Surveillance system of highly pathogenic avian influenza (HPAI) in wild birds in Japan

Ministry of the Environment (MOE), Government of Japan

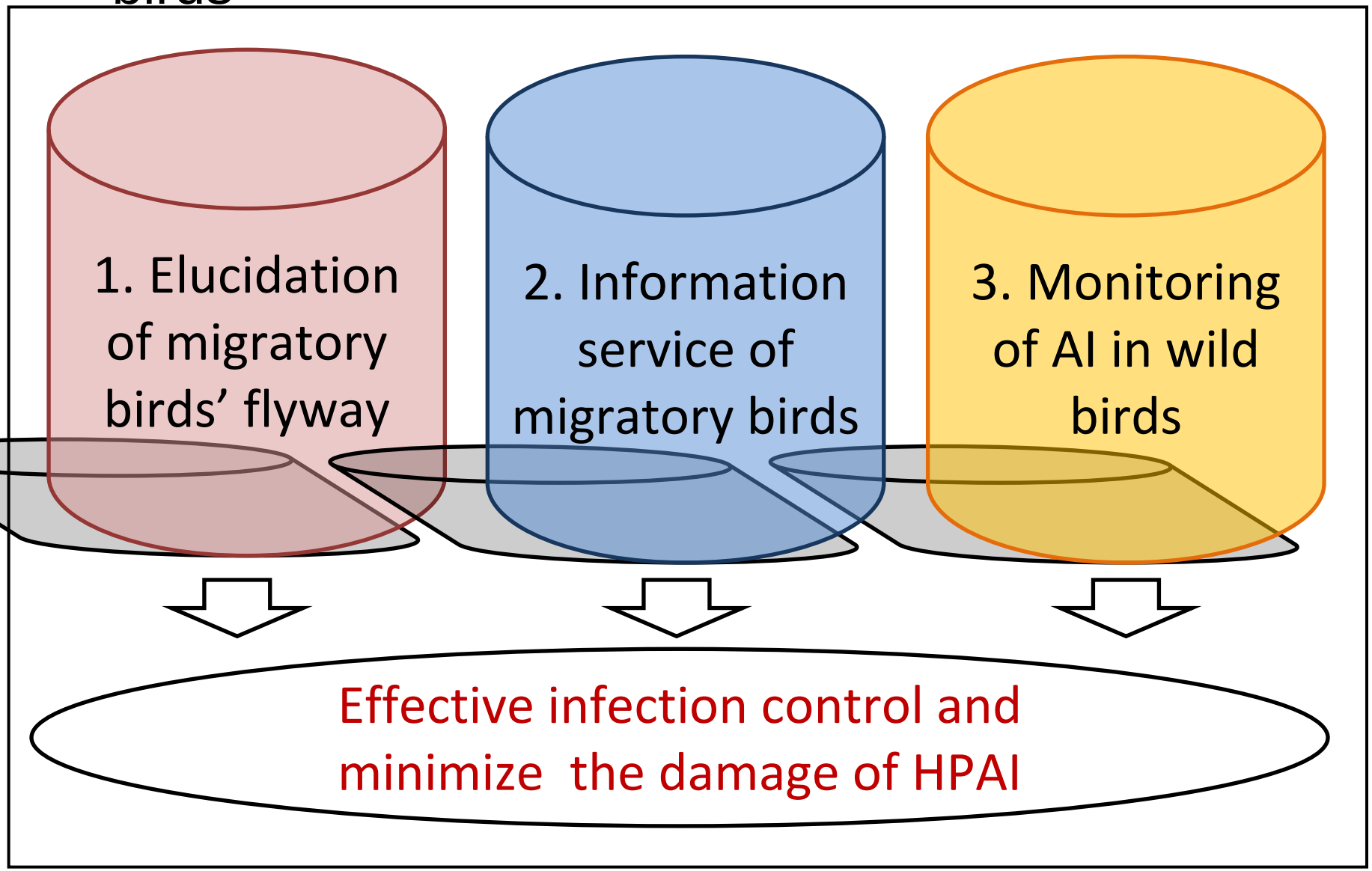
Background of coping with HPAI in wild birds in Japan

- 2004 infected crows were confirmed around the chicken farms which had HPAI outbreaks (secondary infection)
- 2007 a Mountain hark-eagle
- 2008 Whooper swans
- 2008 Manual of technique and coping with HPAI in wild birds for local governmental agencies

  → start nation-wide surveillance

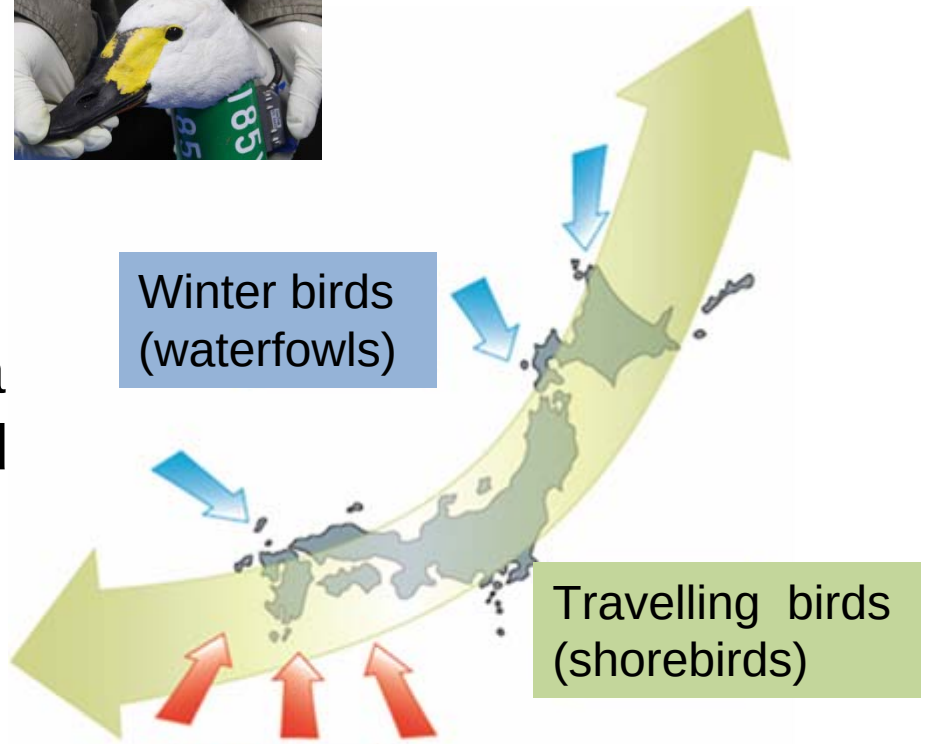
- 2010-2011 outbreaks in wild birds (15 species, 60 birds), domestic birds→revise the manual

Surveillance framework for Avian Influenza in wild birds



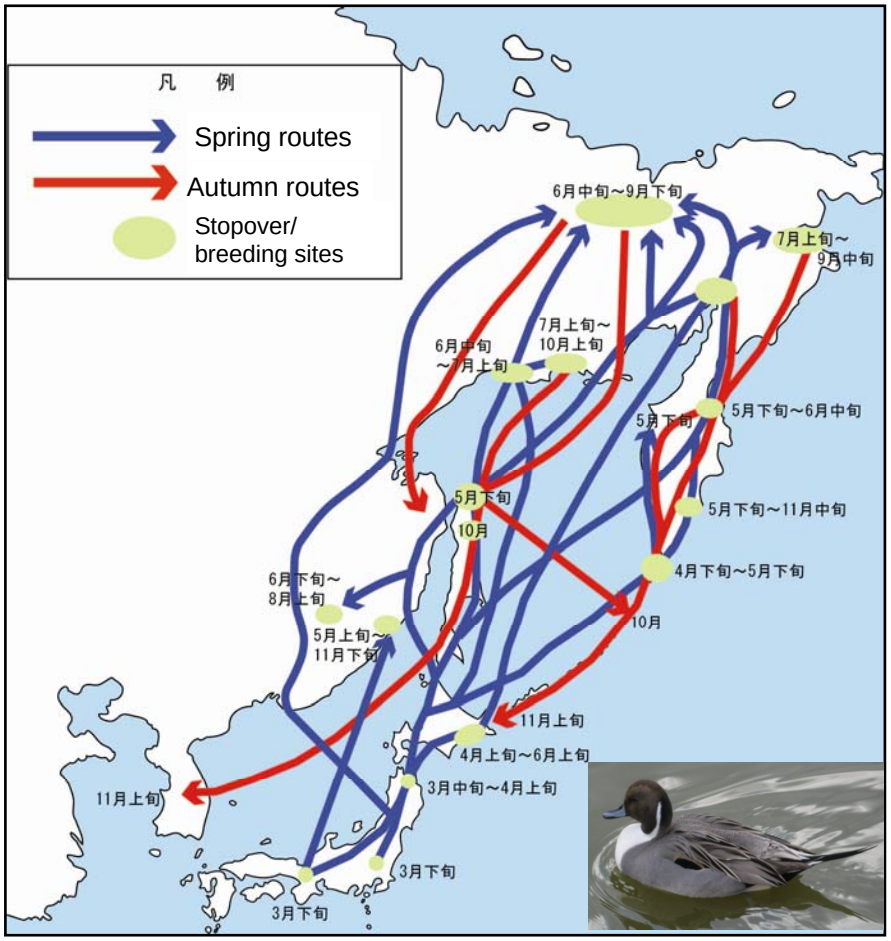
1. Elucidation of migratory birds' flyway

- Satellite tracking the migration of waterfowl (ducks and swans) by Prof. Higuchi and MOE
- Bird banding by Yamashina Institute for Ornithology and MOE



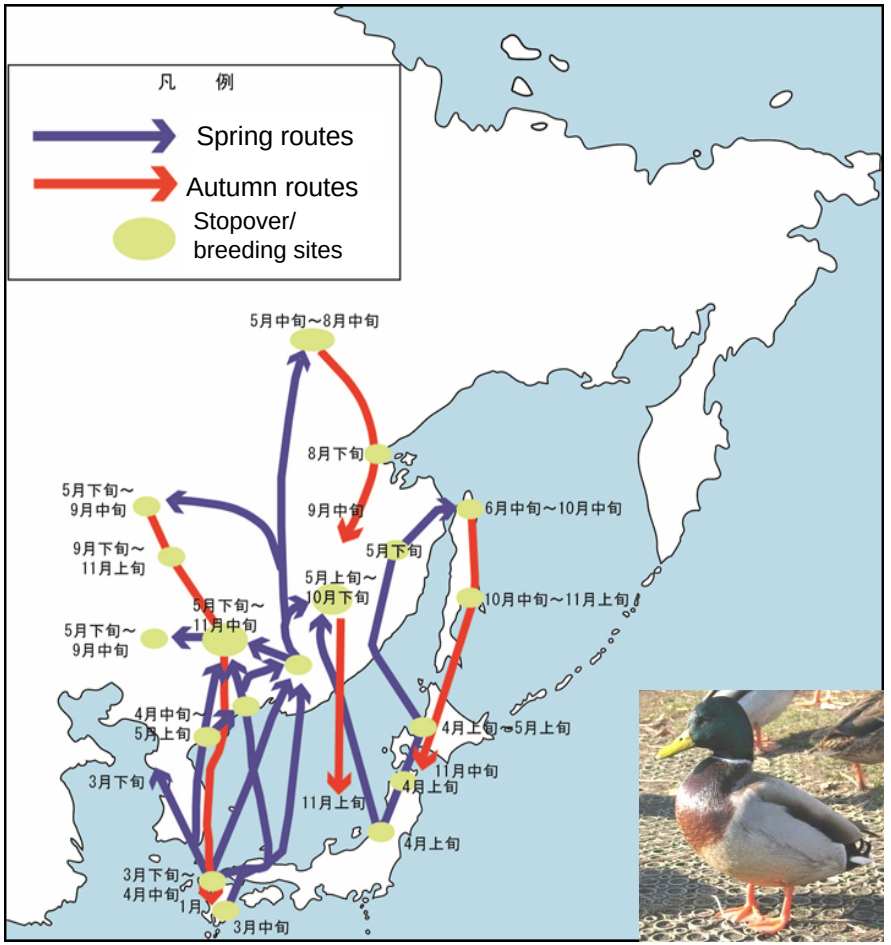
The data of migration route between breeding grounds, stop-over points and wintering grounds

1. Elucidation of migratory birds' flyway



Northern pintails

Prof. Higuchi, the University of Tokyo



Mallards

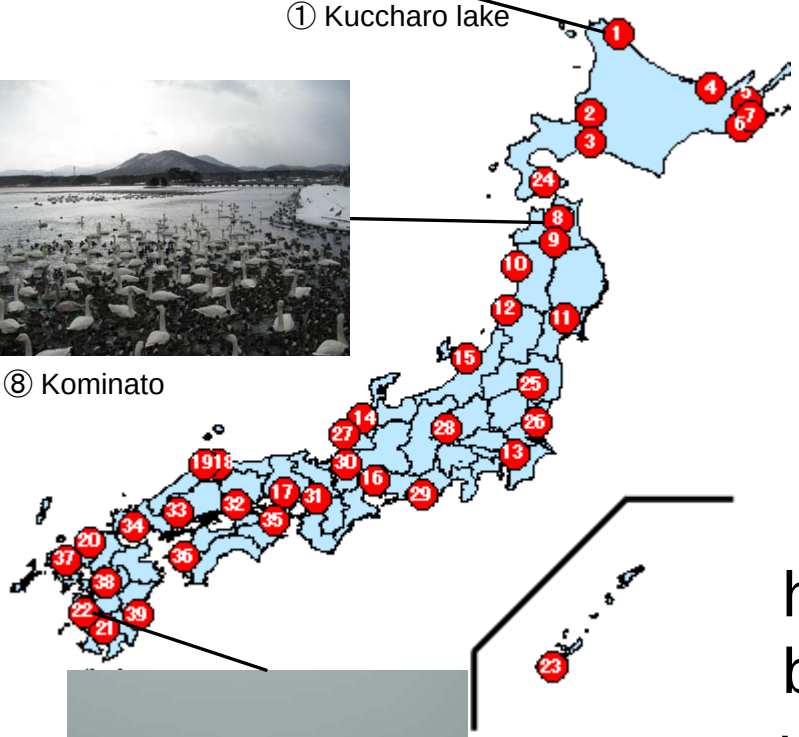
Prof. Higuchi, the University of Tokyo

Information sharing with neighboring countries is important

2. Information service of migratory birds

① Kuccharo lake

⑧ Kominato



・Izumi

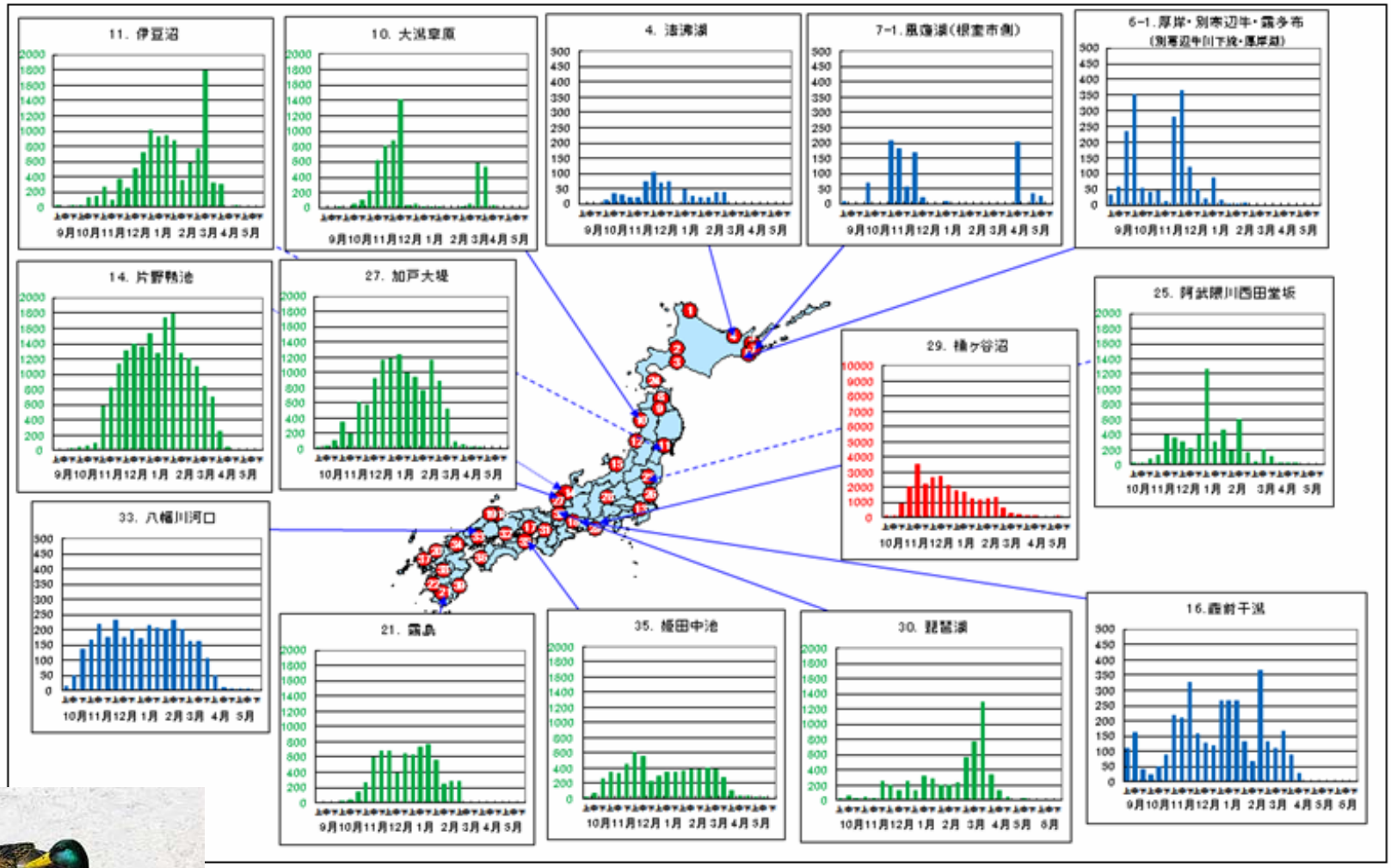
- During the migration season (October and May)
- Regular observation of migratory birds
- 39 locations in National Wildlife Protection Areas and several other locations since 2007

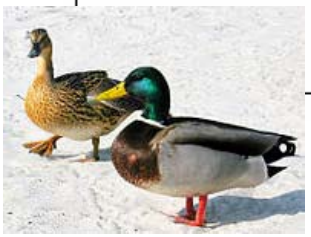
how many birds, what kinds of birds, when they come and go, where they congregate in Japan

http://www.env.go.jp/nature/dobutsu/bird_flu/migratory/ap_wr_transit/index.html

2. Information service of migratory birds

Number of Mallards during fall 2011 and spring 2012

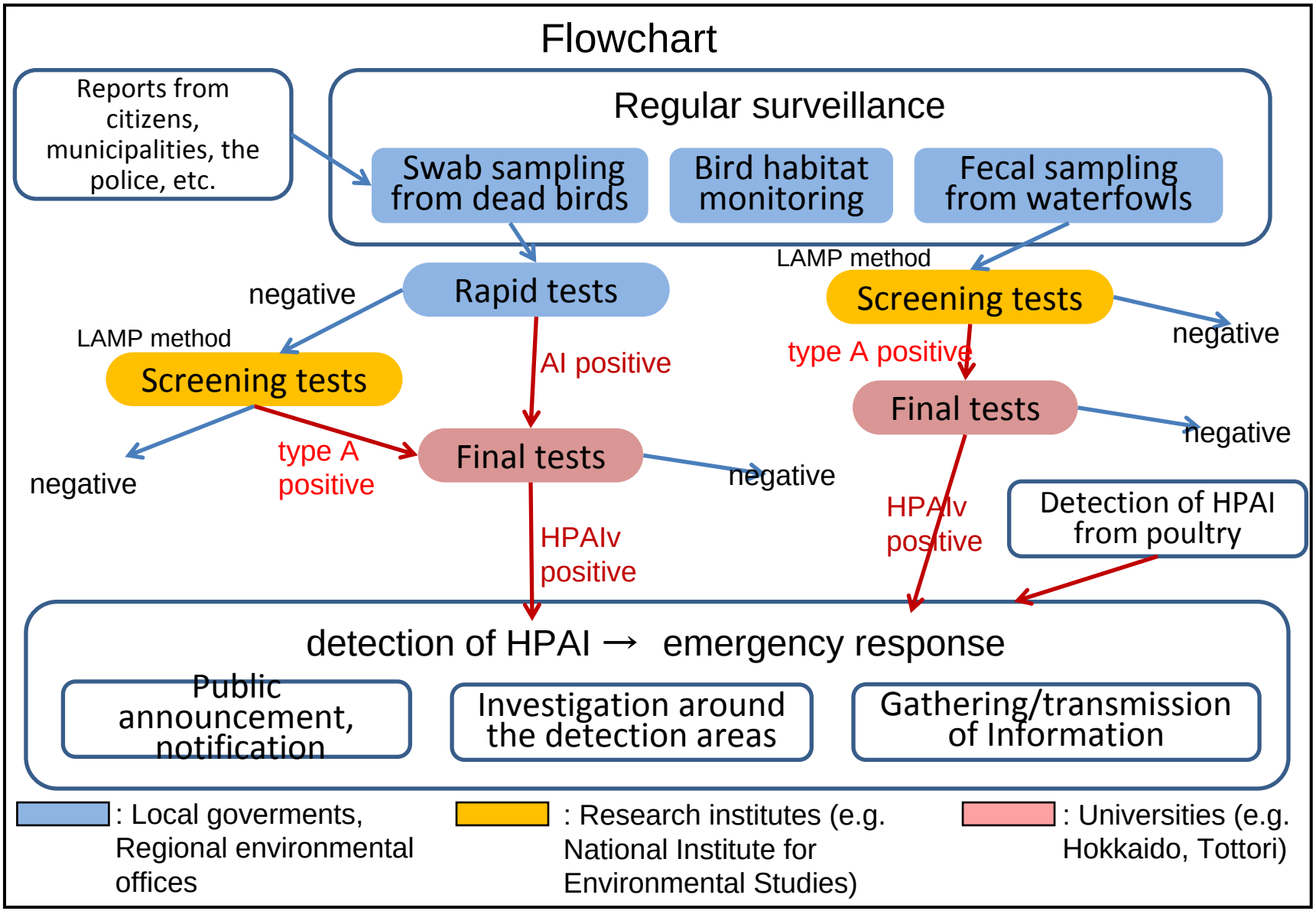




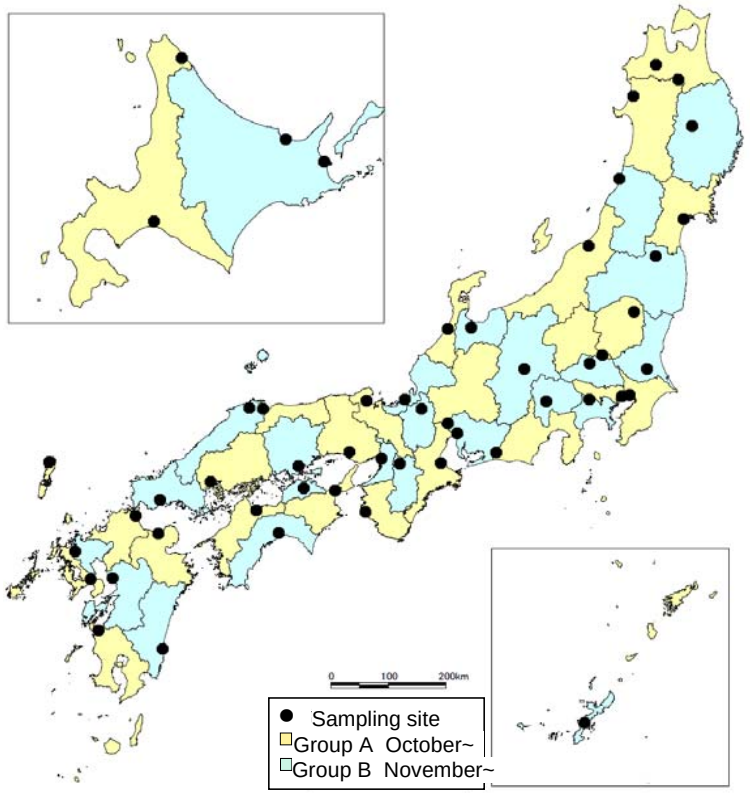
http://www.env.go.jp/nature/dobutsu/bird_flu/migratory/ap_wr_transit/index.html

3. Monitoring of AI in wild birds

Manual of technique and coping with HPAI in wild birds



3. Fecal sampling from waterfowls



- from October to May since 2008
- 52 locations in 47 prefectures
- About 100 samples at one location and one time (about 5 fecal samples pooled in 1 test tube)

調 査 用 紙 (サ ン プ ル (糞) 採 取 用)

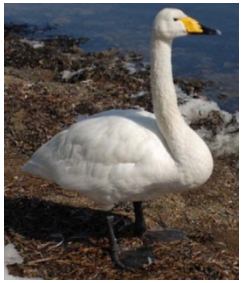
Sampling sheet

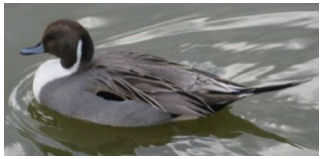
Japan Wildlife Research Center

Japan Wildlife Research Center

3. Swab sampling from dead birds

- Cloacal and trachial swabs
- Sampling all year around according to classification of the risk species and alert level
- About 600 species of birds
- For efficient monitoring
- Prioritize sampling species according to past experiences and reports





Teruaki Ishii

	Order	Family	Species
Risk 1	Anseriformes	Anatidae	Mute swan Whooper swan Tundra swan Greater white-fronted goose Aleutian canada goose Bean goose Tufted duck Mandarin duck Dichs with
	Falconiformes	Accipitridae	Northern Goshawk Eastern marsh harrier Eastern Buzzard Mountain Hawk-eagle Grey-faced buzzard Sparrowhawk White-tailed eagle Steller's sea eagle
		Falconidae	Peregrine Falcon Common Kestrel
Risk 2	Anseriformes	Anatidae	Mallard Northern Pintail Common pochard Greater Scaup
	Podicipediformes	Podicipedidae	Little grebe Great Crested Grabe Black-necked Grabe
	Gruiformes	Gruidae	Red-crowned crane Hooded crane White-naped crane
		Rallidae	Black coot Common Moorthen
	Charadriiformes	Laridae	Black-headed gull
	Strigiformes	Strigidae	Eurasian eagle owl Eurasian Scops-owl Ural owl
Risk 3	Pelecaniformes	Phalacrocoracidae	Great Cormorant
	Ciconiiformes	Ardeidae	Grey heron, Great egret, Cattle Egret, Night heron etc.
	Anseriformes	Anatidae	except for risk 1 and 2
	Charadriiformes	Laridae	except for risk 1 and 2
	Falconiformes		except for risk 1 and 2
	Strigiformes		except for risk 1 and 2

Emergency surveillance

Public announcement, notification

• Ministry of the Environment and local governments

•Infectious diseases control law

Japan Wildlife Research Center

Investigation around the detection areas

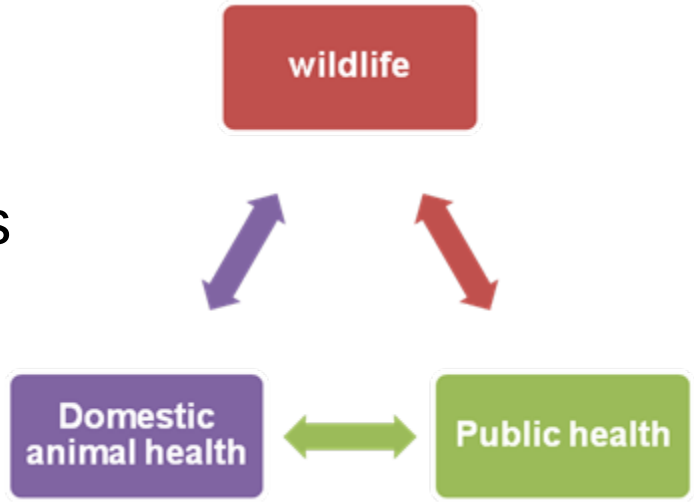
•within 10 km radius

•High priority dead birds sampling

Gathering/ sharing Information

•Information sharing with the divisions of domestic animal health and public health (e.g. the Domestic Animal Infectious Diseases Control Law)

•Provide information for citizens



Results of surveillance（since 2008）

	Season	2008-09 (Oct.-Sep.)	2009-10 (Oct.-Sep.)	2010-11 (Oct.-Sep.)	2011-12 (Oct.-May)
Regular fecal sample	Total No.	13,528	13,879	13,943	13,536
	HPAIv	0	0	0	0
	LPAIv	19	14	12	30
Emergency fecal sample	Total No.	100*1	130*2	10,248	0
	HPAIv	0	0	0	
	LPAIv	0	0	25	
Dead bird sample	Total No.	517	185	5,649	404
	HPAIv	0	0	60	0
	LPAIv	0	0	0	2
Emergancy Living bird sample	Total No.	101*1	100*2	100*3	0
	HPAI v	0	0	0	
	LPAIv	0	0	0	

HPAIv : H5N1 subtype
LPAIv : LPAIv and other AIv
*1 surveillance due to a whooper swan' s positive case in Aomori
*2 surveillance due to LPAL outbreak in domestic quails in Aichi
*3 surveillancw due to a tundra swan's positive case in Tottori

LPAIv isolated from fecal samples of wild birds (2011-2012 season)

30 strains were isolated from 27 test tubes (about 135 fecal samples pooled) from October 2011 to February 2012.

H1N1 (1), H1N3 (1), H2N3 (1), H3N8 (1), H4N6 (10), H7N1 (2), H7N3 (1), H7N7 (10), H10N6 (2), H10N8 (1)

Monthly number of isolated strains from fecal samples

		Oct.	Nov.	Dec.	Jan.	Feb.	Mar.	Apr.	May	Jun.	Total
2011-2012	No. of isolated strains	12	1	9	5	3	0	0	0		30
	Total No. of sample	2,524	1,922	1,912	1,978	2,170	1,640	1,270	120	0	13,536
2010-2011	No. of isolated strains	0	9	0	3	1	0	0	0		13
	Total No. of sample	1,675	2,175	2,241	2,167	2,034	1,711	1,648	292	0	13,943
2009-2010	No. of isolated strains	3	5	0	3	3	0	0	0	0	14
	Total No. of sample	1,532	2,186	2,107	2,559	2,095	1,765	1,291	264	80	13,879
2008-2009	No. of isolated strains	6	8	0	1	1	3	0	0		19
	Total No. of sample	1,832	1,918	2,286	2,222	2,300	1,779	977	214	0	13,528

LPAIv isolated from dead wild birds (2011-2012 season)

Bird species : Tundra swan (*Cygnus columbianus*)
Number of birds : 1
Bird condition : dead (the cause of death is unknown)
Collected date : November /7 /2011
Collected place : Matsue, Shimane Prefecture, Japan
Detected agent : Low pathogenic avian influenza virus
Serotype : H5N2 subtype
Confirmation date: December /15 /2011 (by genetic test)

Bird species : Spotbill duck (Anas poecilorhyncha)
Number of birds : 1
Bird condition : dead (the cause of death is unknown)
Collected date : February /29 /2012
Collected place : Takizawa village, Iwate Prefecture, Japan
Detected agent : Low pathogenic avian influenza virus
Serotype : H7N1 subtype
Confirmation date: March /5 /2012 (by genetic test)

Country poster presentation
JAPAN

Noriyoshi OJIMA, DVM

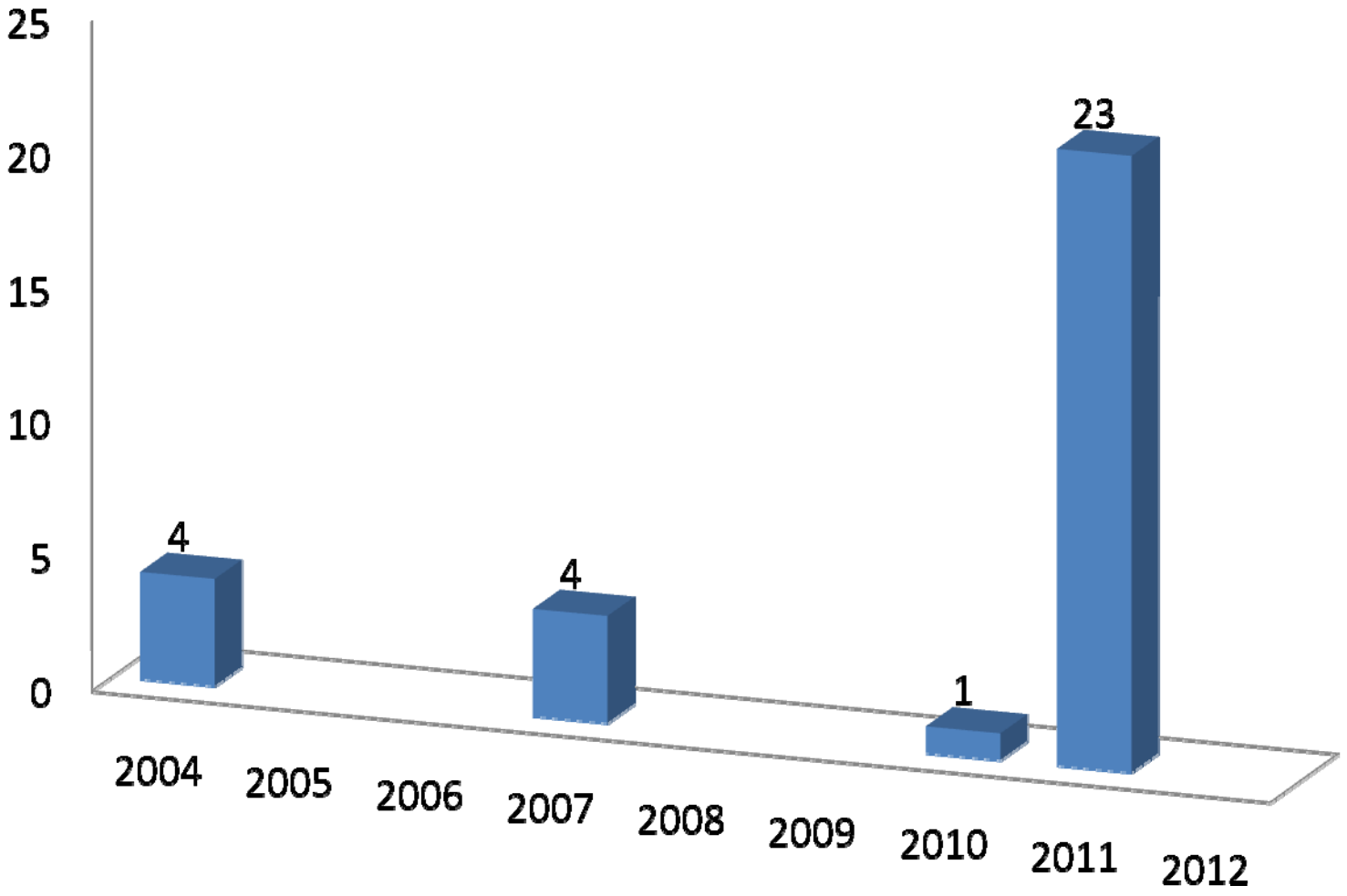
Animal Health Division

Ministry of Agriculture, Forestry and Fisheries

The 5th OIE Regional Expert Group Meeting for Implementation of the Programme on Surveillance of Wild and Domestic Birds along Migratory Flyways

Tokyo, Japan, 13-14 December 2012

H5N1 outbreaks in domestic birds in the last 5 years



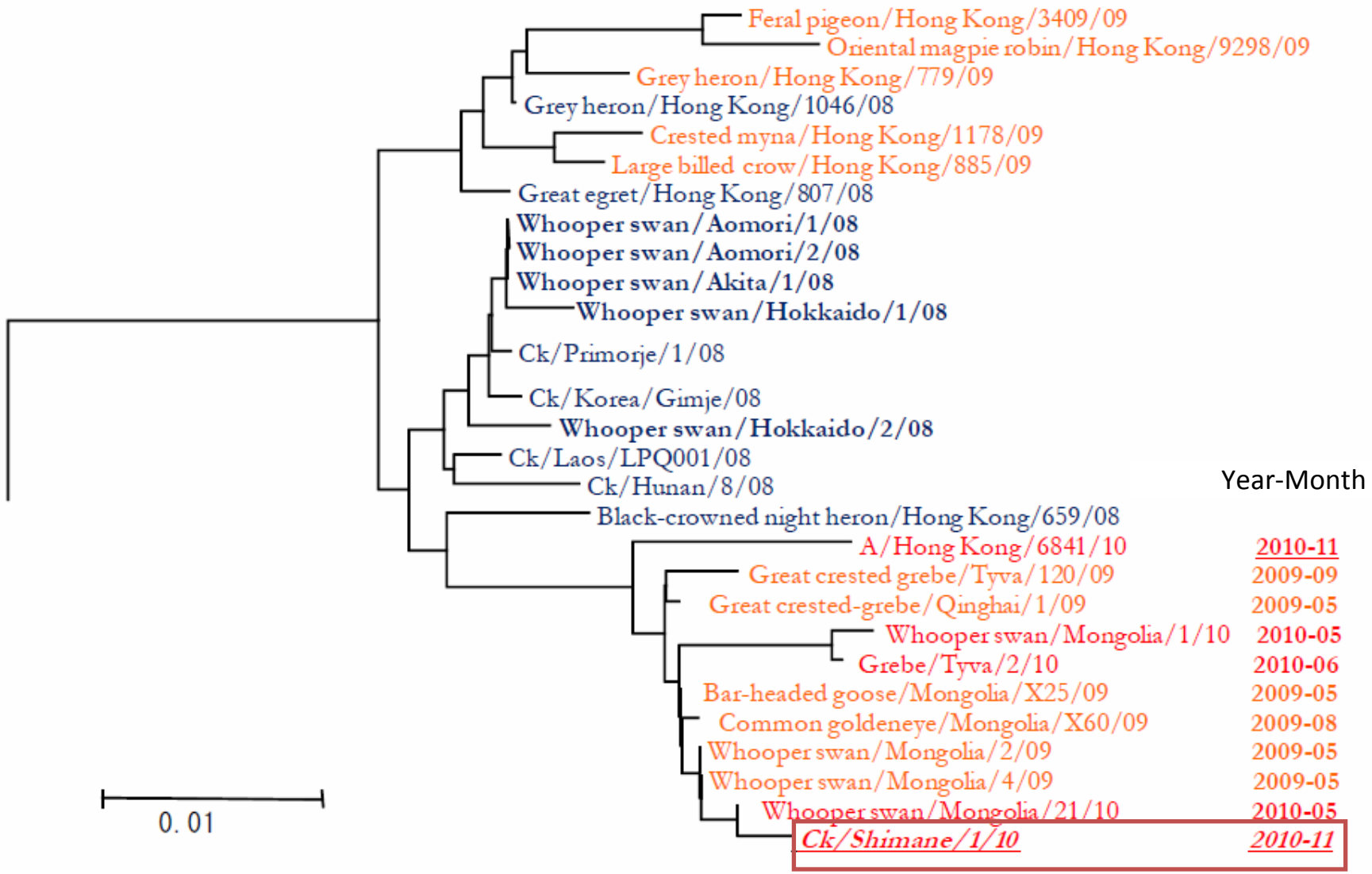
Overview of the recent HPAI outbreaks in domestic birds in Japan (2010-2011)

- There were 24 outbreaks of HPAI in 9 prefectures between November 2010 and March 2011, all of which occurred in commercial farms.
- A total of 1,850 thousand poultry were affected and all destroyed.
- Vaccination against AI had been prohibited.
- Japan declared itself free from notifiable avian influenza with effect from 25 June 2011.

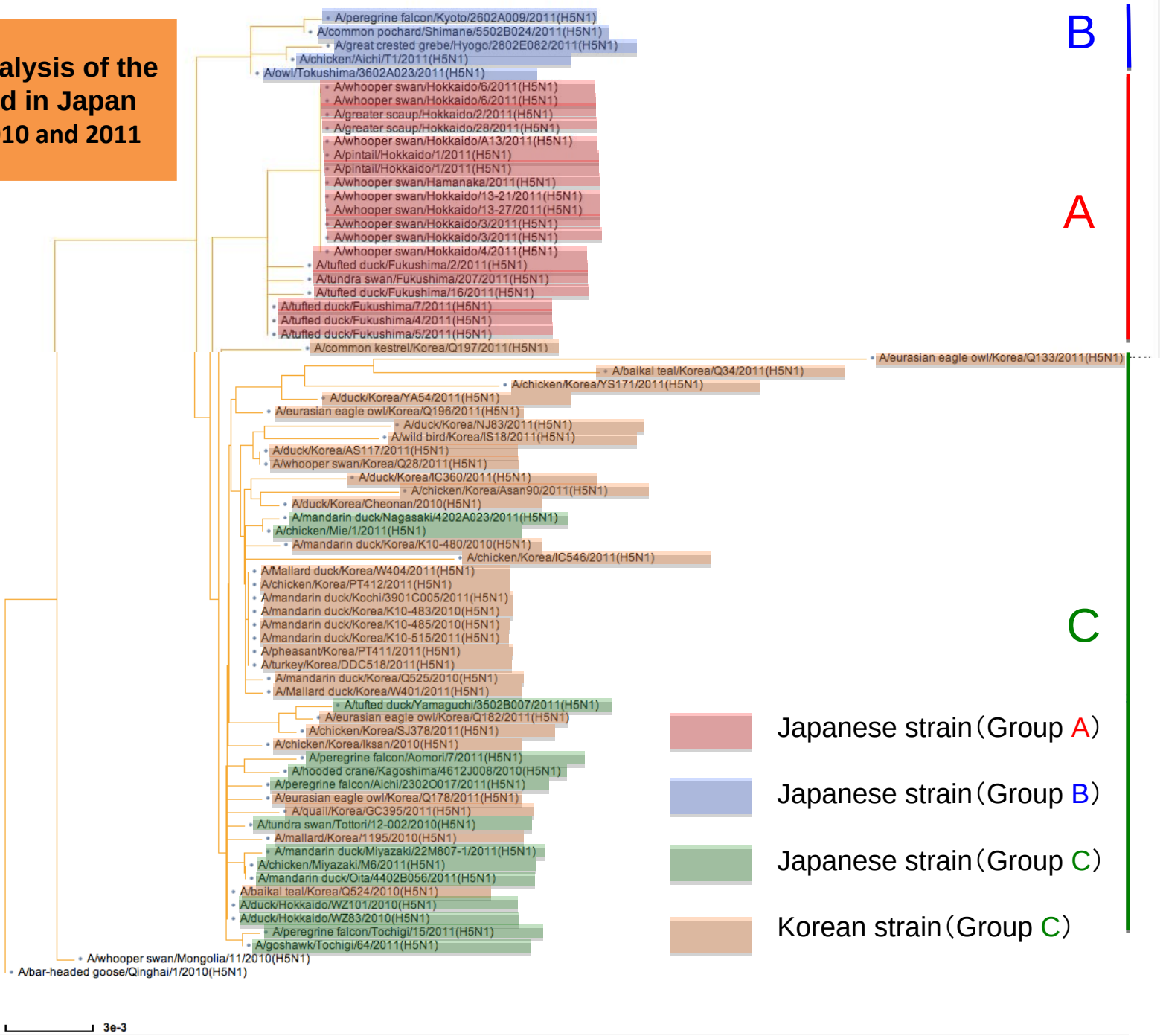
【Epidemiology】

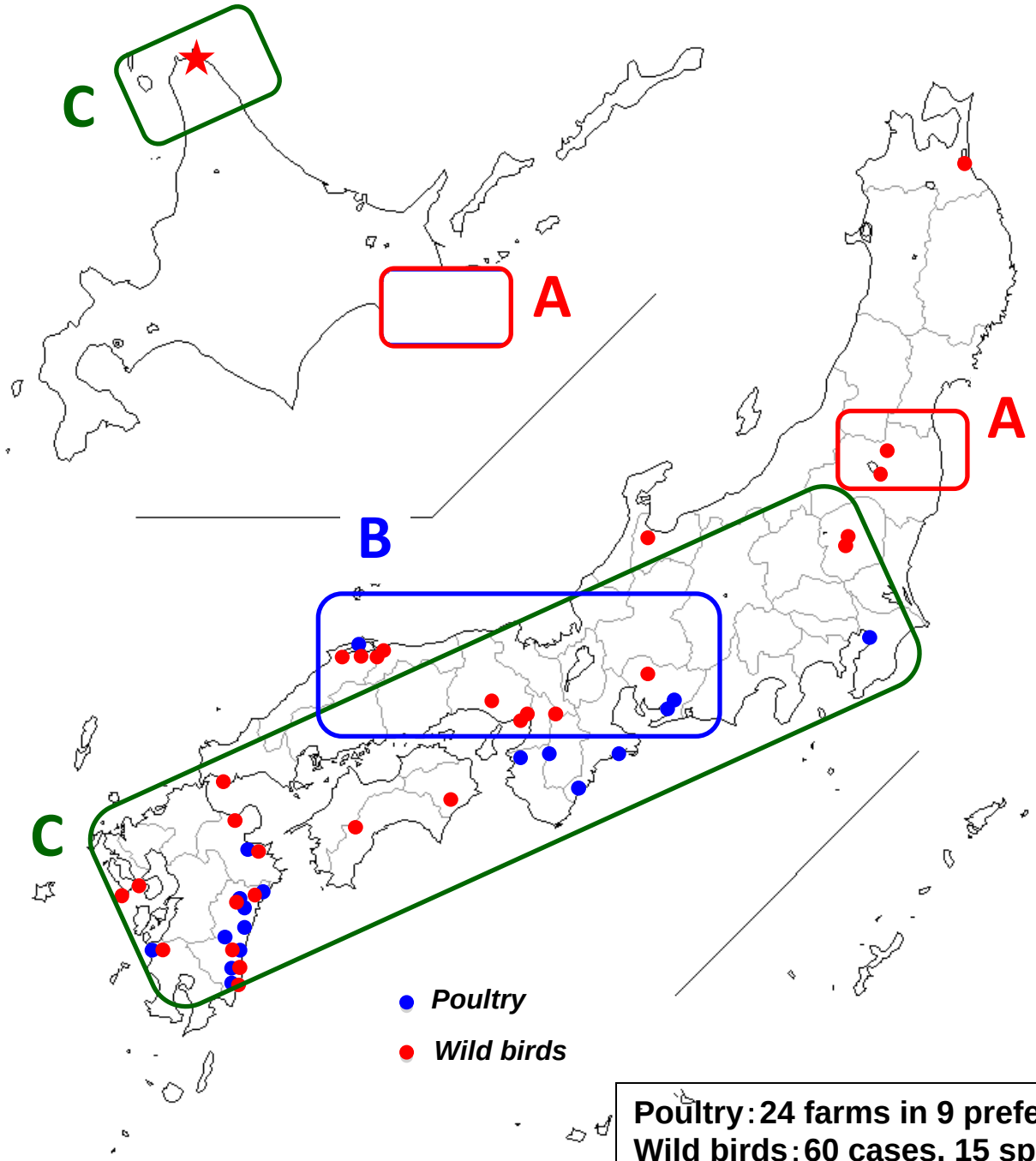
- In October 2010, HPAI virus was isolated from feces of wild ducks in Hokkaido.
- The isolates from the cases are classified into clade 2.3.2 and closely-related strains with the viruses isolated in Hokkaido.
- Seven out of 24 outbreaks were located near lakes, rivers and/or ponds inhabited by wild waterbirds.

Phylogenetic analysis of the virus isolated in Shimane, Japan in 2010

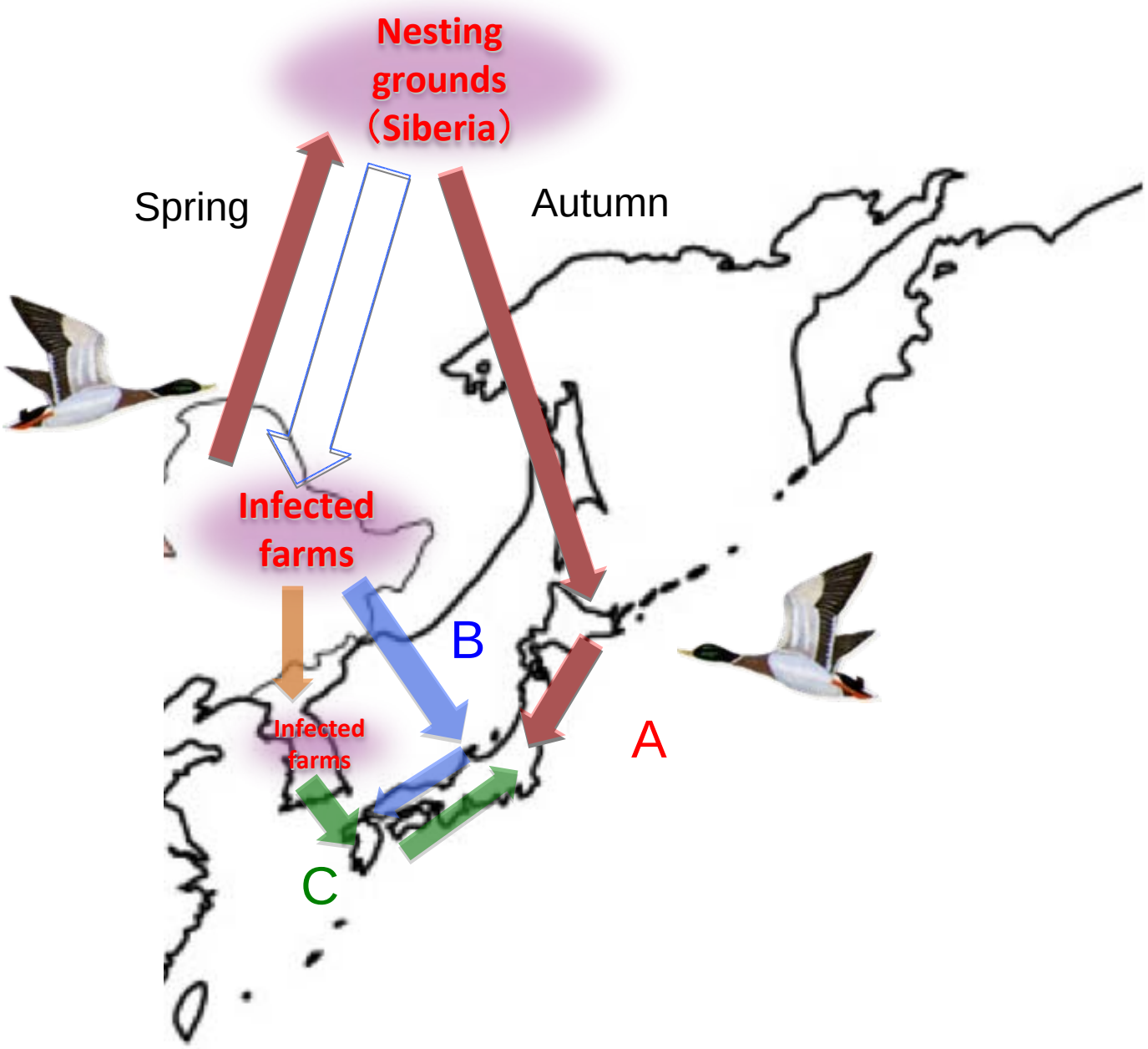


Phylogenetic analysis of the viruses isolated in Japan and Korea in 2010 and 2011





Poultry：**24 farms in 9 prefectures**
Wild birds：**60 cases, 15 species in16 prefectures**



Flying routs of migratory birds and virus spreading（hypothesis）

Active surveillance on domestic birds

- Each prefectural veterinary authority has local veterinary service centers, which put control measures in the front line and give producers guidance. As of 1 July 2012, a total of 171 local veterinary service centers are established in Japan.
- Each local veterinary service center will do and has been doing both **fixed point monitoring** and **intensive monitoring** as surveillance for early detection of poultry diseases such as Avian influenza.
- For **the fixed point monitoring**, at least 3 farms are selected by each center among high risk farms such as those located around places where wild birds come flying, and at least 10 samples are collected for antigen and antibody tests from each farm every month.
- For **the intensive monitoring**, target farms are selected randomly at a level sufficient to detect 10% prevalence with at least 95% level of confidence, and at least 10 samples are collected for antibody tests from each farm.
- In addition, Avian influenza is notifiable in Japan by law. Owners or private veterinarians must report it if they find suspicious cases or confirm that the number of dead poultry per day increase more than twice than the average number of those during 21 days before the day.

Fixed point monitoring

1. Frequency: once a month
2. Timing: all the year round
3. Target species: poultry
4. Target premises: at least 3 farms are selected by each local veterinary service center among high risk farms
5. Sample scale: at least 10 birds/farm
6. Sample category: cloacal and tracheal Swab, blood and viscera of dead poultry
7. Target serotype of influenza A virus: H5, H7 and others
8. Testing method: virus isolation and serological test
9. Next step in case of positive: clinical inspection, genetic analysis, virus isolation (retest), serological test (retest)

Intensive monitoring

1. Frequency: schedule designed, taking coming flying of migratory birds into account
2. Timing: from October to May in principle
3. Target species: poultry
4. Target premises: selected randomly at a level sufficient to detect 10% prevalence with at least 95% level of confidence, among those which has no less than 100 poultry or no less than 10 ostrich
5. Sample scale: at least 10 birds/farm
6. Sample category: blood
7. Target serotype of influenza A virus: H5, H7 and others
8. Testing method: serological test
9. Next step in case of positive: clinical inspection, genetic analysis, virus isolation, serological test (retest)

Active surveillance on domestic birds

Results of the surveillance

(July 2011-June 2012)

Month/Year	Fixed Point Monitoring			Intensive Monitoring		
	Farms	Poultry	Result	Farms	Poultry	Result
11/2011	527	5,279	Negative	364	4,070	Negative
12/2011	508	5,095	Negative	274	2,940	Negative
1/2012	526	5,278	Negative	208	2,130	Negative
2/2012	523	5,249	Negative	187	1,945	Negative
3/2012	524	5,258	Negative	107	1,005	Negative
4/2012	520	5,224	Negative	134	1,335	Negative
5/2012	517	5,181	Negative	207	2,070	Negative
6/2012	516	5,177	Negative	108	1,060	Negative
7/2012	518	5,199	Negative	103	1,040	Negative
8/2012	514	5,156	Negative	78	770	Negative
9/2012	519	5,209	Negative	82	790	Negative
10/2012	520	5,129	Negative	383	3,805	Negative