



Ministry of Environment  
National Institute of  
Wildlife Disease Control and Prevention

# **ASF management and Surveillance System for Wild Boars in Korea**

## **- Part 1 -**



Smart tracking and early detection to  
stop ASF before it spreads.



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**01.**

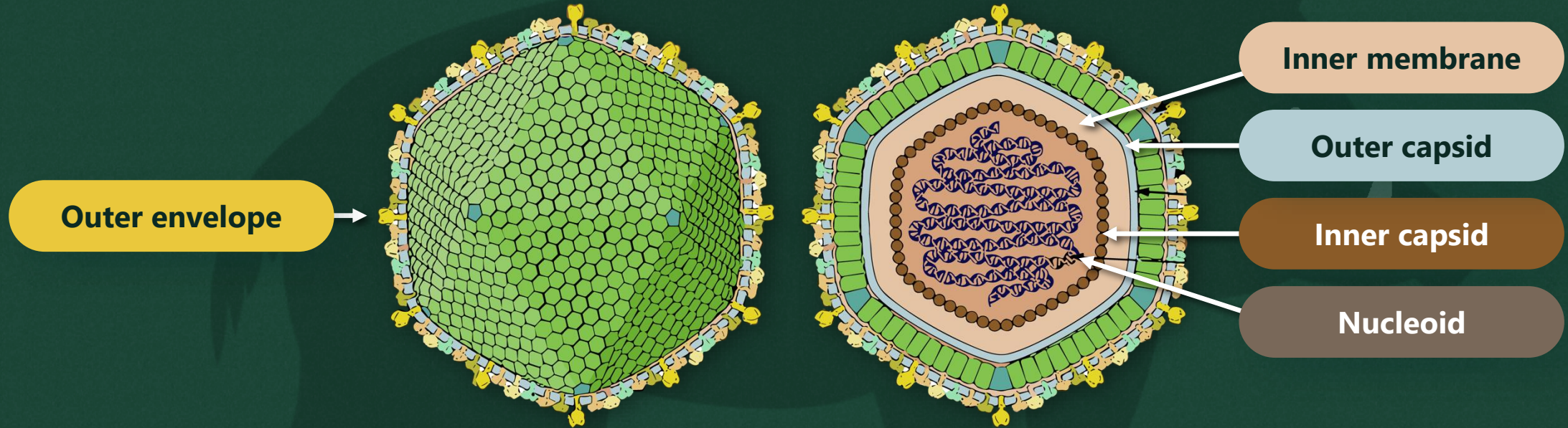
# **ASF Overview**

**1-1. Characteristics of the Virus**

**1-2. Transmission Characteristics**



# Virus Characteristics



Large double-strand DNA virus, **200nm diameter**

Only member of virus family the **Asfarviridae**

Genome length **170-190 kbp**

Encodes more than 150 proteins, unknown function



# Virus Characteristics



Exists in various clinical forms ranging from per-acute, acute, subacute to chronic

01



A hemorrhagic infectious disease affecting both wild boars and domestic pigs

02

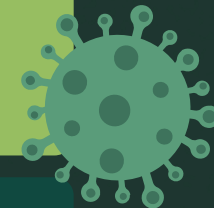


In Korea, the acute form with a 100% fatality rate is prevalent

03

No effective treatment or vaccine has been developed to date  
→ **ASF outbreaks result in significant social and economic damage**

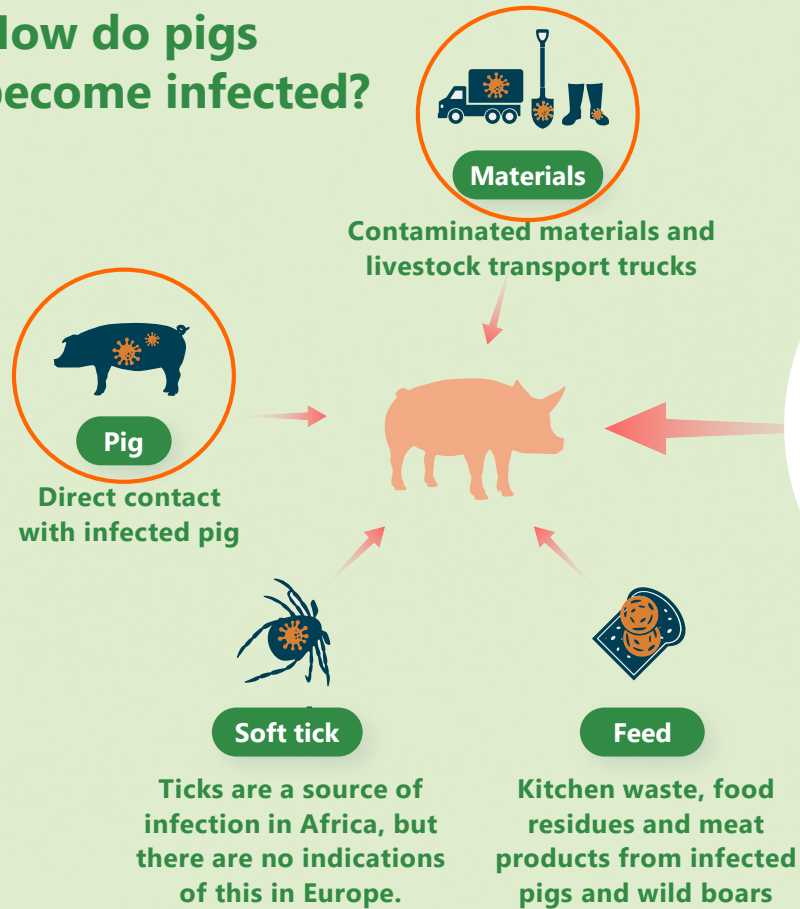
04



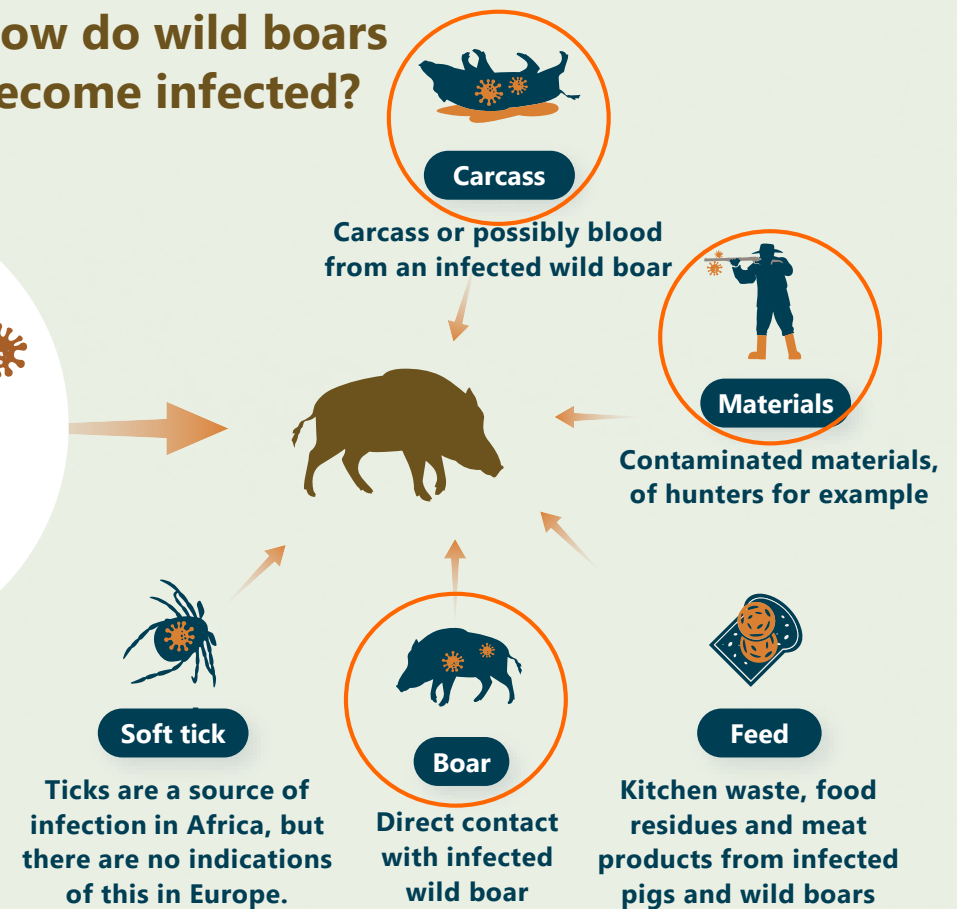


# Virus Characteristics

## How do pigs become infected?



## How do wild boars become infected?

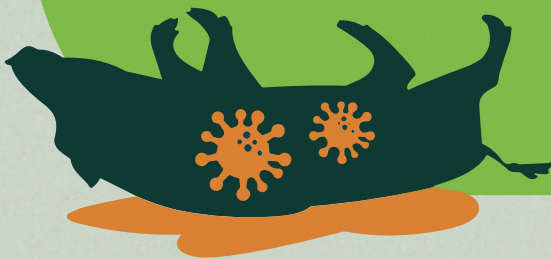




# Transmission Characteristics

## Natural Transmission

- ASF is transmitted through direct physical contact between infected and healthy individuals
- Transmission can also occur through contact with carcasses of infected animals



## Artificial Transmission

- Contamination from using the same sampling tools without proper sterilization
- Failure to disinfect vehicle-hunting dogs
- Illegal transport of carcasses
- Movement to other areas after hunting in firearm- or dog-restricted zones without proper reporting





02.



# Domestic and Global Outbreak Status

2-1. Global Outbreak Status

2-2. Entry of the Virus

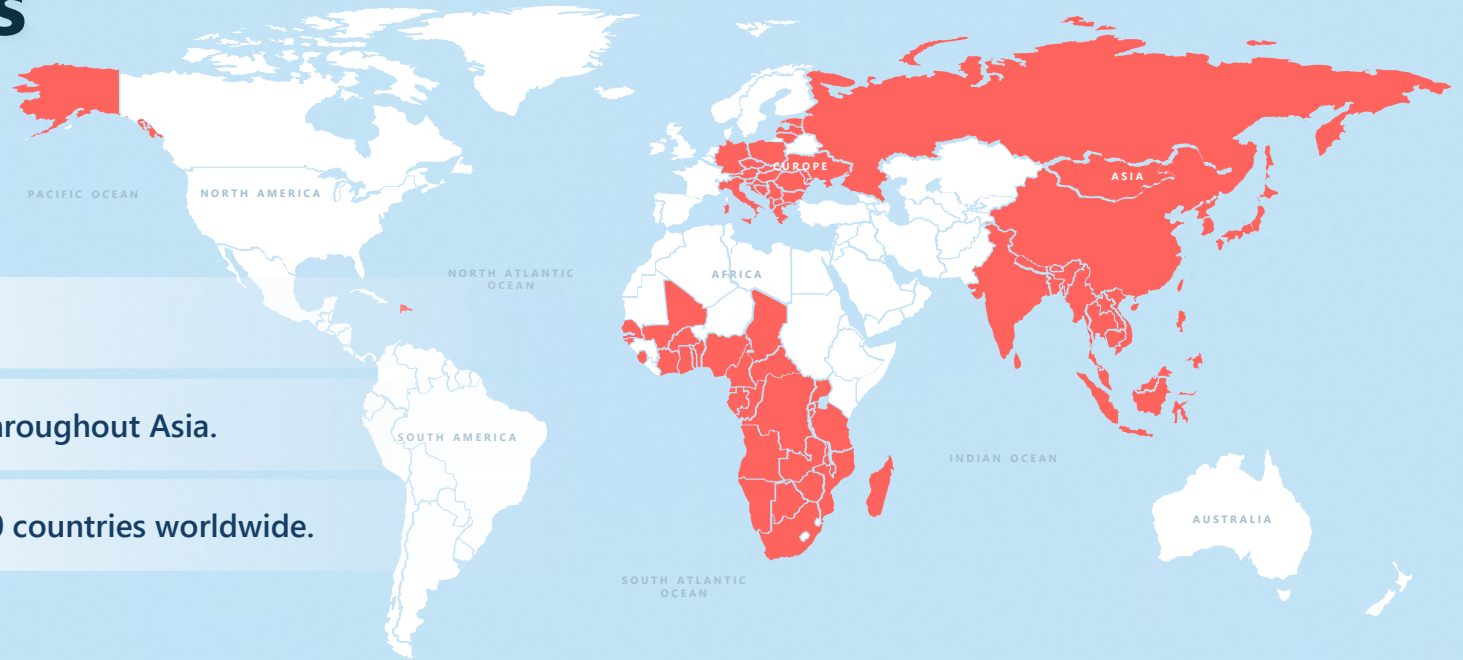
2-3. Transmission and Spread.





# Global Outbreak Status

1. In 2007, ASF spread from Africa to Europe(Georgia).
2. In 2018, it was transmitted to China and then spread throughout Asia.
3. Since 2018, ASF has been reported in approximately 80 countries worldwide.



## First Major ASF Outbreak

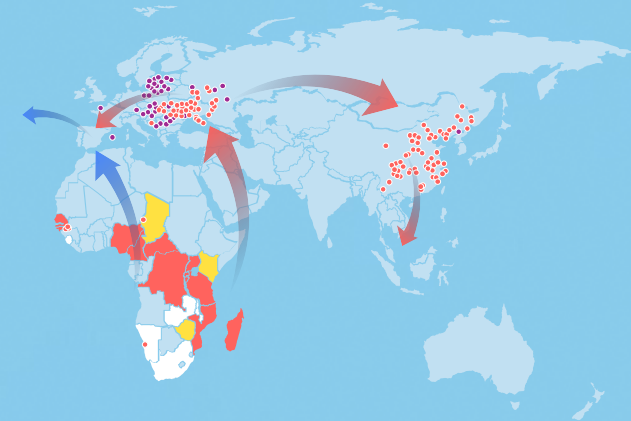
1957 ~ 1999 (Geno type I)



## The Second Wave of ASF Outbreaks

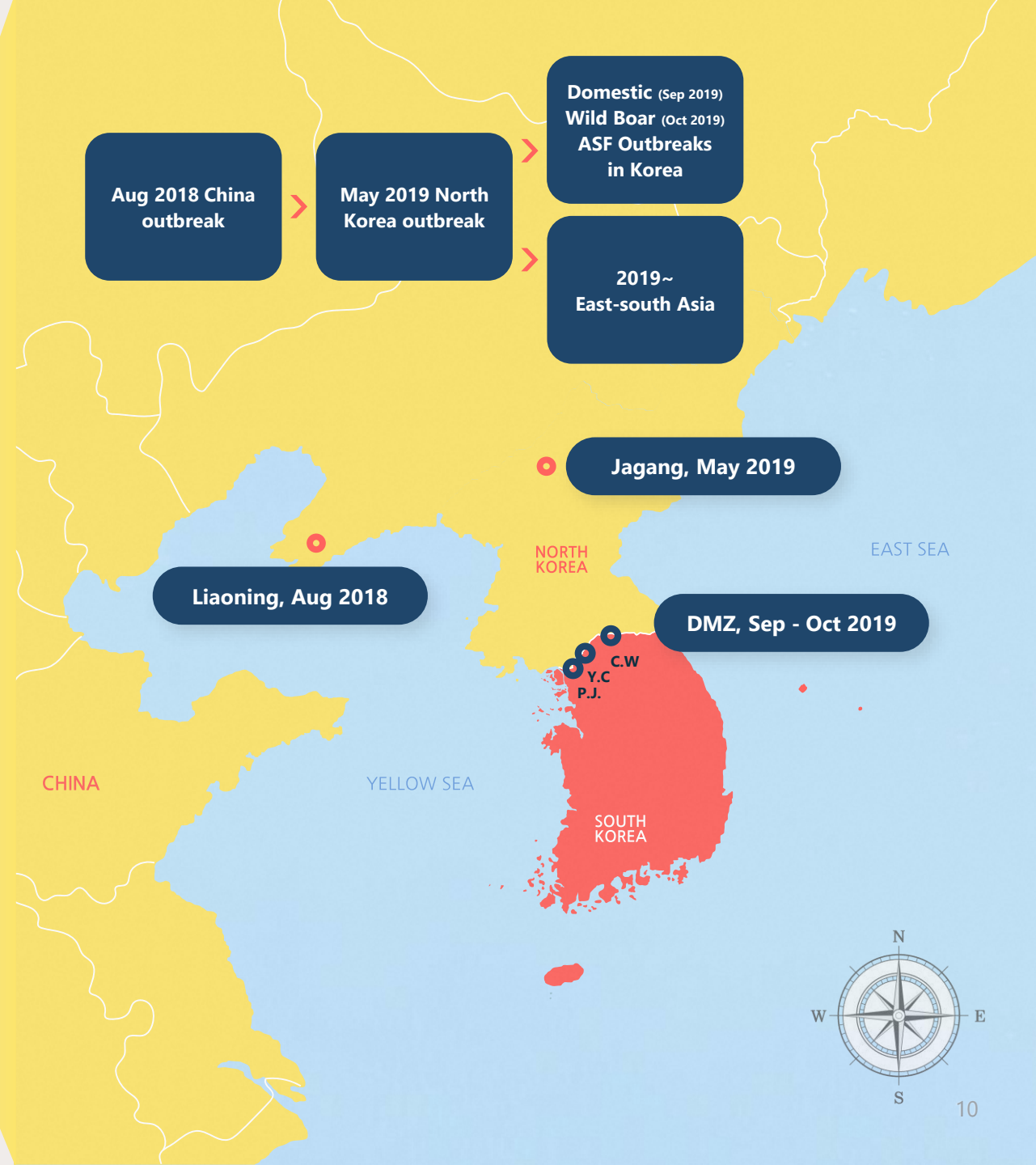
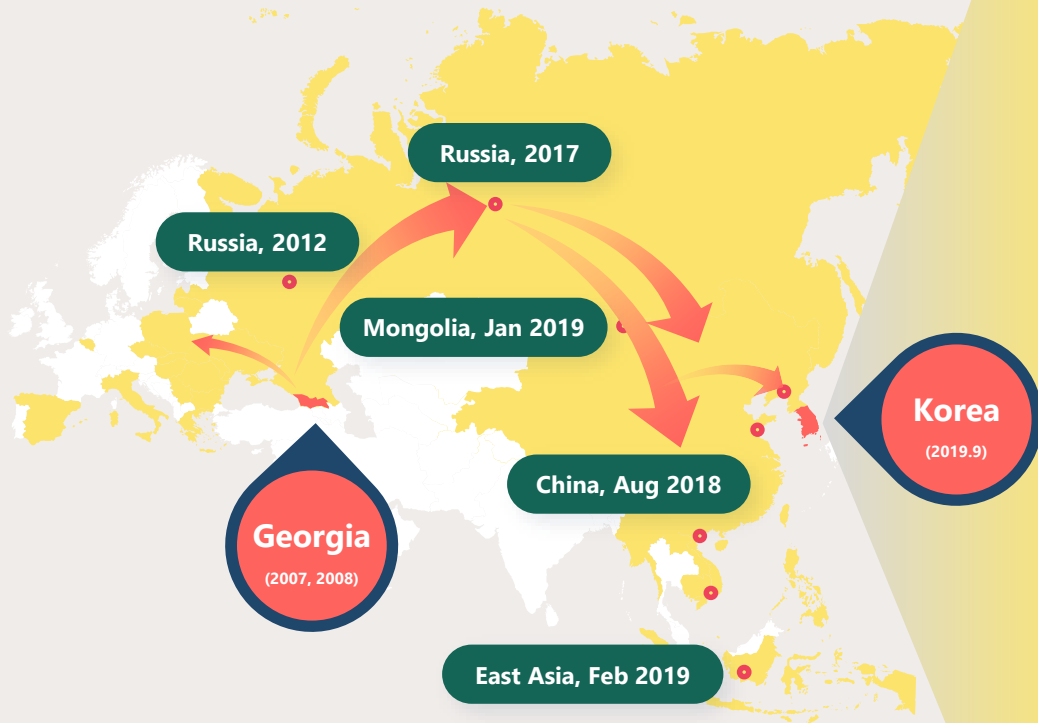
2007 ~ (Geno type II)

- ASF in domestic pigs
- ASF in Wild boar
- 
- 
- 



# Domestic Outbreak Status

Entry of ASF virus





# Domestic Outbreak Status

First case of ASF virus in Wild boar

2019.10.2 Pm 00:00

Report from a military unit : found a wild boar carcass in DMZ area

2019.10.3 Am 08:00

Confirmation of first ASF positive in wild boar



Found in military surveillance trail Altitude approx.  
172 meters 0.69km apart from the Northern limit line



First reported carcass found in DMZ,  
ASFv infection confirmed in Oct 3

위치 변경



Gangwon-do

Gyeonggi-do

Chungcheong  
buk-do

Chungcheong  
nam-do

Gyeongsang  
buk-do

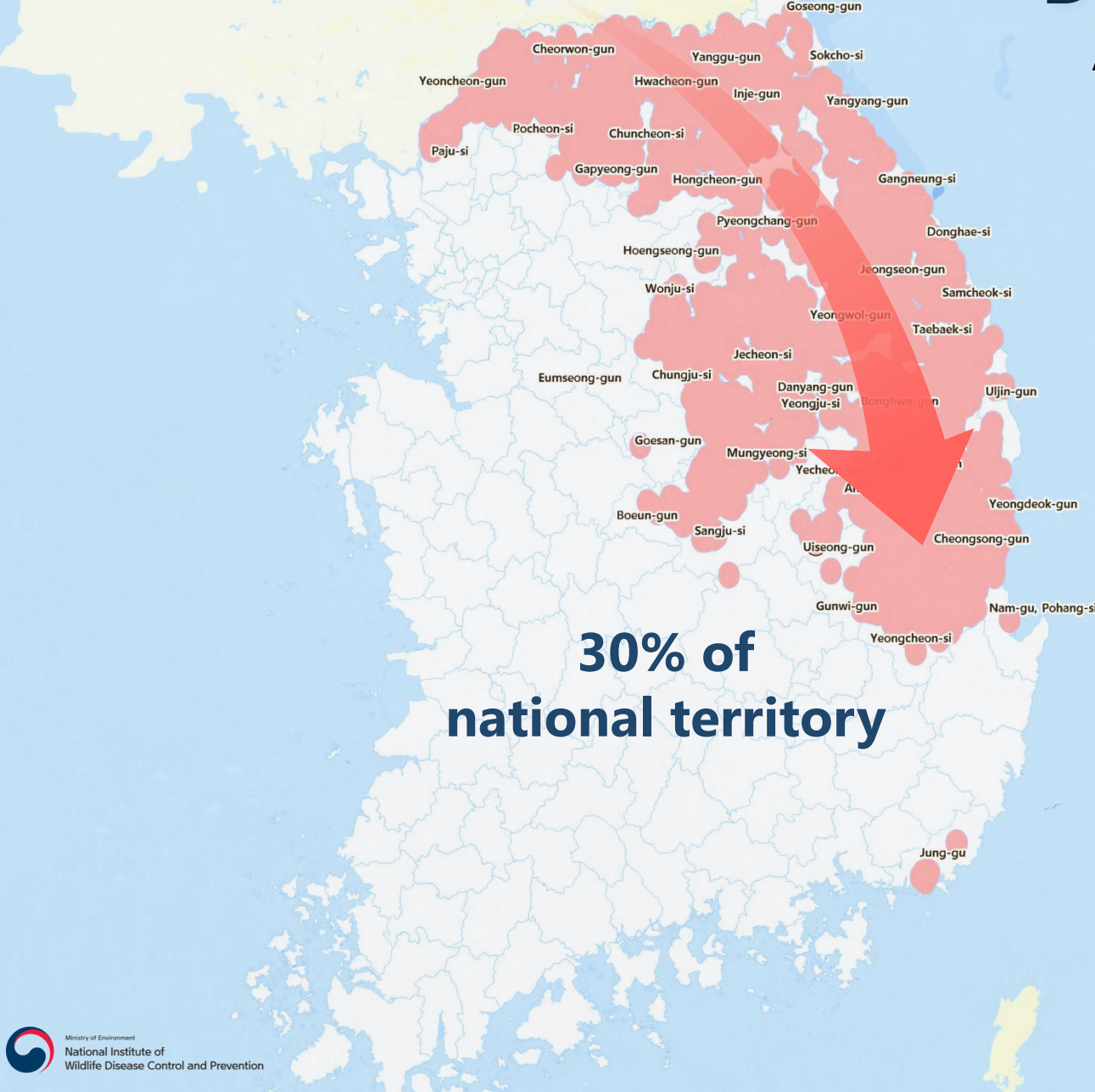
Jeolla  
buk-do

Gyeongsang  
nam-do



# Domestic Outbreak Status

ASF spreading in wild boar



**30% of  
national territory**

● ASF Contaminated areas

Development of ASF outbreak(2019 ~ Jun 2025)

months

**69**

Since first ASF detection  
in wild boar (Sep 2019)

cases

**4,254+**

Reported as of Jun 2025  
(4 provinces, 43 counties)

Spread Direction

**East & South**



## Analysis of ASF Outbreak Characteristics in Wild Boars

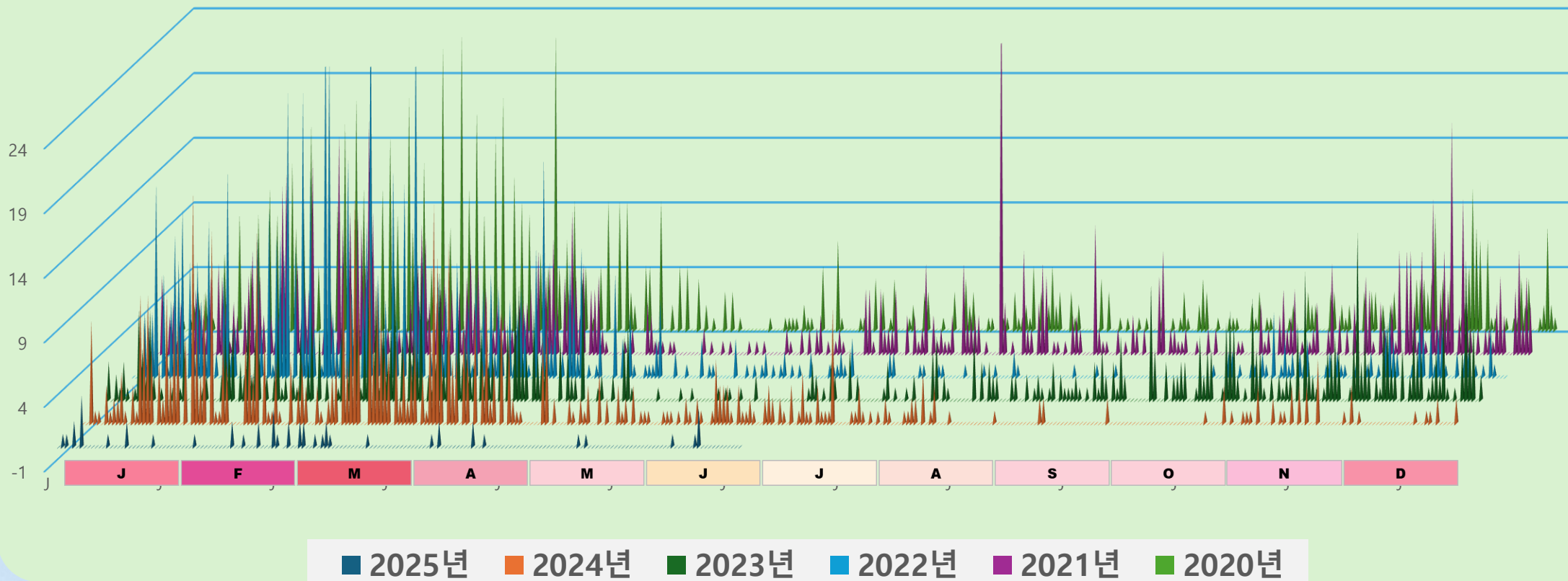


	January	February	March	April	May	June	July	August	September	October	November	December	Total
Season	Winter			Spring			Summer			Autumn		Winter	
2019	0			0			0			33		22	55
2020	217			359			96			105		79	856
2021	263			249			164			160		128	964
2022	380			362			41			53		42	878
2023	126			254			65			198		92	735
2024	239			337			96			35		12	719
2025	22			20			5			0		0	47
Sum	1247			1581			467			584		375	4254



# Analysis of ASF Outbreak Characteristics in Wild Boars

## Daily ASF Positive Cases in Wild Boars Since Year 2020



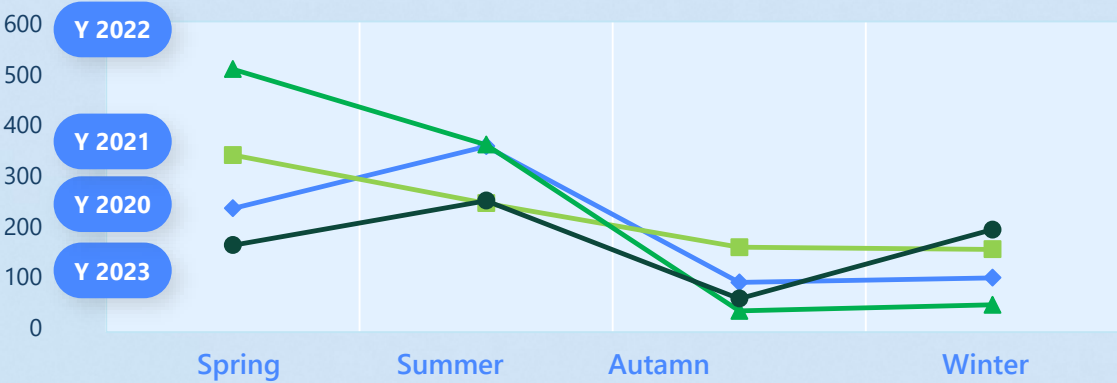


# Analysis of ASF Outbreak Characteristics in Wild Boars

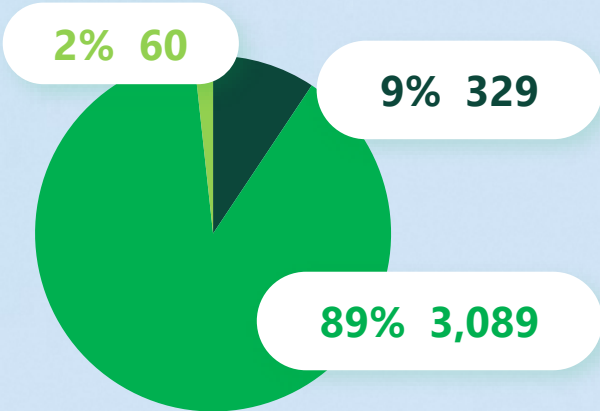
Seasonal patterns of ASF cases

Types of wild boar samples(~2023)

No. Positive



■ hunting  
■ carcass  
■ traps



Number of Cases by sex (F/M 1.11~1.37)

Year	2019	2020	2021	2022	2023	2024	2025	Total
Female	20	386	392	396	284	291	10	1,779
Male	17	280	287	290	251	205	9	1,339
Uncertainty	18	190	285	192	200	223	28	1,136
Total	55	856	964	878	735	719	47	4,254

## Phylogenetic tree and comparison of partial fragments of Korean ASFV isolates



Georgia



**Korea**



Russia



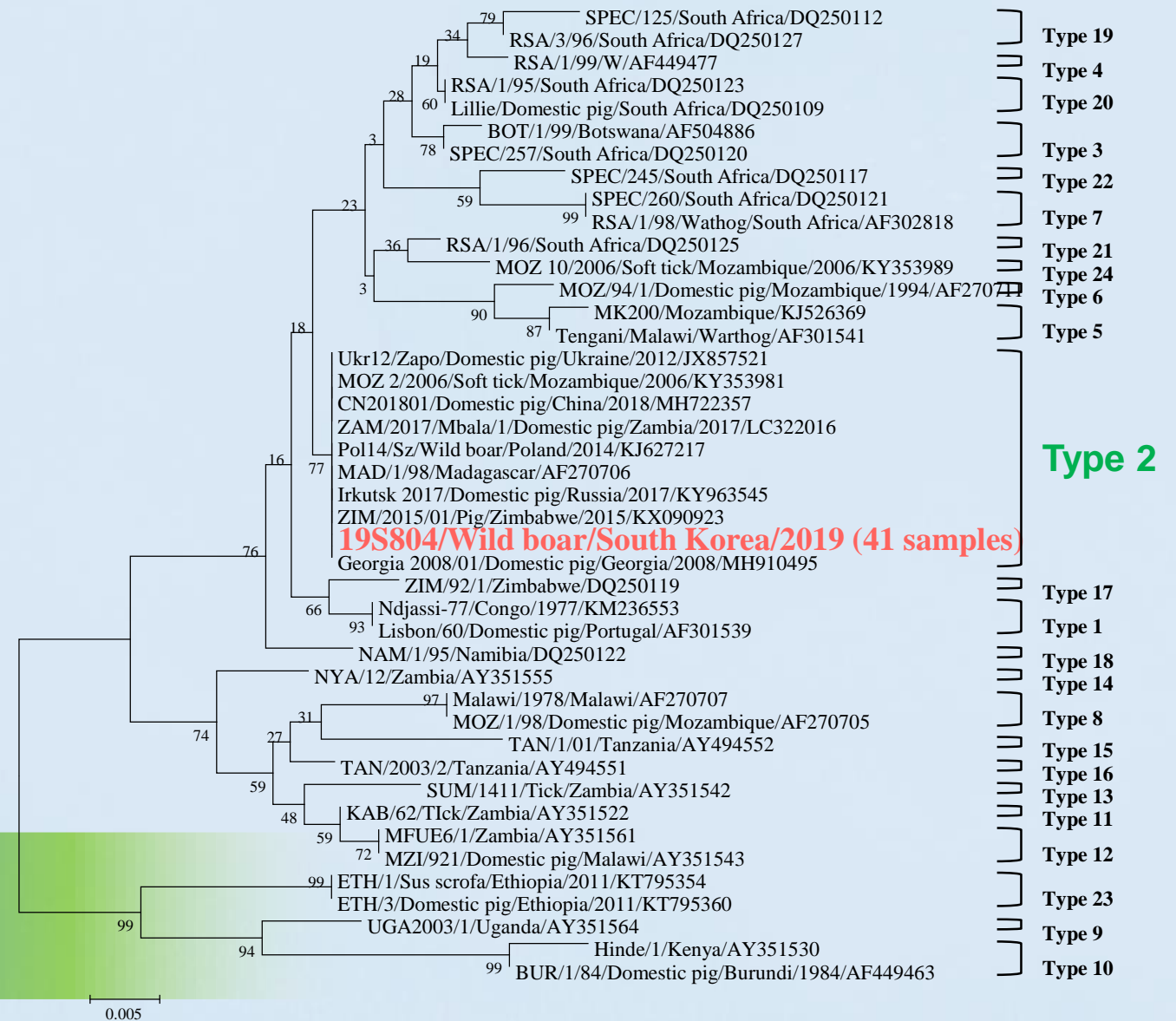
Ukraine



Poland

China

A. Phylogenetic relationship based in p72 encoding gene sequence.





GII, IGR II of China domestic /backyard pig

GII, IGR I of China wild boar

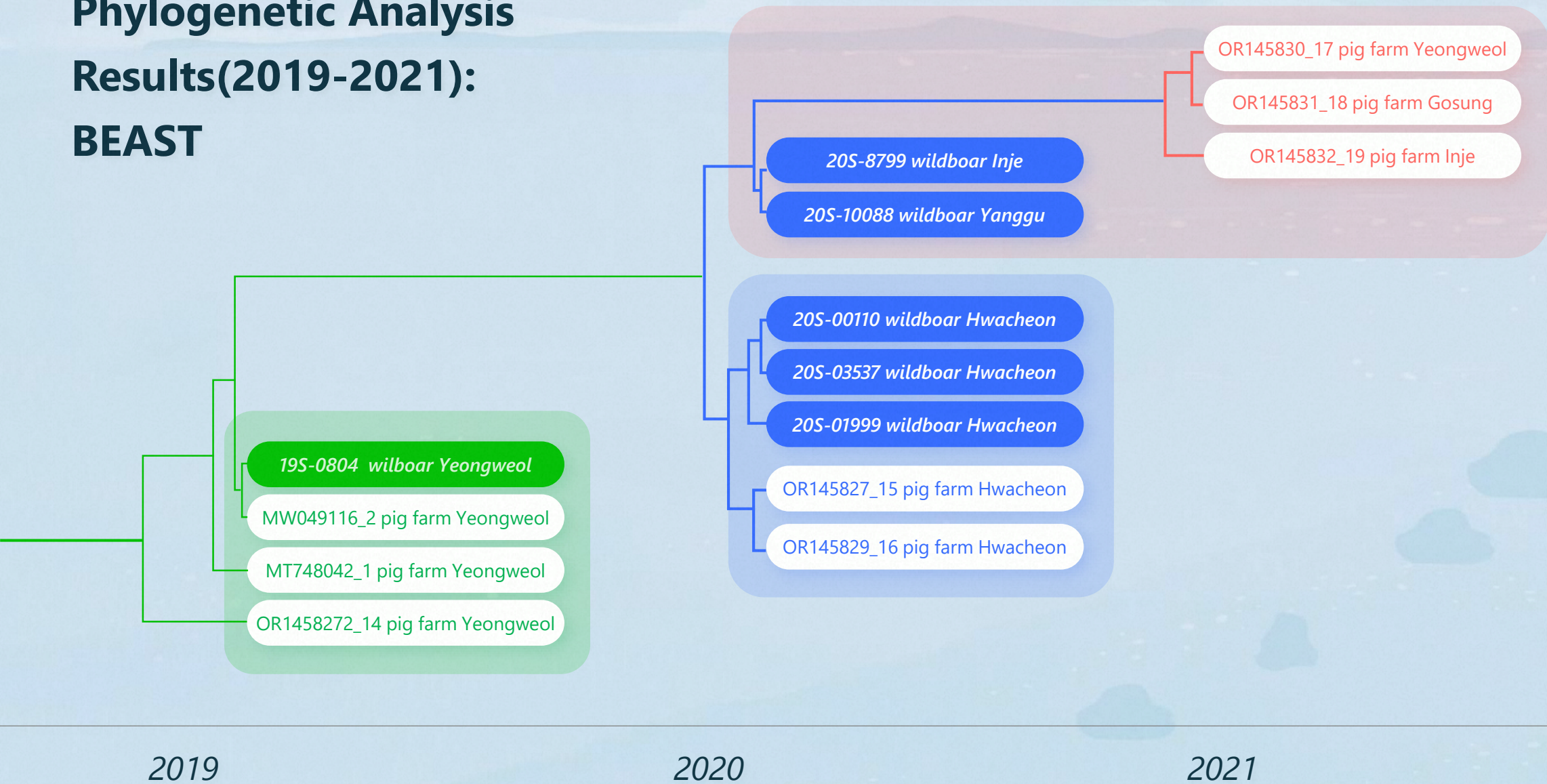
North Korea ?

GII, IGR II of South Korea wild boar

*B. Initial ASF outbreak locations of three countries*



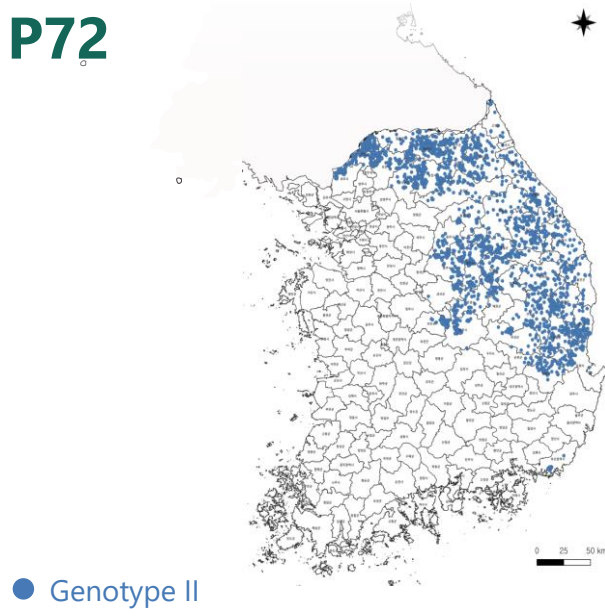
# Phylogenetic Analysis Results(2019-2021): BEAST



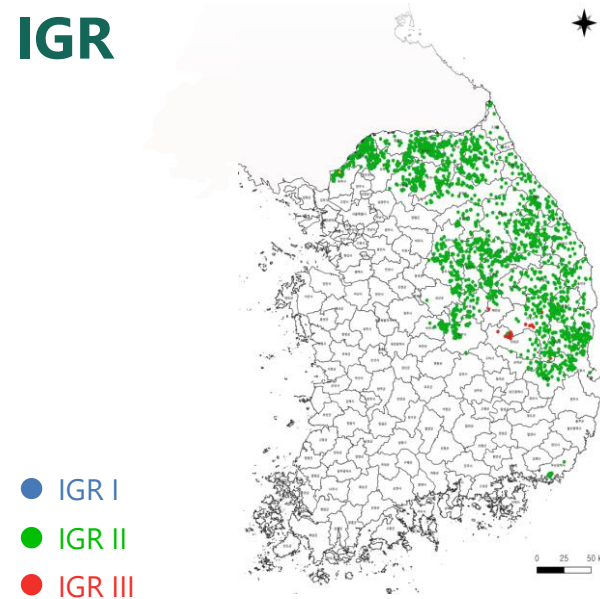


## Genetic analysis of ASFV (wild boar, 2019-2025)

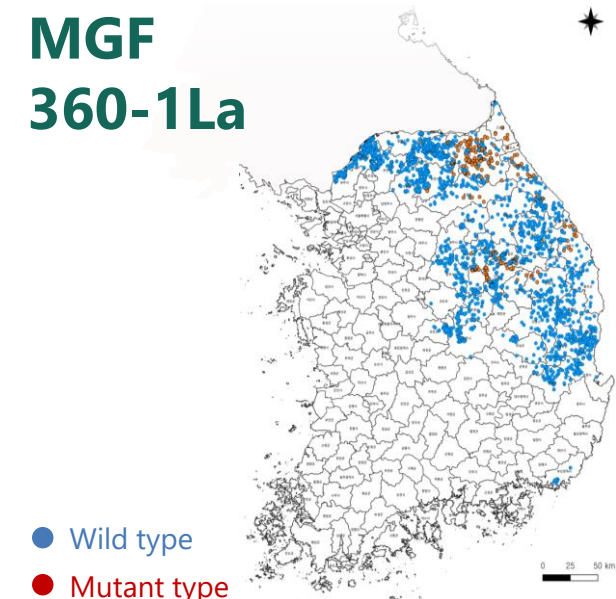
P72



IGR



MGF  
360-1La



1. ASFV strains in South Korea are Genotype II with limited genetic diversity.

2. However, mutations in **MGF360-1La** provide molecular markers for tracking regional spread and distinguishing clusters.

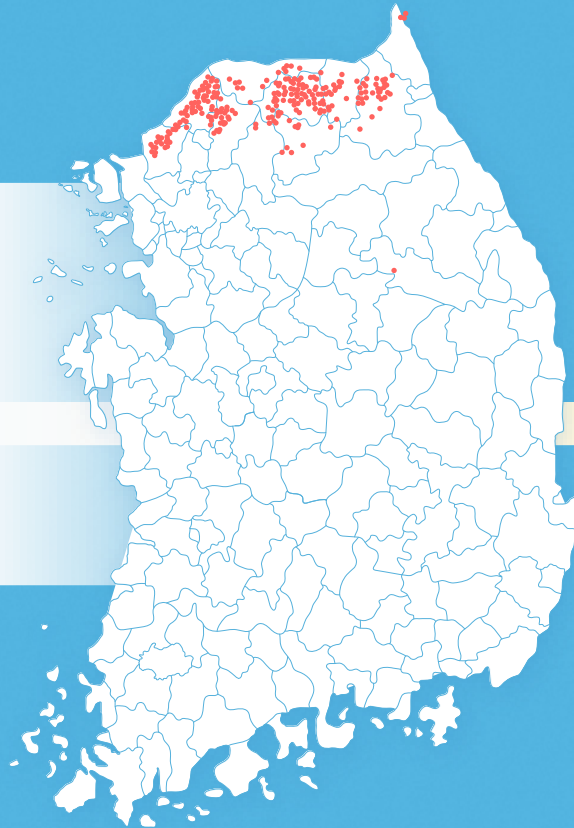
3. From 2019 to 2021, outbreaks spread **from the northwest to the northeast**, as supported by both whole genome and partial gene analyses.

# Timeline of ASF Virus Spread

2019 - 2020

**Spread along the  
Border areas into  
Gyeonggi and the  
northern region of  
Gangwon**

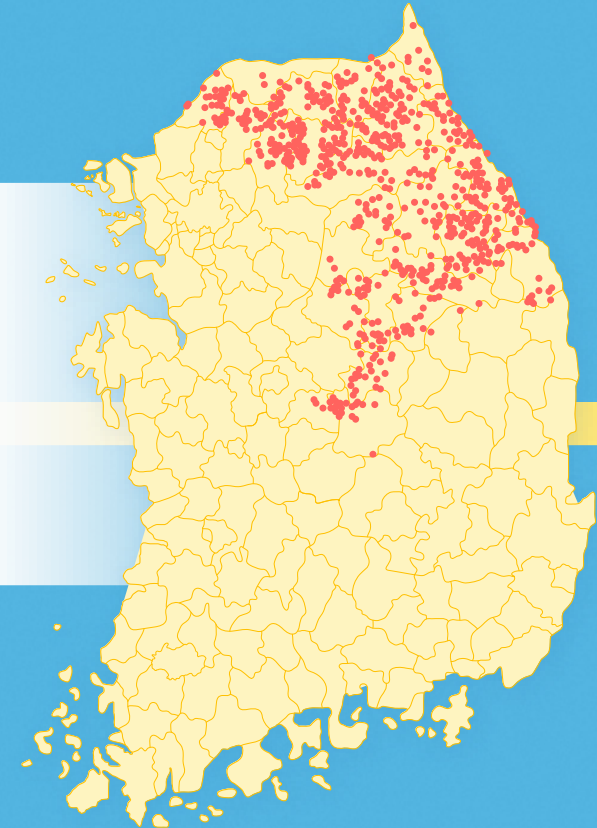
● ASF Outbreak Sites  
ASF Outbreak Sites (2019 - 2020)



2021 - 2022

**Continuously  
moved south along  
the mountainous  
terrain**

● ASF Outbreak Sites (2021 - 2022)



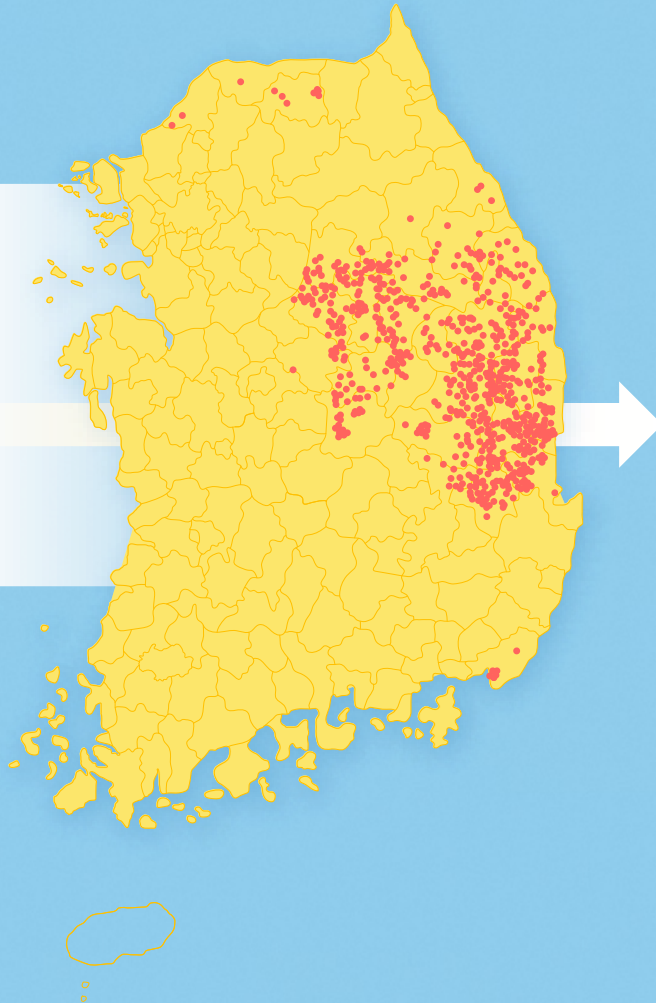


# Timeline of ASF Virus Spread

2023 - 2024

Occurred intensively  
in the middle-eastern  
region of the Korean  
Peninsula

● ASF Outbreak Sites  
ASF Outbreak Sites (2023 - 2024)



2025 -

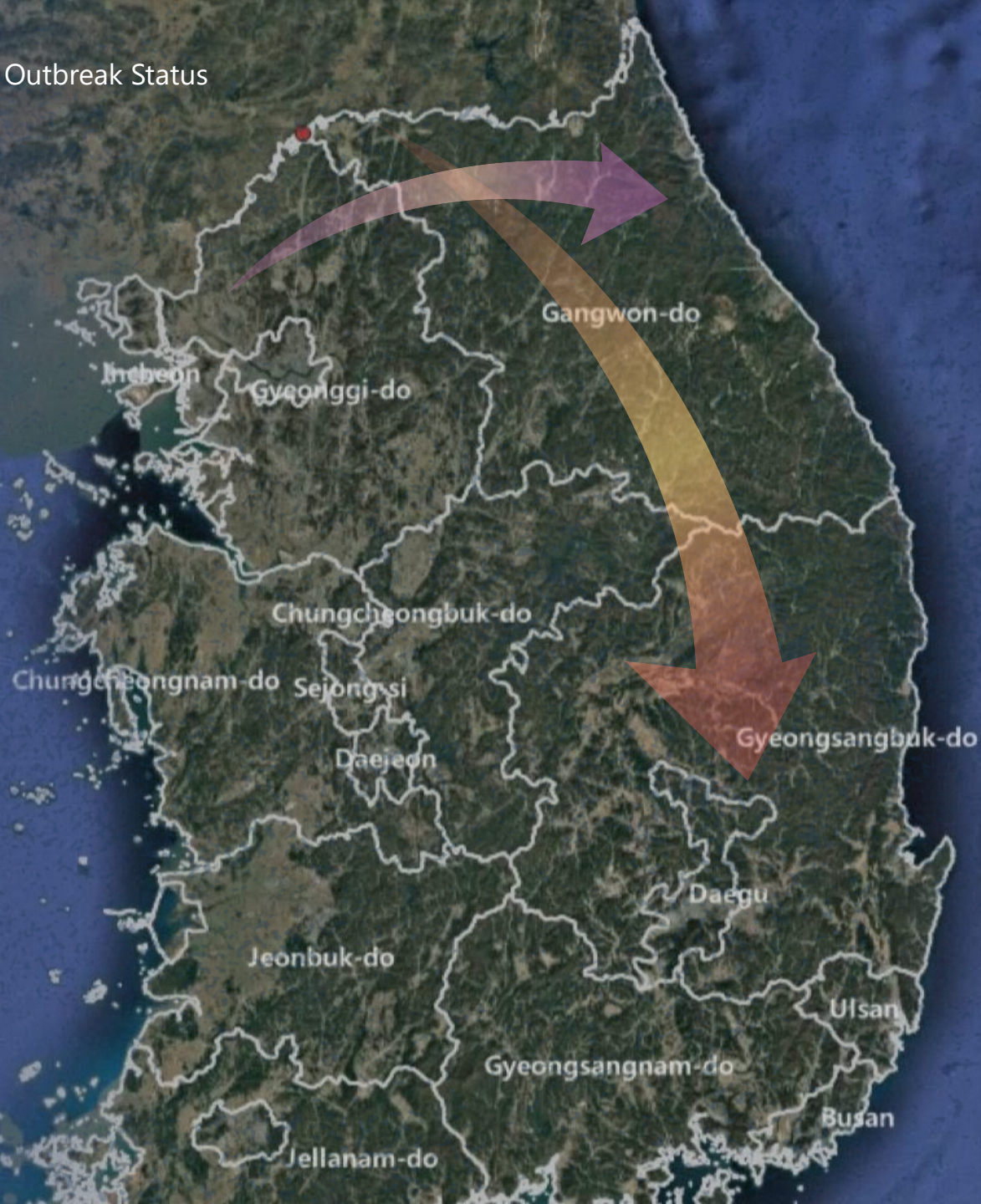
As of Jun 30, 2025,  
47 ASF cases reported.

This is about **7.6%** of  
the cases reported  
during the same period  
last year.

● ASF Outbreak Sites  
ASF Outbreak Sites (2025)







## Progression of ASF Virus Spread



03.

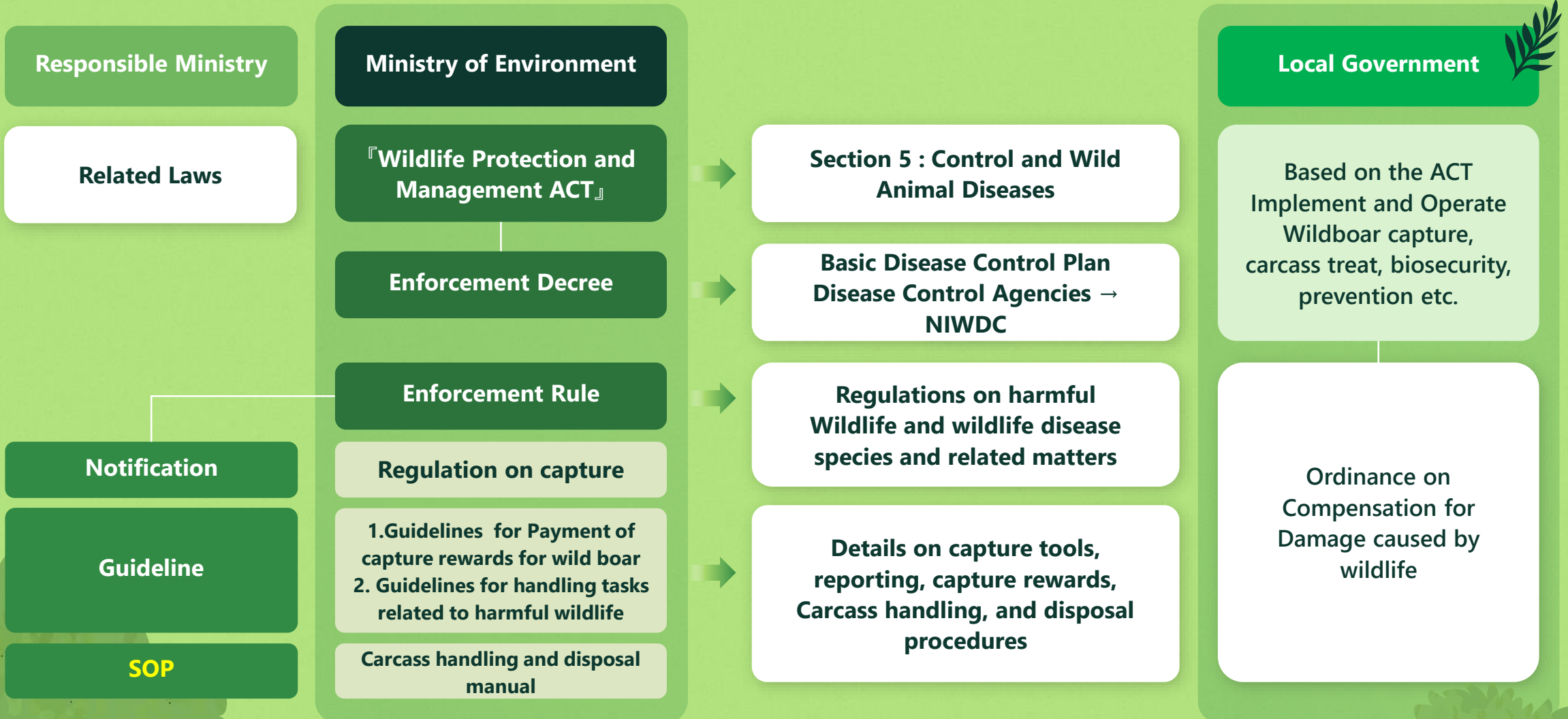
# Relevant Laws and Major Countermeasures

3-1. Legal Framework / Relevant Laws

3-2. ASF Overall Response System

3-3. Relevant Organizations and Their Roles

3-4. Changes in Countermeasures





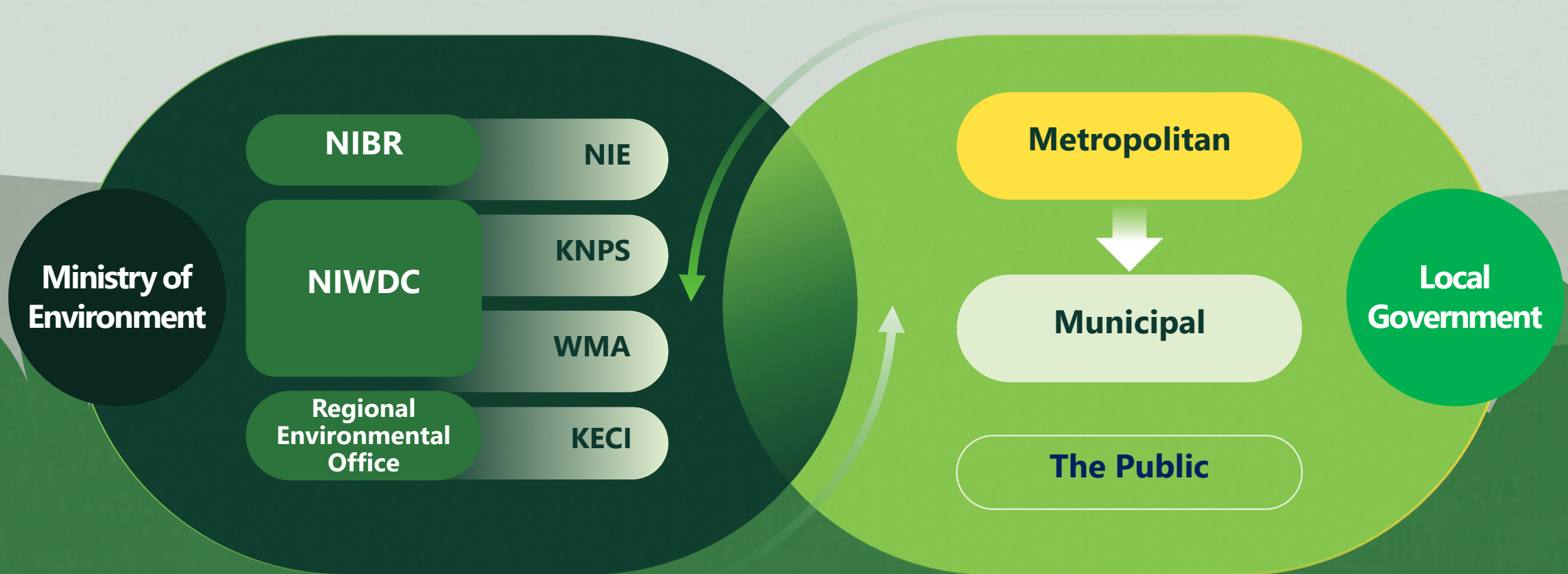
# 3-1. Legal Framework / Relevant Laws

## Relevant Organizations and Their Roles

Organization	Role	Description
<b>Ministry of Environment</b>	Policy Coordination for ASF Control	Formulation of comprehensive countermeasures for ASF, budget planning and allocation, media response
<b>NIWDC</b> (National Institute of Wildlife Disease Control and Prevention)	General Management of ASF Response	ASF diagnosis, Management of ASF response operations(capture and carcass search), Environmental surveillance, Field epidemiological investigations, Environmental surveillance, Job training for responsible public officials
<b>Regional Environmental Office</b>	Regional Management of ASF Response	Management of ASF search personnel by city and county, Payment of bounties for captured or discovered wild boars, Monitoring of fraudulent activities
<b>NIBR</b> (National Institute of Biological Resources)	Ecological Research	Survey on Wild Boar Habitat Density
<b>Wildlife Management Association</b>	Project Implementation/Institutional Support	Support for capture activities(thermal drones, trapping devices), Operation of carcass detection dogs, Training for hunters and monitoring of fraudulent activities
<b>KNPS</b> (Korea National Park Service)	Management of Conservation Areas	ASF Response and Research within National Park Areas
<b>KECI</b> (Korea Environment Conservation Institute)	Management of Fences	Installation and maintenance of regional fencing systems
<b>Metropolitan Government (Regional Local Gov.)</b>	Management of Local Governments	Consolidation of Local Government’s Performance Data
<b>Municipal Government (Basic Local Gov.)</b>	Frontline Agencies for ASF Response	Management of hunters(capture permit issuance), Collection of ASF samples and submission for testing, Storage and disposal of carcasses, Management of burial sites for ASF positive cases
<b>The public</b>	Report upon discovery of a wild boar carcass	“The most powerful surveillance system is a vigilant citizen”

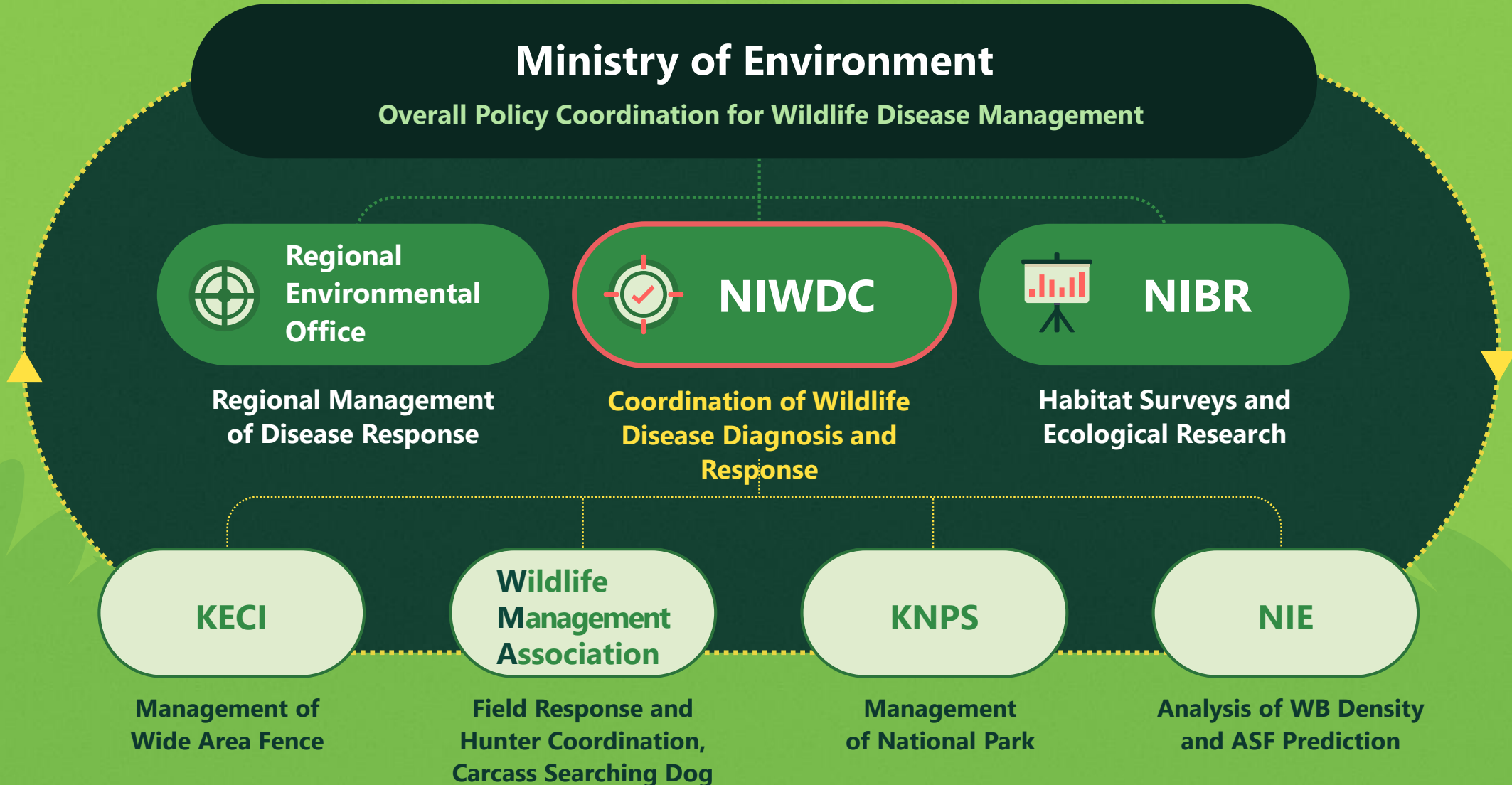
## 3-1. Legal Framework / Relevant Laws

### ASF Response System Diagram

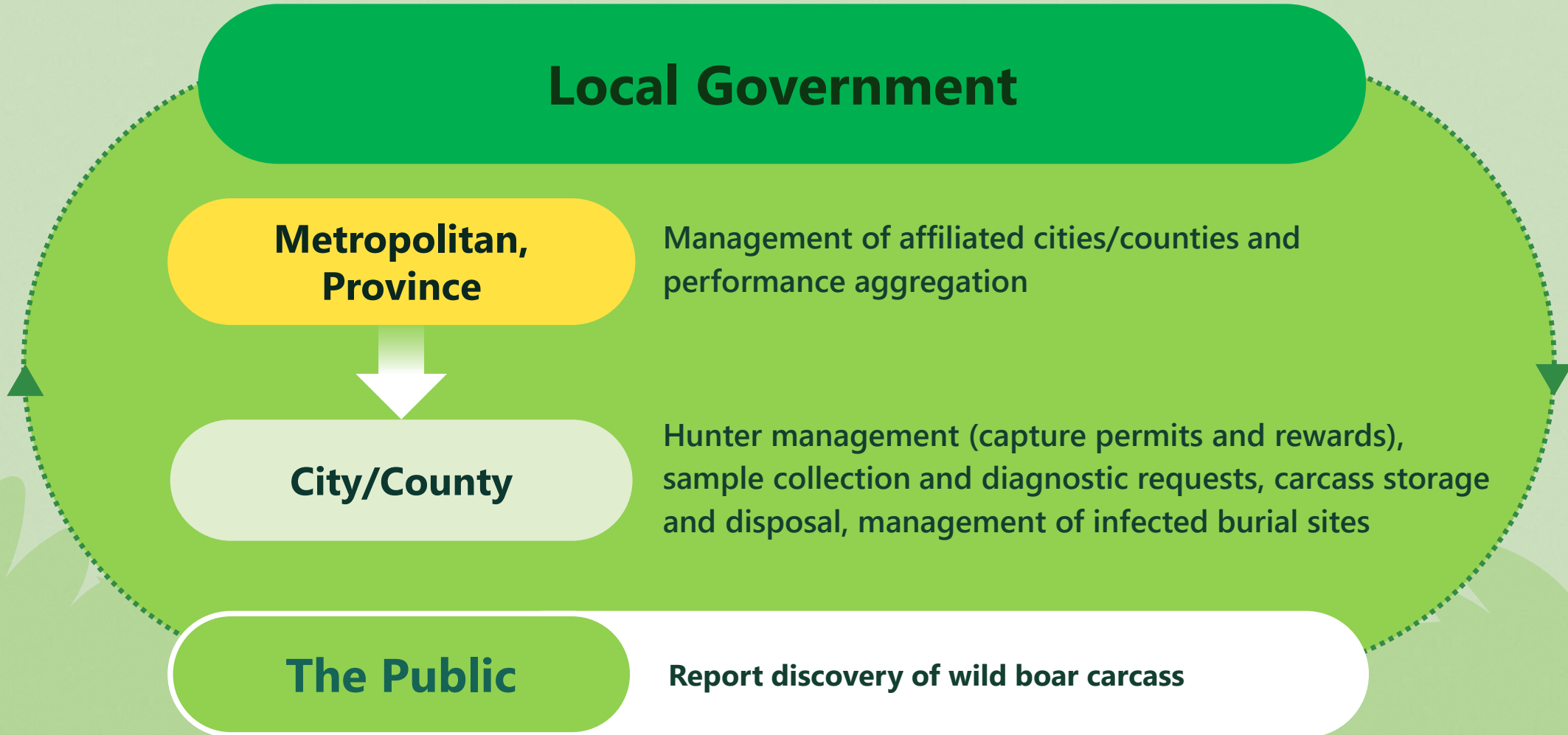




# Relevant Organizations and Their Roles

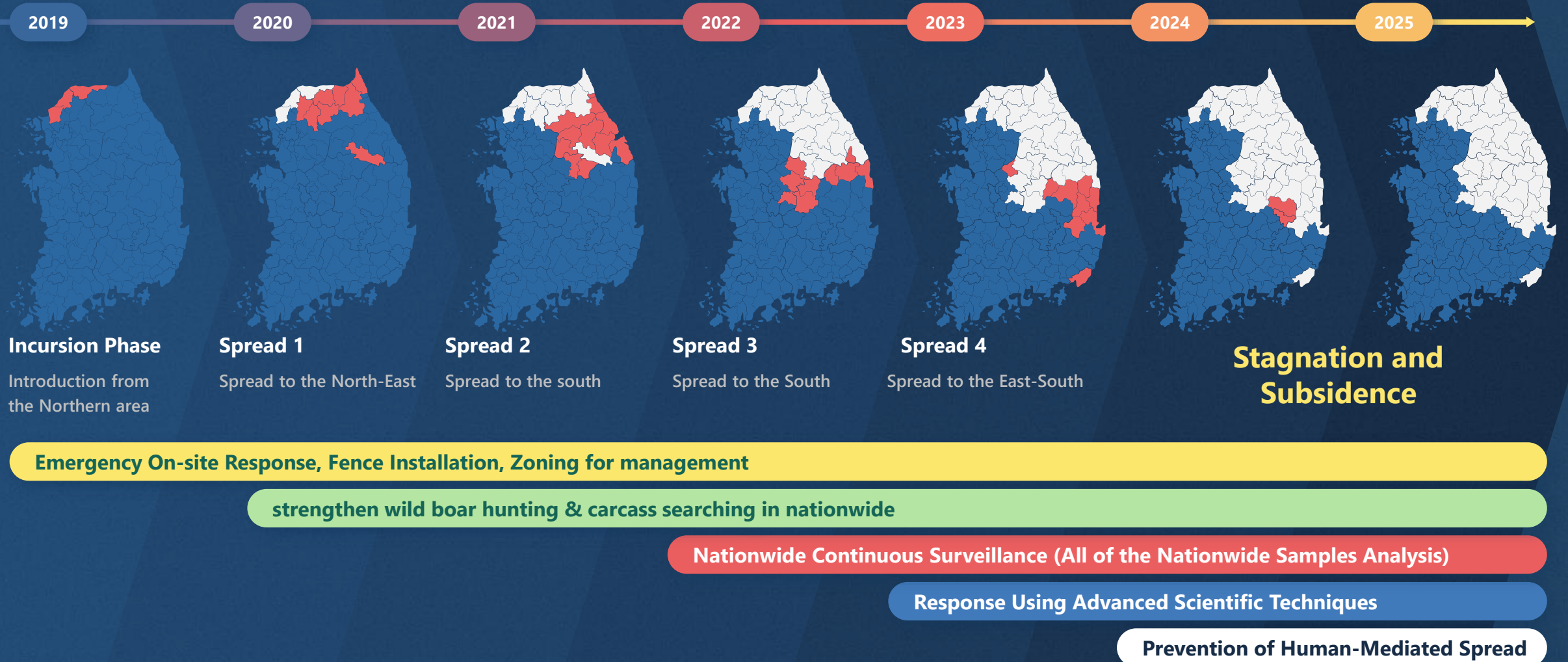


## Relevant Organizations and Their Roles



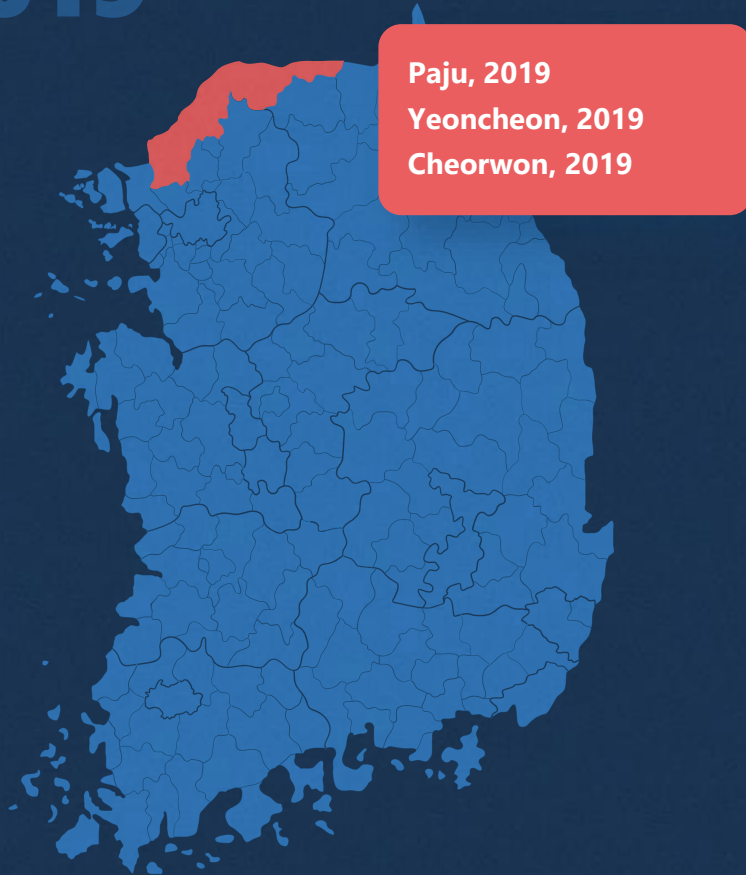


# ASF Overall Response System



# ASF Overall Response System

## 2019



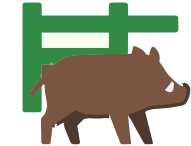
## Implementation Strategy



**Emergency  
On-Site Response**



**Designation of  
Control Areas**



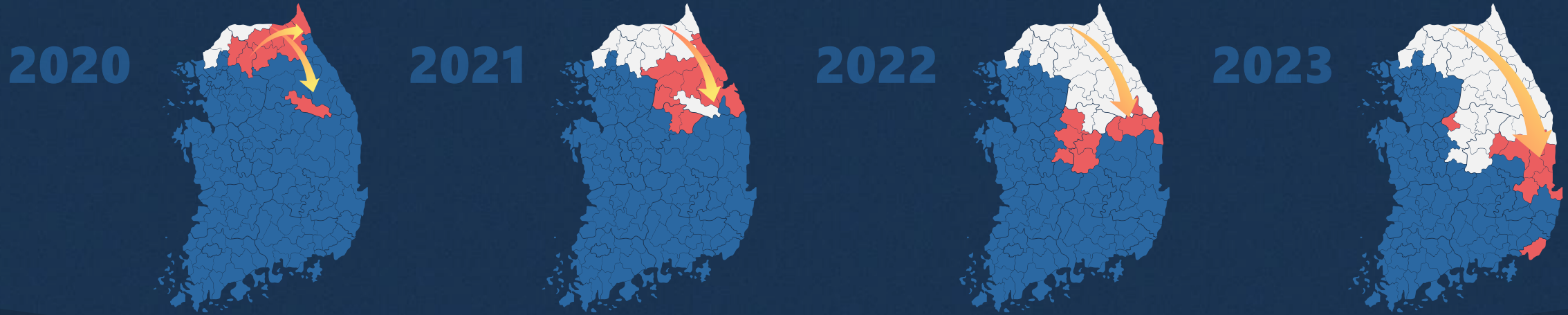
**Fence  
Installation**

## Key Points

1. Reactive response centered on outbreak areas
2. Establishment of infected, buffer, and surveillance zones
3. Installation of primary and secondary containment fences



# ASF Overall Response System



## Implementation Strategy



Emergency On-Site Response

> Nationwide Continuous Surveillance

Designation  
of Control Areas

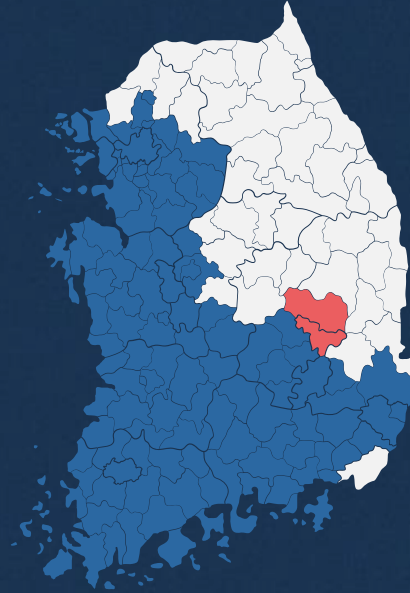
Fence  
Installation

## Key Points

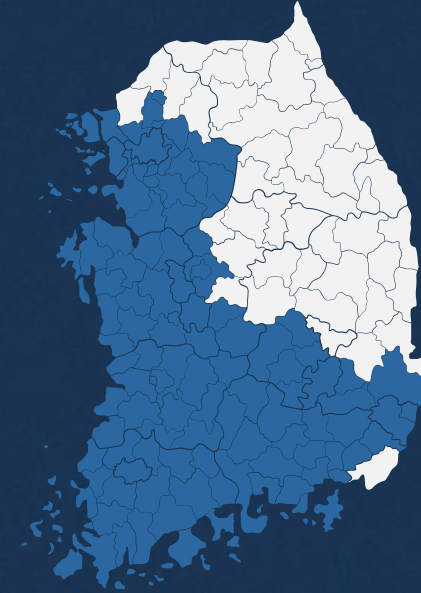
1. Expansion of Management to Non-Affected Areas
2. Installation of Large-Scale (Wide Area) Fencing
3. Establishment of Clean Zones (Buffer Zone)
4. Nationwide Testing of All Wild Boar Samples ('22~)
5. Focused Response in Affected and Risky Areas Using Scientific Methods

# ASF Overall Response System

2024



2025



## Implementation Strategy



**Emergency On-Site Response**

➤ **Nationwide Continuous Surveillance**

➤ **Prevention of Human-Mediated Spread**

**Designation  
of Control Areas**

**Fence  
Installation**

## Key Points

1. Expanding the scope of management to include human-related risk factors  
(e.g., inspections of biosecurity practices)
2. Strengthening biosecurity throughout the entire response process
3. Enhancing ASF response ability by local governments and related agencies