCO World Natural Heritage site "Getbol, Korean Tidal Flats."

  However, the southern tidal flats of Ganghwado, which are important for the Black-faced Spoonbill, are currently excluded from protected area designation.

  Despite the high density of Black-faced Spoonbills on Yeongjongdo, the surrounding tidal flats and reservoirs near Incheon International Airport remain unprotected.

  If the tidal flats of Ganghwa and Yeongjong are added to the World Natural Heritage "Getbol, Korean Tidal Flats" in the future, it is expected that they will play an important role in the conservation of the Black-faced Spoonbill.
- Additional protected area designations are also needed in the Gyeonggi Bay region. While Daebu Island in Ansan has been designated a Wetland Protection Area, adjacent Sihwa Lake, which supports a large number of spoonbills, remains outside that

boundary. Although Hwaseong Wetland has some protection, its limited scope is insufficient. Despite heavy damage from Pyeongtaek Port development, Asan Bay still functions as a key habitat. Protecting even the remaining mudflats and reservoirs in this area would be meaningful.

- Saemangeum, though largely reclaimed, still contains patches that remain critical for spoonbills. Recognizing the value of these wetlands and designating at least core areas as protected could aid conservation.
- Yeonggwang Tidal Flats are among the most critical habitats for Black-faced Spoonbills. Yet, the core roosting areas are being reclaimed or replaced with solar energy facilities, and offshore wind farms pose additional threats. Despite this, there is an urgent need to recognize the conservation value of Yeonggwang's tidal flats and designate key sites as protected areas.
- Other important coastal wetland habitats also require protection. In counties such as Muan, Shinan, and Haenam, previously favored coastal wetlands are now being converted into solar power complexes, disrupting suitable habitat. It is crucial to conduct prior ecological assessments and take conservation action before these areas are developed.

Ⅴ. References

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Ⅵ. Appendices

A. Monthly Detailed Results of Nationwide Monitoring of Black-faced Spoonbills

Appendix 1. Results of the 1st Simultaneous National Monitoring (August 2024)

No.	Site	Number of Individuals	Date	Observers	BFS Monitoring
1	Baengnyeongdo	–	Aug 23	Park Jeong-woon	
2	Yeonpyeongdo	–	Not surveyed	–	
3	Gyodong-do, Northern Gangwha	117	Aug 23	Kwon In-Ki, Yoo Seong-yeon	
4	Seodo-myeon (Boleum, Jumun-do)	209	Aug 31	Kim Soon-rae, Jeong Ui-soon	
5	Seokmo-do area	86	Aug 24	Jeong Ui-soon, Yoon Jae-ok	
6	Southwest Gangwha (Dongmakri-Hupo)	106	Aug 25	Kim Soon-rae	
7	Southern Gangwha (Bunoh-Seonduri)	80	Aug 25	Park Young-ran, Jeong Ui-soon, Kim Soon-rae	
8	Eastern Gangwha (Donggeom-Chozi-Yeonmizeong)	58	Aug 25	Park Young-ran, Jeong Ui-soon	
9	Incheon Seo-gu, Anamho, Maedo	17	Aug 24	Park Young-ran	57E
10	Han River Estuary (Gimpo-Songdongri)	17	Aug 25	Cho Kyung-oh	
11	Yeongjong, Yongyu-do	471	Aug 23- 25	Ham Hyeong-bok, Kim Kyung-sook, Lee Yeon-kyung, Kang In-sook, Kwon Kyung-hwan, Jung Sung-hye	K34, H66, H70, H90, K79, 40E, 56E, R29
12	Bukdo-myeon, Ongjin (Jangbong, Sindo, Sido)	155	Aug 25	Tak Jun-sik, Kim Woo-chul	
13	Aam-do, Yonghyeon tidal flats	91	Aug 24	Bin Nam-ok, Oh Ji-yoon, Oh Heung-beom, Kim Bok-soon, Lee Mi-nam, Hwang Young-ja	84E, M61, R21
14	Namdong Reservoir, Distric 11	29	Aug 24	Kim Mi-eun, Kim Eun-hee, Ryu Ki-chan, Lee Ui-soon, Lee Hyuk-jae, Kim Kyung-sook, Cho Soo-young	

15	Gojan tidal flats, District 10	16	Aug 24	Shin Ae-sung, Oh Heung-beom, Oh Ji-yoon	
16	Sorae Wetland Park, Siheung	24	Aug 24	Noh Eun-sook, Jang Hee-sook, Jo Hyun-ja, Kim Jung-hee, Song Eun-hee, Shin Hyun-ho	
17	Hwangsaebawi, Sorae tidal flats	62	Aug 24	Kim Jung-hee, Song Eun-hee, Shin Hyun-ho	
18	Sihwa Lake (Daesong Wetland)	497	Aug 24	Lee Ki-seop, Kim Jin-geum, Lee Gye-sook, Ryu Soon-seop	77E, 82E, V52, A42, K94, R19, K20
19	Daebu-do, Yeonheung-do	143	Aug 24	Park Jong-hyun	
20	Hwaseong Wetland (Namyang, Seosin)	309	Aug 24	Im Bang-yeon, Kwon In-Ki	
21	Asan Bay (Incl. Sapgyo Lake)	598	Aug 24-25	Kim Sang-seop, Kim Young-chul, Lee Ki-seop	V22, T90, V95, 68E, 70E
22	Cheonsu Bayd-Taean	22	Aug 23, 26	Kim Shin-hwan, Ji In-sook	
23	Seocheon area (incl. Yubu Island)	355	Aug 23, 25	Lee Ye-soon, Jeong Hong-tae, Oh Dong-pil, Oh Seung-joon	R07, N44, R13
24	Saemangeum	202	Aug 24	Oh Dong-pil, Oh Seung-joon	
25	Gomso Bay	188	Aug 25	Joo Yong-ki, Jang Taek-soo	
26	Yeonggwang tidal flats	860	Aug 24-25	Hong Chul-hee, Myung Ho, Kim Jin-geun	90K, E42, N08, N99, R10, S13, S18, T53, T85, Y88, SX1, V13, 91K
27	Shinan, Muan	63	Aug 24-25	Kim Seok-yi, Myung Ho, Hong Chul-hee	
28	Haenam region	34	Aug 24	Park Jin-seon	K30
29	Suncheon Bay	2	Aug 24	Kim In-cheol	
30	Gwangyang Bay, Gangjin Bay	-	Not surveyed	-	
31	Nakdong Estuary	0	Aug 24	Kim Si-hwan	
32	Jeju Island	0	Aug 24	Ji Nam-jun	
33	Others (e.g., Boryeong)	-	-	-	
Total		4,811			

Appendix 2. Results of the 2nd Simultaneous National Monitoring (September 2024)

No.	Region	Number of Individuals	Date	Observers	BFS Monitoring
1	Baengnyeongdo	-	Sep 22	Park Jeong-woon	
2	Yeonpyeongdo	-	Not surveyed	-	
3	Gyodong-do, Northern Gangwha	83	Sep 22, 23	Kim Soon-rae, Yeo Sang-gyeong, Choi Soon-rae	
4	Seodo-myeon (Boleum, Jumun-do)	310	Sep 20	Kwon In-Ki	
5	Western Ganghwa (Seokmo-do)	145	Sep 20, 22	Kwon In-Ki, Kim Soon-rae	V73
6	Southwest Ganghwa (Dongmak, etc.)	403	Sep 21	Seol Taek-hyun, Kim Soon-rae	
7	Southern Ganghwa (Seondu, Bunoh, Gaksiam)	37	Sep 21	Park Young-ran	
8	Eastern Gangwha (Donggeom, Chozi, Yeonmijeong)	13	Sep 21	Choi Soon-rae	H88
9	Seo-gu, Anamho, etc.	18	Sep 22	Park Young-ran, Kim Hwa-jung	M08(추정)
10	Han River Estuary	13	Sep 22	Cho Kyung-oh	
11	Yeongjong-do	399	Sep 22	Ham Hyeong-bok, Jung Sung-hye, Park Min-ja	S39, E94, R29
12	Ongjin-gun Bukdo-myeon	61	Sep 22	Ryu Ki-chan, Tak Jun-sik	S06
13	Aam-do, Yonghyeon tidal flats	81	Sep 22	Bin Nam-ok, Kim Kyung-sook, Hwang Young-ja	
14	Namdong Reservoir, District 11	22	Sep 22	Kwon In-Ki, Kim Mi-eun, Shin Hyun-ho, Yang Min-seung, Kang Young-sook, Kim Hyung-tae, Cho Yoon-hee	T87
15	Gojan tidal flats, District 10	69	Sep 22	Oh Heung-beom, Park Ga-hyun, Shin Ae-seong, Shim Jae-won, Lee Da-won	H54, Y63, N89, E92, H01
16	Sorae Wetland Park, Siheung	11	Sep 22	Jo Hyun-ja, Noh Eun-seok, Jang Hee-sook	
17	Hwangsaebawi, etc,	6	Sep 22	Park Eun-ha, Kim Jung-hee, Oh Hwan-bong	
18	Siwha Lake	327	Sep 22	Lee Ki-seop, Lee Gye-sook	64K, V47, 06K, 10E, E37, Y67, M05, X97
19	Daebu-do	100	Sep 21	Park Jong-hyun	
20	Hwaseong Wetland	419	Sep 21	Im Bang-yeon,	97E, S88

				Jeong Gi-seok	
21	Asan Bay	201	Sep 21, 23	Kim Young-chul, Kim Sang-seop	S90
22	Cheonsu Bay–Taean	3	Sep 22, 23	Ji In-sook, Kim Shin-hwan	·
23	Seocheon area (Yubu Island incl.)	519	Sep 19, 21	Lee Ye-soon, Jeon Hong-tae, Joo Yong-ki	E61
24	Saemangeum	88	Sep 21	Oh Dong-pil	·
25	Gomso Bay	131	Sep 21	Jang Taek-soo, Joo Yong-ki	88K, T99, S00
26	Yeonggwang tidal flats	1085	Sep 22	Hong Cheol-hee, Myung Ho, Kim Jin-geun, Jeong Ha-jin	95K, 2019_K31, 2019_K32, M56, S18, V15, V17, E42, E76, N53, V98, 89E, 96E, N08, T90, S13, 98K
27	Shinan, Muan	97	Sep 21, 22	Kim Seok-yi, Myung Ho	·
28	Haenam Jindo	92	Sep 21	Park Jin-seon	2019_K30
29	Suncheon Bay	11	Sep 21	Kim In-cheol	·
30	Gwangyang, Gangjin Bay, etc.	0	Sep 21	Han Hae-kwang	·
31	Jeju Island	3	Sep 24	Kim Si-hwan	·
32	Jeju Island	0	Sep 22	Ji Nam-jun	
33	Others (e.g., Boryeong)	21	Sep 21, 22	Lee Jong-ryul, Kwon In-Ki	R11
Total		4,768			45

Appendix 3. Results of the 3rd Simultaneous National Monitoring (October 2024)

No.	Region	Number of Individuals	Date	Observers	BFS Monitoring
1	Baengnyeongdo	0	Oct 5	Park Jeong-woon	
2	Yeonpyeongdo	0	Not surveyed	-	
3	Gyodong-do, Northern Ganghwa	105	Oct 5-6	Kim Soon-rae, Jeong Ui-soon, Kwon In-Ki	
4	Seodo-myeon (Boleum, Jumun-do)	272	Oct 6	Kwon In-Ki, Jeong Ui-soon, Kim Soon-rae, Jeon Ji-ye	73E
5	Western Ganghwa (Seokmo-do)	115	Oct 5	Kim Soon-rae, Jeong Ui-soon	
6	Southwest Ganghwa	340	Oct 6	Seol Taek-hyun, Kim Soon-rae, Jeong Ui-soon	
7	Southern Ganghwa	69	Oct 6	Park Young-ran, Kim Soon-rae, Jeong Ui-soon	H53, Y29, 47K, E26, 62E
8	Eastern Ganghwa	54	Oct 6	Kwon In-Ki	67E
9	Seo-gu, Anamho, Maedo, etc.	0	Oct 6	Park Young-ran	
10	Han River Estuary	28	Oct 5	Cho Kyung-oh	
11	Yeongjongdo	372	Oct 6	Kwon Kyung-hwan, Ham Hyung-bok, Choi Ji-hyun, Park Min-ja, Jeong Sung-hye	2019_K34, 56E, S58
12	Ongjin-gun Bukdo-myeon	78	Oct 7	Kim Woo-chul	
13	Aam-do, Yonghyeon, District 11N	20	Oct 6	Bin Nam-ok, Kim Mi-eun, Park Yu-gil	M61
14	Namdong Reservoir	53	Oct 6	Choi Jeong-hee, Son Ji-hye, Lee Hyuk-jae, Jeon Soo-min, Hwang Soo-kyung, Kang Young-sook, Jeong Eun-ah, Cho Yoon-hee	y63, Y70, M67
15	Gojan Tidal Flat	31	Oct 6	Oh Heung-beom, Shin Ae-seong, Kim Mi-jeong	Y70
16	Sorae Wetland, Siheung	24	Oct 6	Jo Hyun-ja, Jang Hee-sook, Kim Eun-hee, Kim Jeong-hee, Song Eun-hee, Shin Hyun-ho	
17	District 10,	70	Oct 5	Park Eun-ha,	H01

	Hwangsaebawi			Oh Hwan-bong	
18	Sihwa Lake	426	Oct 5	Lee Gye-sook, Kim Jin-geum, Lee Ki-seop, Ryu Soon-seop	06K, X97, Y48, R11, R21, 21K, 22E, R20, 28E, A42, 77E, 19K
19	Daebu-do	243	Oct 6-7	Park Jong-hyun, Lee Ki-seop	M06
20	Hwaseong Wetland	381	Oct 3-4	Jeong Gi-seok, Im Bang-yeon	77E, 83E, R06, V23, V27
21	Asan Bay	280	Oct 6	Kim Young-chul, Yoon Hee, Kim Sang-seop	63E(83E), R05, E66, 68E
22	Cheonsu Bay–Taean	50	Oct 6-7	Kim Shin-hwan, Ji In-sook	
23	Seocheon (incl. Yubu Island)	510	Oct 6	Lee Ye-soon, Ryu Ki-chan, Joo Yong-ki, Jeon Hong-tae	R07, R61, E02, E92
24	Saemangeum	132	Oct 6	Oh Dong-pil, Kim Yoon-jeon, Oh Seung-joon	
25	Gomso Bay	231	Oct 6	Jang Taek-soo	
26	Yeonggwang tidal flats	588	Oct 5	Kwon In-Ki, Joo Yong-ki	V31, S18
27	Shinan, Muan	109	Oct 4-5	Kim Seok-yi, Joo Yong-ki, Park Jin-seon, Cho Ki-seok, Choi Myung-sook	32K
28	Haenam, Wando, Jindo	81	Oct 6	Kim In-cheol	06E
29	Suncheon Bay	17	Oct 5-6	Lee Myeong-jeong, Park Moon-sik, Han Hae-kwang	
30	Gwangyang Bay	1	Oct 5	Kim Si-hwan	
31	Nakdong Estuary	14	Oct 5-6	Ji Nam-jun, Kang Chang-wan	
32	Jeju Island	1	Oct 5	Park Jin-seon	
33	Others (Boryeong)	34	Oct 3	Kwon In-Ki	N85
Total		4,729			

Appendix 4. Results of the 4th Simultaneous National Monitoring (November 2024)

No.	Region	Number of Individuals	Date	Observers	BFS Monitoring
1	Baengnyeongdo	0	Not surveyed	–	
2	Yeonpyeongdo	0	Not surveyed	–	
3	Gyodong-do, Northern Ganghwa	11	Nov 17	Park Geon-seok, Yeo Sang-gyeong	
4	Seodo-myeon	14	Nov 13	Kwon In-Ki	
5	Seokmo-do area	0	Nov 15	Kim Soon-rae, Jeong Ui-soon	
6	Southwest Gangwha	0	Nov 17	Kim Soon-rae, Jeong Ui-soon	
7	Southern Gangwha	40	Nov 17	Kim Soon-rae, Jeong Ui-soon, Park Geon-seok	
8	Eastern Gangwha	2	Nov 17	Yeo Sang-gyeong	
9	Incheon Seo-gu	0	Nov 17	Park Young-ran	
10	Han River Estuary	12	Nov 18	Cho Kyung-oh	
11	Yeongjongdo, Yongyu-do	26	Nov 17	Ham Hyung-bok, Kwon In-Ki	Y01, 50K, Y03
12	Ongjin-gun Bukdo-myeon	0	Nov 15, 17	Ham Hyung-bok, Kim Woo-cheol	
13	Aamdo, Yonghyeon-gaetgol	0	Nov 17	Kim Kyung-sook, Lee Gwang-bok, Lee Mi-nam, Lee Mi-hwa	
14	Namdong Reservoir Area	12	Nov 17	Ryu Ki-chan, Son Ji-hye, Kim Do-yeon, Oh Seung-joo, Woo Hyuk-jin, Yoon Ryeo-eun, Lee Da-won, Shim Jae-won, Kim Hyeong-tae	
15	Gojan Tidal Flat Area	0	Nov 17	Oh Heung-beom, Lee Gwang-bok	
16	Sorae Wetland, Siheung	0	Nov 17	Oh Heung-beom, Jang Hee-sook, Kim Jeong-hee, Shin Hyun-ho	
17	Hwangsaebawi	2	Nov 17	Park Eun-ha, Oh Hwan-bong, Kim Jeong-hee, Shin Hyun-ho	
18	Sihwa Lake	7	Nov 15	Lee Gye-sook, Kim Jin-geum	
19	Daebu-do, Yeongheung-do	16	Nov 15	Park Jong-hyeon	
20	Hwaseong Wetland	32	Nov 16, 17	Jeong Gi-seok, Im Bang-yeon	
21	Asan Bay	17	Nov 15, 17	Kim Sang-seop, Kim Young-cheol,	68E

				Yoon Hee	
22	Cheonsu Bay–Taean	3	Nov 18	Ji In-sook, Kim Shin-hwan	
23	Seocheon (incl. Yubu Island)	63	Nov 17	Jeon Hong-tae, Lee Ye-soon, Joo Yong-ki	
24	Saemangeum	9	Nov 15, 17, 18	Oh Dong-pil, Oh Seung-jun, Park Hyung-geun	
25	Gomso Bay	6	Nov 17	Jang Taek-soo	
26	Yeonggwang tidal flats	86	Nov 16–17	Hong Cheol-hee, Jeong Ha-jin	
27	Shinan, Muan	10	Nov 15–16	Kim Seok-yi, Joo Yong-ki	
28	Haenam Area	5	Nov 16	Park Jin-seon, Han Hae-gwang	
29	Suncheon Bay	14	Nov 15, 17, 20	Kim In-cheol	
30	Gwangyang Bay, Gangjin Bay	5	Nov 17	Han Hae-gwang, Lee Myeong-jeong, Park Moon-sik	
31	Nakdong Estuary	11	Nov 16–17	Kim Si-hwan	
32	Jeju Island	30	Nov 16	Ji Nam-jun	H54, S06
33	Others	0	Nov 17	Park Jong-hyeon	
Total		433			

B. Photographs from the Nationwide Monitoring of Black-faced Spoonbills


BFS breeding site at Gaksiam, Ganghwa Island (A51)

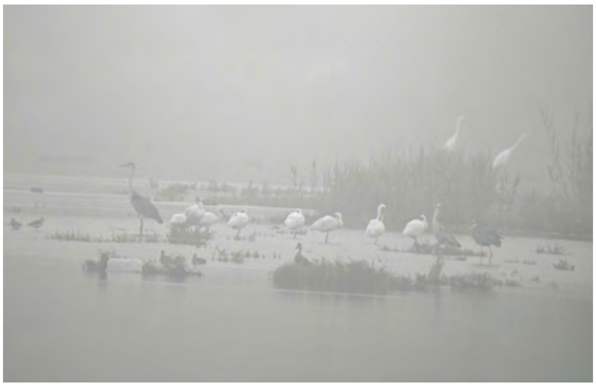

BFS along the coast of Chojin, Ganghwa


BFS resting at Okguido, Siheung


BFS juvenile in the Hojobeol area, Siheung


BFS at the Hongdae Salt Pan, Yeongjongdo, Incheon


BFS resting in Songsan Retention Pond, Incheon

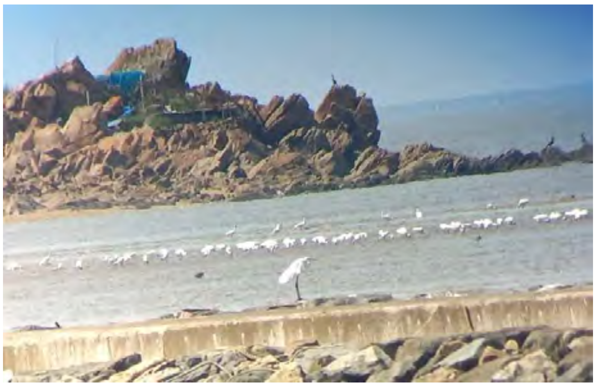

BFS in the Jangwoe Wetland, Seosin-myeon, Hwaseong


BFS resting inside Hwaseong Lake


BFS at Geolmaeri Mudflat, Asan


BFS parent and chick along the Dasari Coast, Seocheon


BFS (E61) in the tidal flats of Seocheon


BFS foraging along the coast of Yubu Island


BFS at Daecheoncheon, Boryeong


BFS in the Suncheon Bay area


BFS foraging at Myeonggeummeori, Nakdong Estuary


BFS resting along the coast of Aphaedo, Sinan

BFS in the Miruji tidal flats, Ganghwa

BFS resting at Yeochari Mulggwang, Ganghwa

BFS in the Suyang-ri tidal flats, Gochang

BFS in the Namdong Retention Pond

BFS foraging in the Daesong Wetland, Siheung

BFS foraging in the Han River Estuary

BFS resting on the Duuri Coast, Yeonggwang

BFS resting in the southern tidal flats of Daebudo, Ansan

C. 2024 National Black-faced Spoonbill Monitoring

2024 National Workshop on Black-faced Spoonbill Monitroting and inter-habitat Collaboration	
Date	2025. 1. 7. 14:00~17:00
Venue	Black-faced Spoonbill Ecological Learning Center, Incheon (Hybrid with online participation)
Organizers	Black-faced Spoonbill and Friends, Waterbird Network Korea
Support	East Asian-Australasian Flyway Partnership (EAAFP) Secretariat
Program	▷ *2024 Black-faced Spoonbill Breeding Status in Korea* - Dr. Yang Min-Seung, National Institute of Ecology ▷ *2024 National Monitoring Results during Autumn Migration* - Kwon In-Ki, Director, Black-faced Spoonbill and Friends ▷ *Discussion on Collaboration for Habitat Protection* - Yoon Jongmin (Bird Team Leader, National Institute of Ecology) - Ahn Yeounhee (Director, EAAFP Secretariat) - Jeon Hongtae (Seocheon County Migratory Bird Eco-Center) - Jung Youngjin (Director, Gochang Ramsar Wetland Center) - Park Changwook (Shinan County World Heritage Division)
Participants	34
Outcomes	1. 2024 Breeding Update on Black-faced Spoonbills in Korea - *(Spoonbill Restoration)*: Five eggs at risk of submersion on Gaksiam Island, Ganghwa County were rescued and sent to Seoul Zoo; one chick successfully hatched through artificial incubation. - *(Reintroduction)*: Two individuals released into Ganghwa Tidal Flats after flight and hunting adaptation training. - *(Population Dynamics)*: 2,433 pairs confirmed breeding on 27 islands in 2024, including a newly discovered site on Janggodo (39 pairs). - Of 84 juveniles banded, 40 (41.9%) were re-sighted. - Nesting environments improved on six islands including Namdong Reservoir (471 nesting platforms installed, nest materials provided 9 times). - Remote sensor cameras used to monitor breeding threats - Invasive species identified include Eurasian Eagle Owl, raccoons, and Great Cormorants. - *(ESG Project)*: Korean Gas Corporation-NIE ESG initiative expanded nesting space by installing artificial rock structures on Gaksiam Island.
	2. 2024 National Spoonbill Monitoring - *(Monitoring)*: Conducted four times from August to November; maximum of 5,918 individuals recorded. o August: 4,811 individuals (17 regions)

    - September: 4,768 individuals (18 regions)
    - October: 4,729 individuals (18 regions)
    - November: 433 individuals (17 regions)
- By region:
    - Northwest region: Max 3,085 individuals (Aug)
    - Mid-west region: Max 1,847 individuals (Sept)
    - Southern region: Max 223 individuals (Oct)
- Key high-density areas: Yeonggwang Tidal Flat, Ganghwa County, Incheon Jung-gu, Seocheon Yubu Island, Ansan (Daebudo and Sihwa), and Songdo.

- *(Recommendations)*
    - Continuous protection of major spoonbill habitats is essential.
    - Consider designating protection zones for tidal flats, coastal reservoirs, and abandoned salt pans used by the species.
    - Expand designation of Wetland Protected Areas, World Heritage Sites (*Getbol, Korean Tidal Flats*), and Flyway Network Sites, especially in Yeonggwang, Ganghwa, and Jung-gu (Incheon).
    - Restrict fishing and access in major roosting areas; raise public awareness and promote conservation.

3. Collaborative Approaches for Habitat Protection

- *(Building Local Government Collaboration)*
    - Over half of Korea's spoonbill population breeds in Incheon, making the region central to past conservation efforts. But as the distribution expands to the central and southern west coast (e.g., Hwaseong, Seocheon, Gochang, Yeonggwang, Shinan, Suncheon), collaboration with respective local governments is crucial.
    - Some counties (e.g., Seocheon, Gochang, Shinan) already conduct integrated migratory waterbird monitoring under their World Heritage designations. Though separate spoonbill projects are difficult to fund, they fall within this broader scope.
    - A network among local officials in major habitats could enhance communication and response. Expanding the existing "Coexistence Council for Spoonbills" led by NIE could support this.
    - Regular gatherings for monitoring participants nationwide are needed to share experience and knowledge.
- *(Promoting Citizen Monitoring)*
    - Protecting bird habitats, especially tidal flats, requires strong local engagement and citizen science.
    - In Incheon, the Black-faced Spoonbill NGO Network is active; in other regions, citizen participation is growing through World Heritage monitoring programs.
    - To engage broader age groups, social media campaigns and events are recommended. With growing interest in birdwatching as a hobby, there's significant potential to expand volunteer monitoring.

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- *(Utilizing Monitoring Data)*
    - Annual reports should be distributed both online and offline to ensure accessibility for local governments, institutions, NGOs, and citizens.
    - The findings can guide change detection in major habitats and help identify new potential sites.
    - It can also help prioritize regions for further monitoring (e.g., Shinan) and support decisions on where habitat management is most needed.
    - These results offer a valuable basis for securing long-term funding from local governments and corporations, especially when aligned with ESG initiatives.

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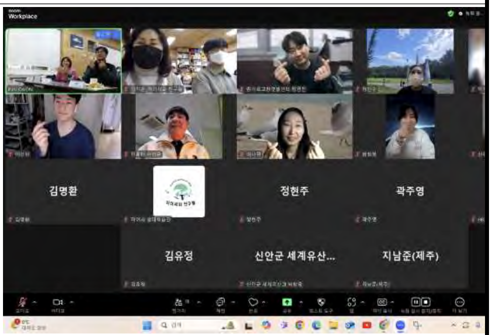

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Report 2024

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