



Ministry of Environment
National Institute of
Wildlife Disease Control and Prevention

ASF management and Surveillance System for Wild Boars in Korea

- Part 3 -



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

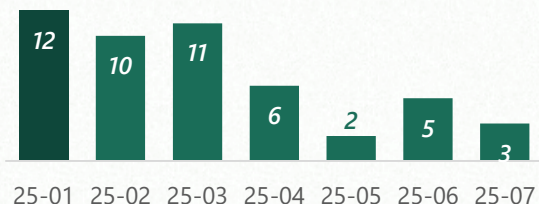
ASF Surveillance and diagnosis (diagnosis)

1 What is the Wildlife Disease Management System (WADIS)?

- An information management system for systematically handling wildlife-origin disease samples in response to nationally designated zoonotic disease outbreaks.
- Enables efficient administrative processing and rapid result notification through the WADIS platform.
- Applies statistical data processing to provide diverse and actionable insights.
- Used not only for ASF, but also for managing data on AI (Avian Influenza) and SFTS (Severe Fever with Thrombocytopenia Syndrome).

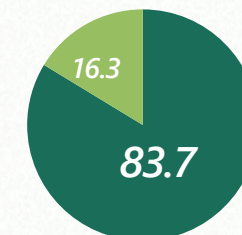
WADIS System Statistics Dashboard

ASF Positive Case Trend



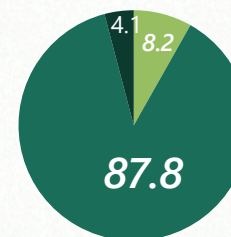
Type of ASF-Positive Individuals

- Carcasses (41 cases)
- Hunted (8 cases)

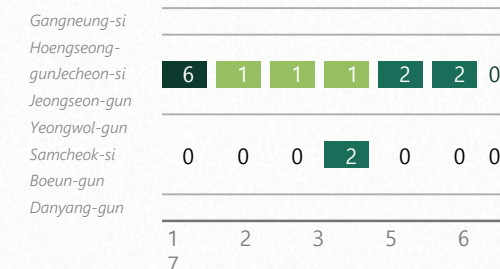


Testing Status by Sample Type

- Tissue (43 cases)
- Blood (4 cases)
- Others (2 cases)



Testing Status by Key Regions



2 ASFV Diagnostic System



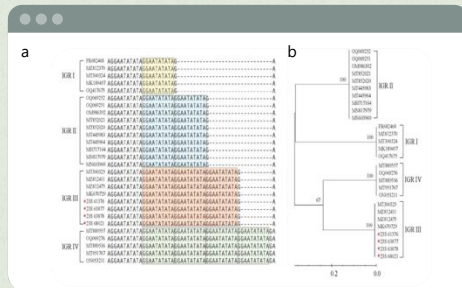
A Request Submission via WADIS



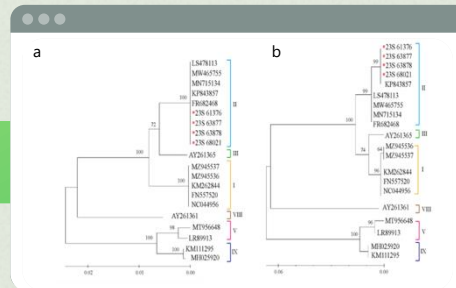
B Sample Transfer



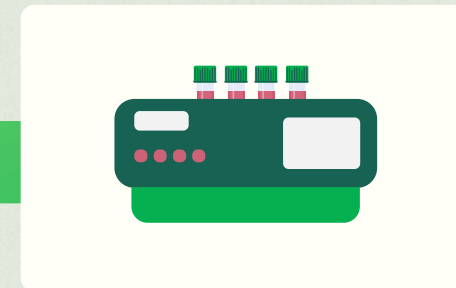
C DNA Extraction



F Additional Genetic Analysis for Mutation Surveillance



E Sequence (Genotype) Identification



D PPA, P72 convention PCR

2 ASFV Diagnostic System

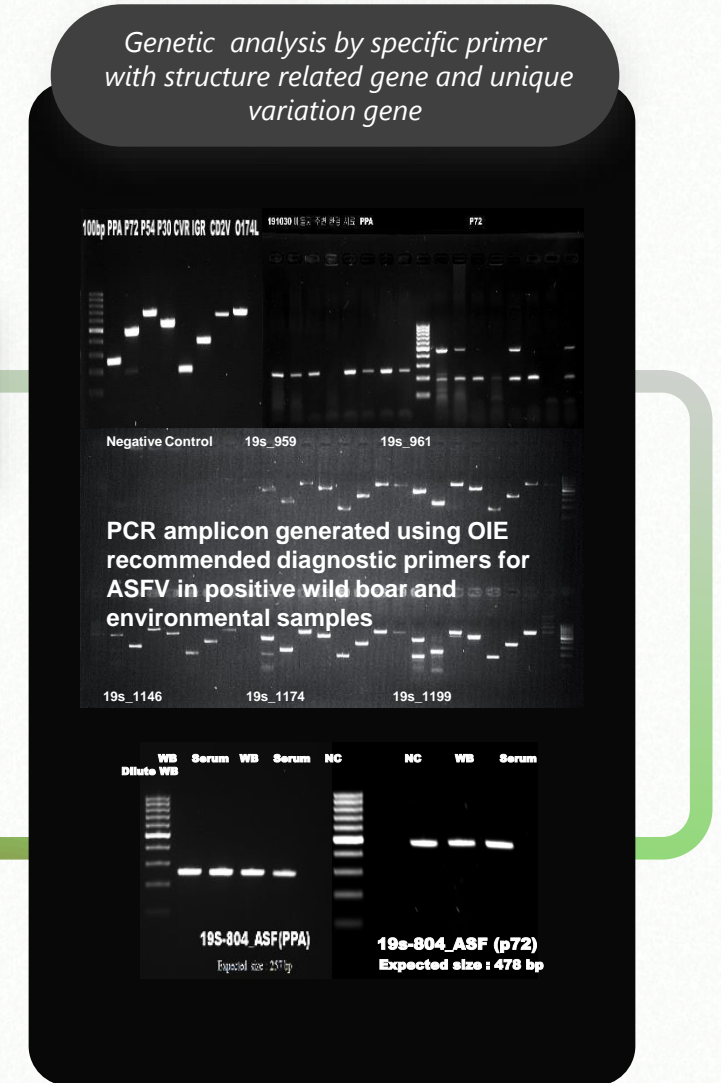
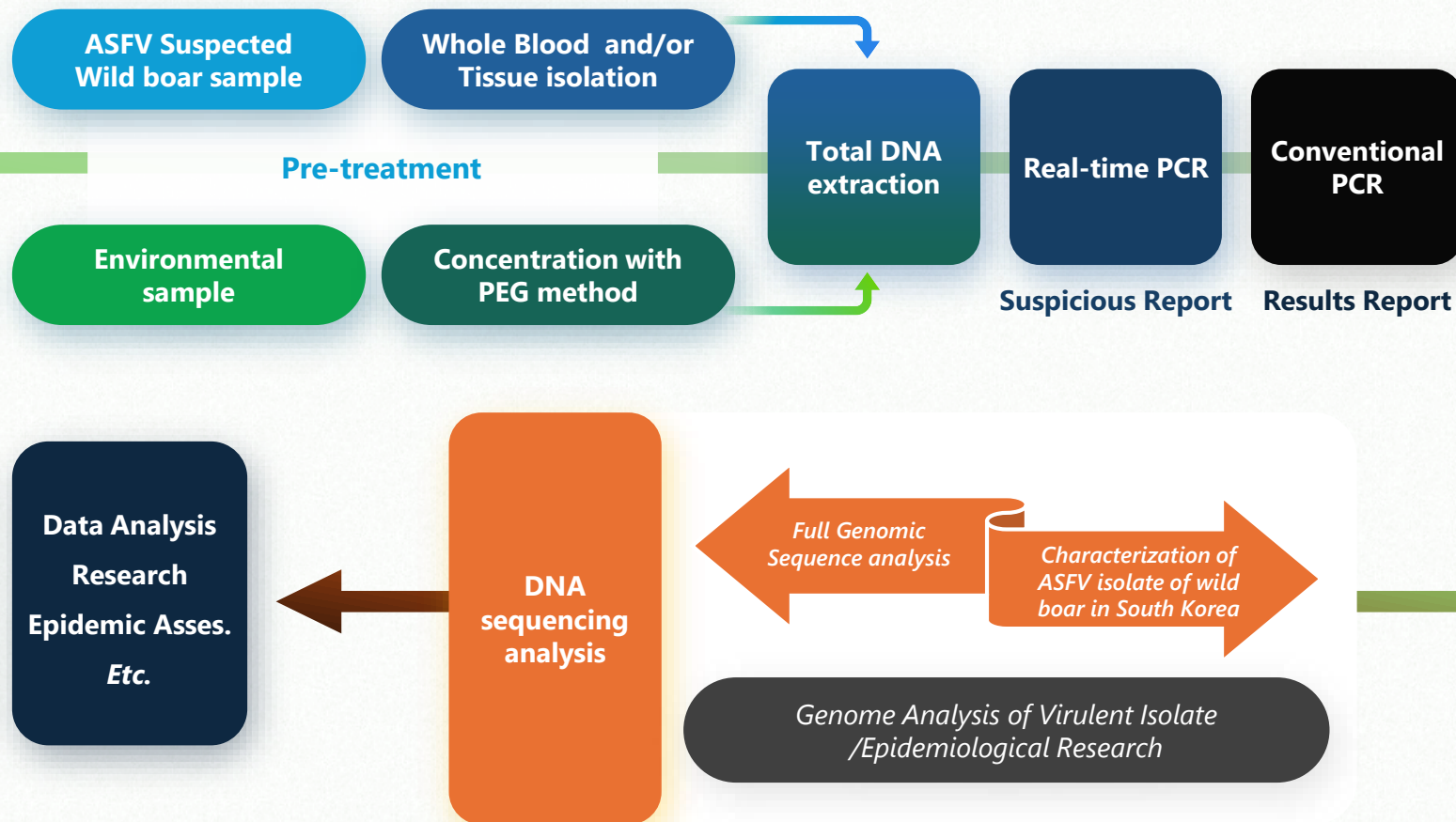
Rapid Response

Samples Transferred by
Helicopter in Cooperation
with the Ministry of National
Defense for a Rapid Diagnosis

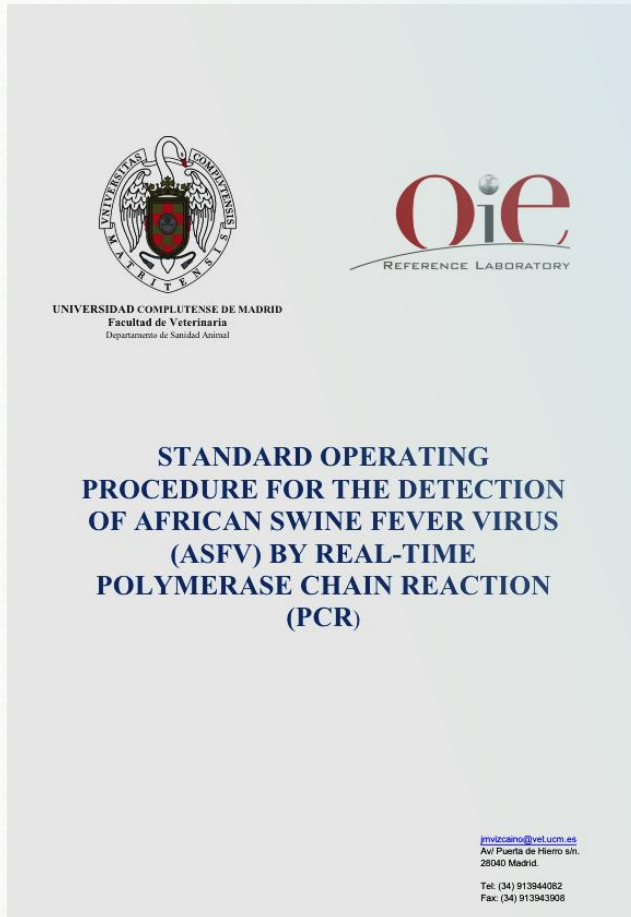


ASF Surveillance and diagnosis (Early detection of Wildboar ASFV Infection)

1 ASF virus Genetic Analysis

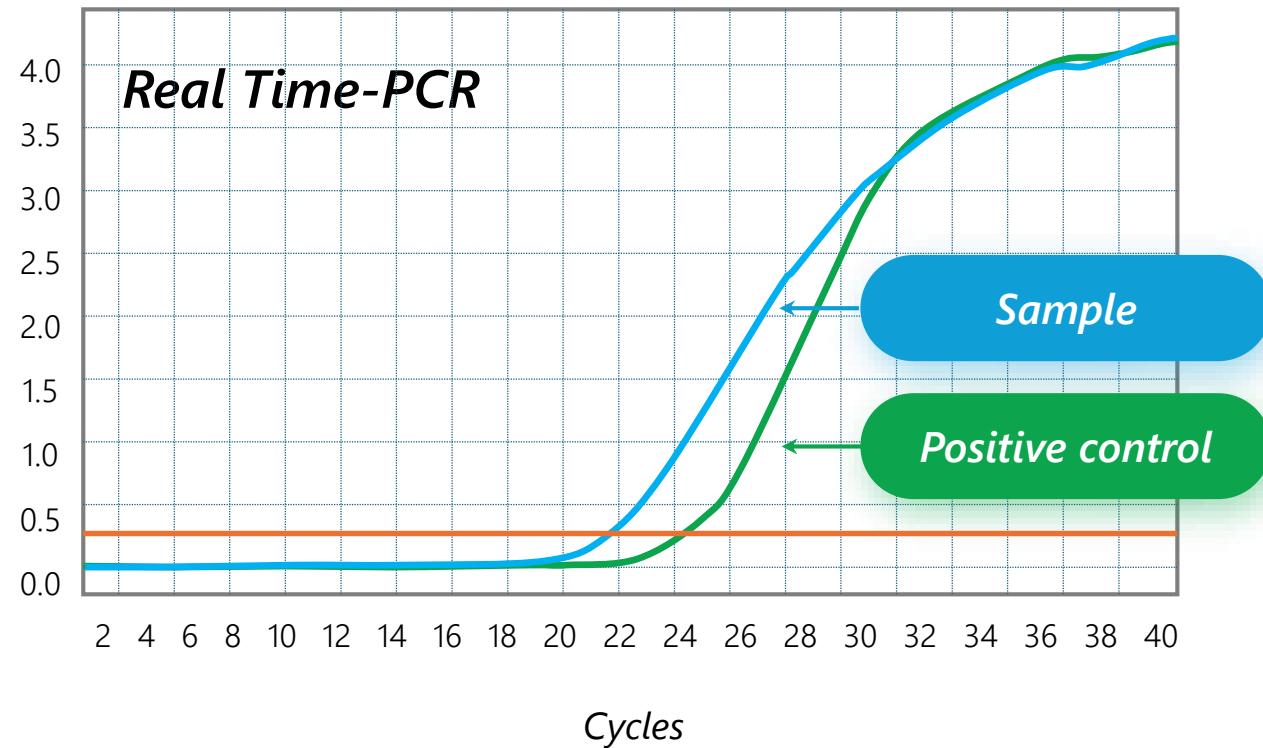


2 ASF virus Genetic Analysis



Amplification Plot

Applied biosystems



ASF Surveillance and diagnosis (Prevention of Human-Mediated Transmission)

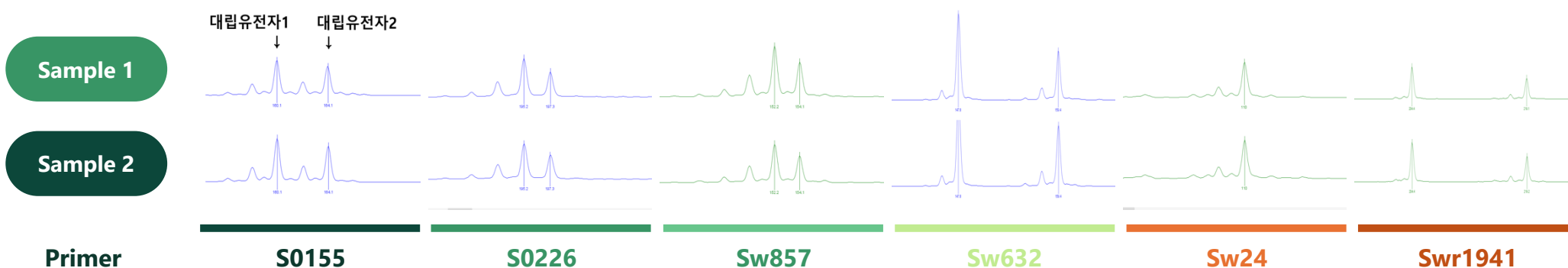
1 Kinship Analysis

Purpose : To identify individual wild boars using genetic profiling and detect fraudulent activities (e.g., duplicate reporting), thereby minimizing administrative inefficiency and budget waste.

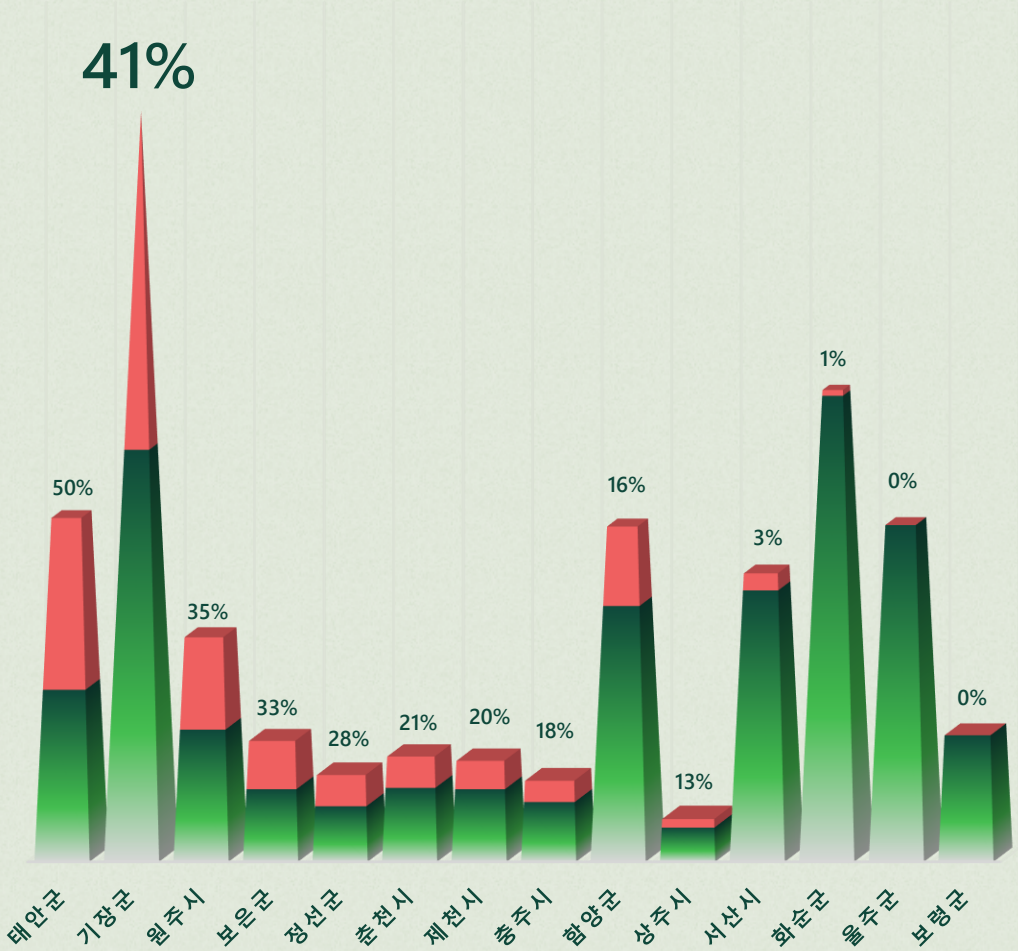
Method: Genotype information is obtained using 16 pairs of STR primers specific to wild boars.

- Detection of identical individuals through genetic comparison analysis.
- Results are shared with relevant authorities (local governments, regional environmental offices) for follow-up action.

※ Sixteen genetic markers developed for wild boars are applied using a forensic method similar to that used in human identification, with reliability exceeding 99.99%.



1 Kinship Analysis



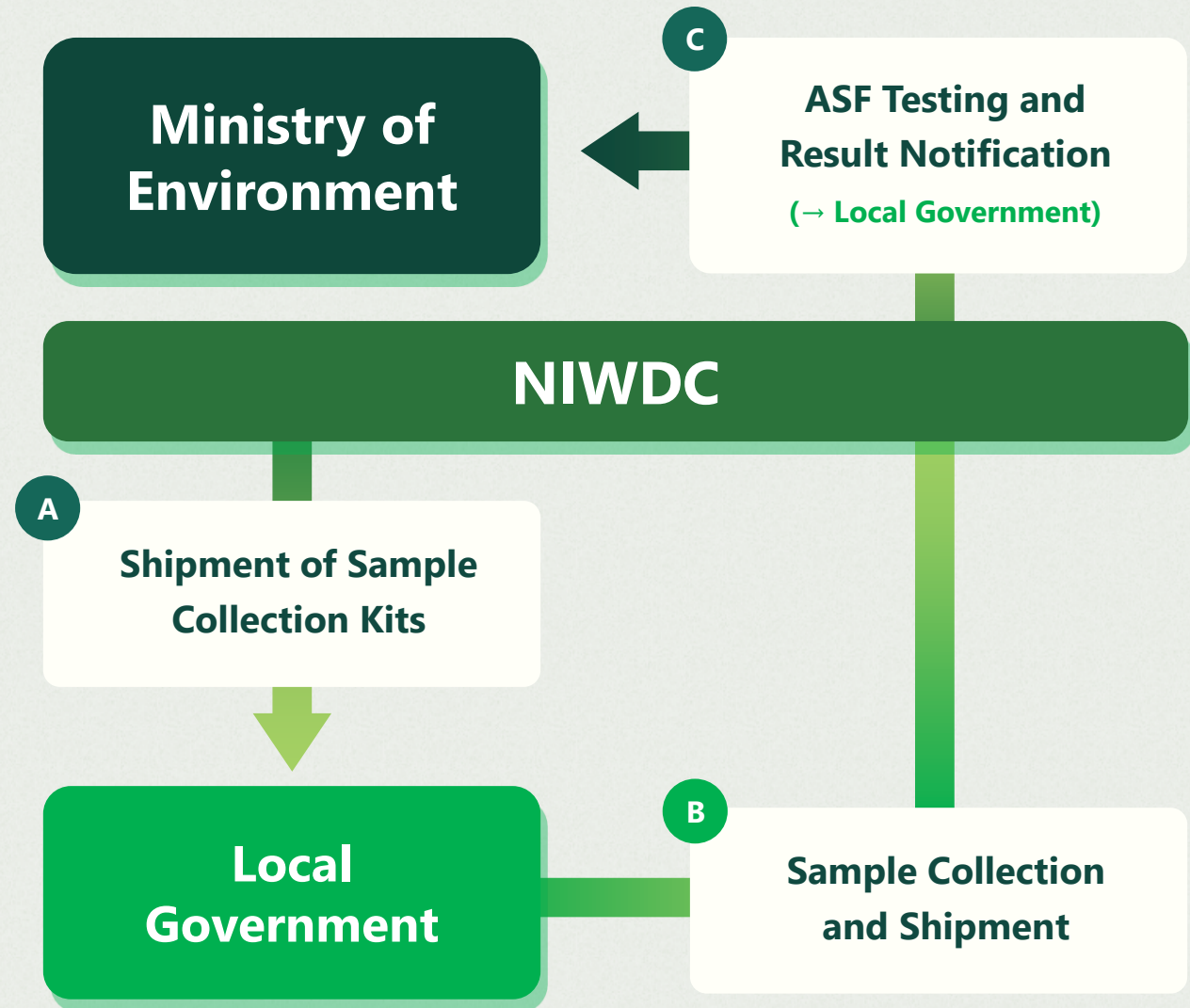
| Year | Province | city | Samples Analyzed (Cases) | Number of Detected Groups | Number of Detected Individuals (Boars) |
|----------|-----------|-----------|--------------------------|---------------------------|--|
| Total | | | 2,228 | 140 | 528 |
| 2020 | GangWon | Chuncheon | 74 | 9 | 22 |
| Subtotal | | | 74 | 9 | 22 |
| 2021 | Gangwon | Jeongseon | 61 | 5 | 22 |
| | Gyeonggi | Gwangju | 2 | - | - |
| Subtotal | | | 63 | 5 | 22 |
| 2022 | Chungbuk | Boeun | 85 | 14 | 34 |
| | | Chungju | 57 | 6 | 15 |
| | Gyeongbuk | Sangju | 30 | 3 | 6 |
| Subtotal | | | 172 | 23 | 55 |
| 2023 | Chungbuk | Boryeong | 89 | - | - |
| | Gangwon | Wonju | 158 | 23 | 65 |
| | Chungbuk | Jecheon | 71 | 8 | 20 |
| | Gyeongnam | Hamyang | 236 | 21 | 56 |
| | Busan | Gijang | 65 | 9* | 34* |
| Subtotal | | | 619 | 52 | 141 |
| 2024 | Busan | Gijang | 528 | 35 | 238 |
| | Ulsan | Ulju | 237 | - | - |
| | Jeonnam | Hwasun | 332 | 2 | 4 |
| | Chungnam | Seosan | 203 | 5 | 12 |
| | | Taeon | 242 | 43 | 121 |

2 Biosecurity Inspection

Background

A comprehensive inspection was conducted in ASF-affected areas to assess potential human-mediated transmission risks
(e.g., hunters, hunting dog, equipments).

The goal was to evaluate the current state of biosecurity management and **raise awareness** of the importance of on-site disease control.



ASF Surveillance and diagnosis (Data Analysis and Research & Development)

ASF Spread Prediction Study in Wild Boars

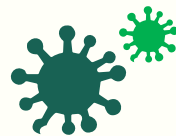
1 Purpose

To develop an applicable ASF spread prediction model by integrating ecological characteristics of wild boars, topography, land cover, and fencing status into the modeling framework.

2 Main Components



Compilation of domestic wild boar ecological, environmental, and management activity data



Analysis of ASF outbreak status in South Korea



Advancement of ASF risk prediction models for domestic spread

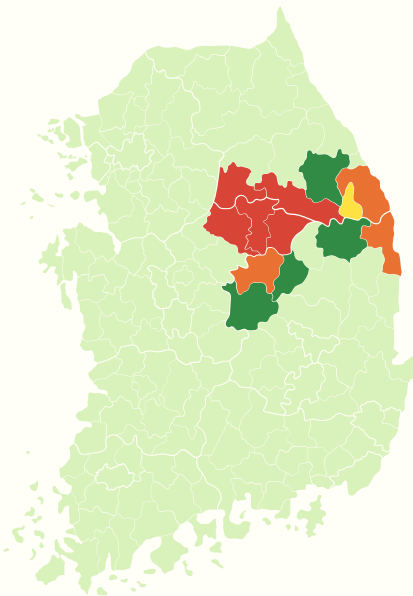


Visualization of ASF outbreaks and predicted risk areas, with improved data accessibility

ASF Predicted Spread by Municipality

Area (ha)

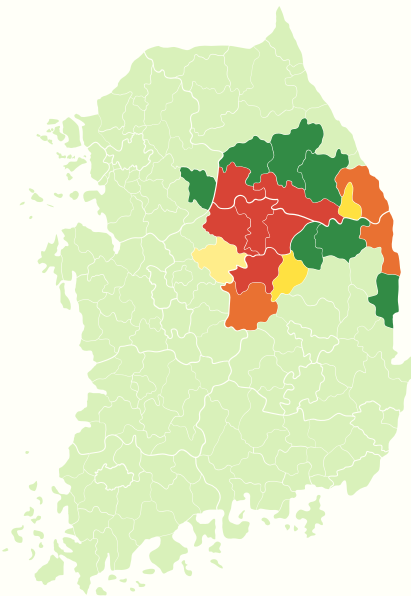
- 0-5000
- 5001-10000
- 10001-15000
- 15001-20000
- 20001-39410



Prediction
30-Day
(2023.4.1.)

Area (ha)

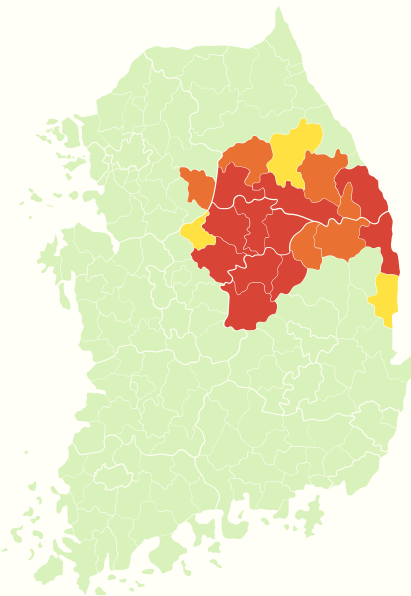
- 0-10000
- 10001-20000
- 20001-30000
- 30001-40000
- 40001-1000000



Prediction
60-Day
(2023.4.1.)

Area (ha)

- 0-10000
- 10001-20000
- 20001-30000
- 30001-40000
- 40001-1000000



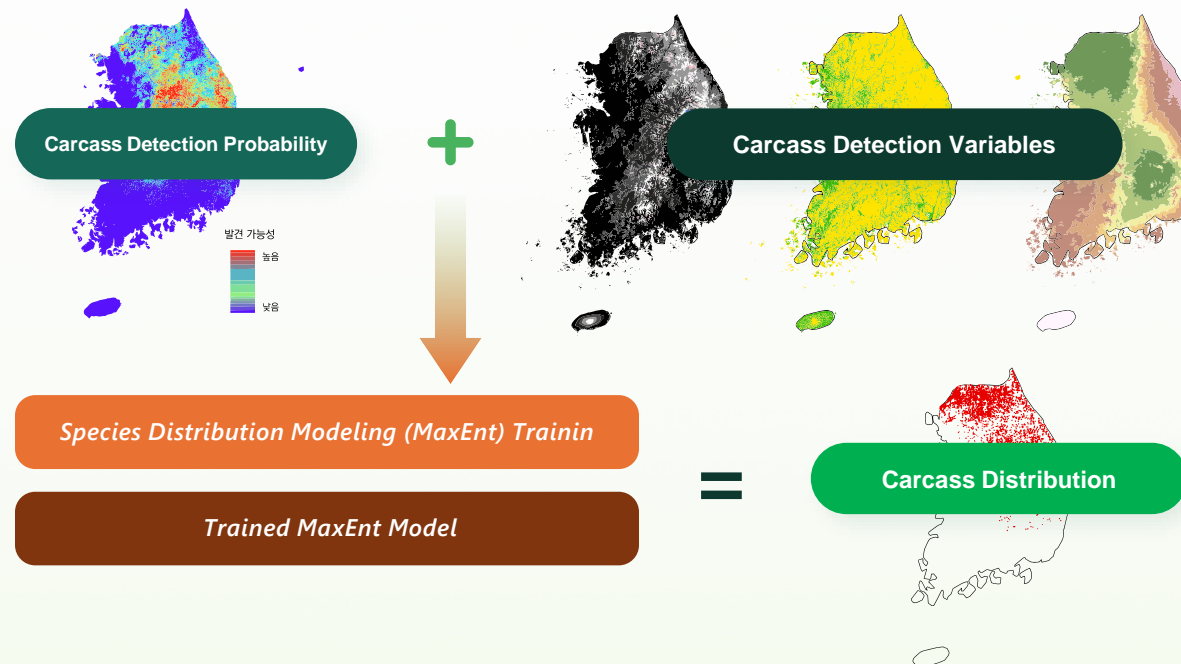
Prediction
90-Day
(2023.4.1.)

3 Purpose

To enhance the efficiency of carcass search operations by developing a wild boar carcass prediction map using carcass data held by NIWDC and various environmental variables (*e.g., temperature, precipitation, slope*).

4 Key Components

Method for Developing a Carcass Prediction Model



- **Advanced Modeling for Wild Boar Carcass Prediction**
- **ASF Response Simulation Development**
- **Upgrading the ASF Situation Room and Developing Response Programs**
- **Enhancement of ASF Integrated Document and Data Management**

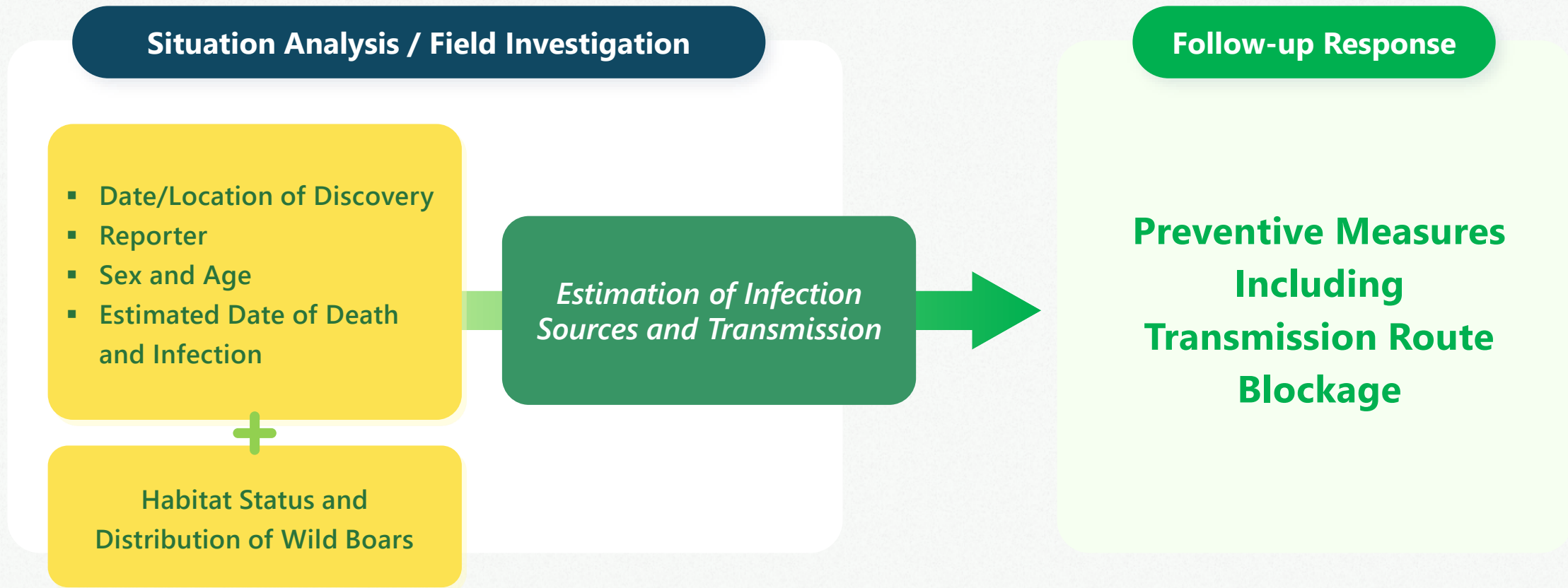
Environmental and Epidemiological Investigation (Burial Site Management)

1 Burial Site Condition Inspection (by Local Governments and NIWDC)

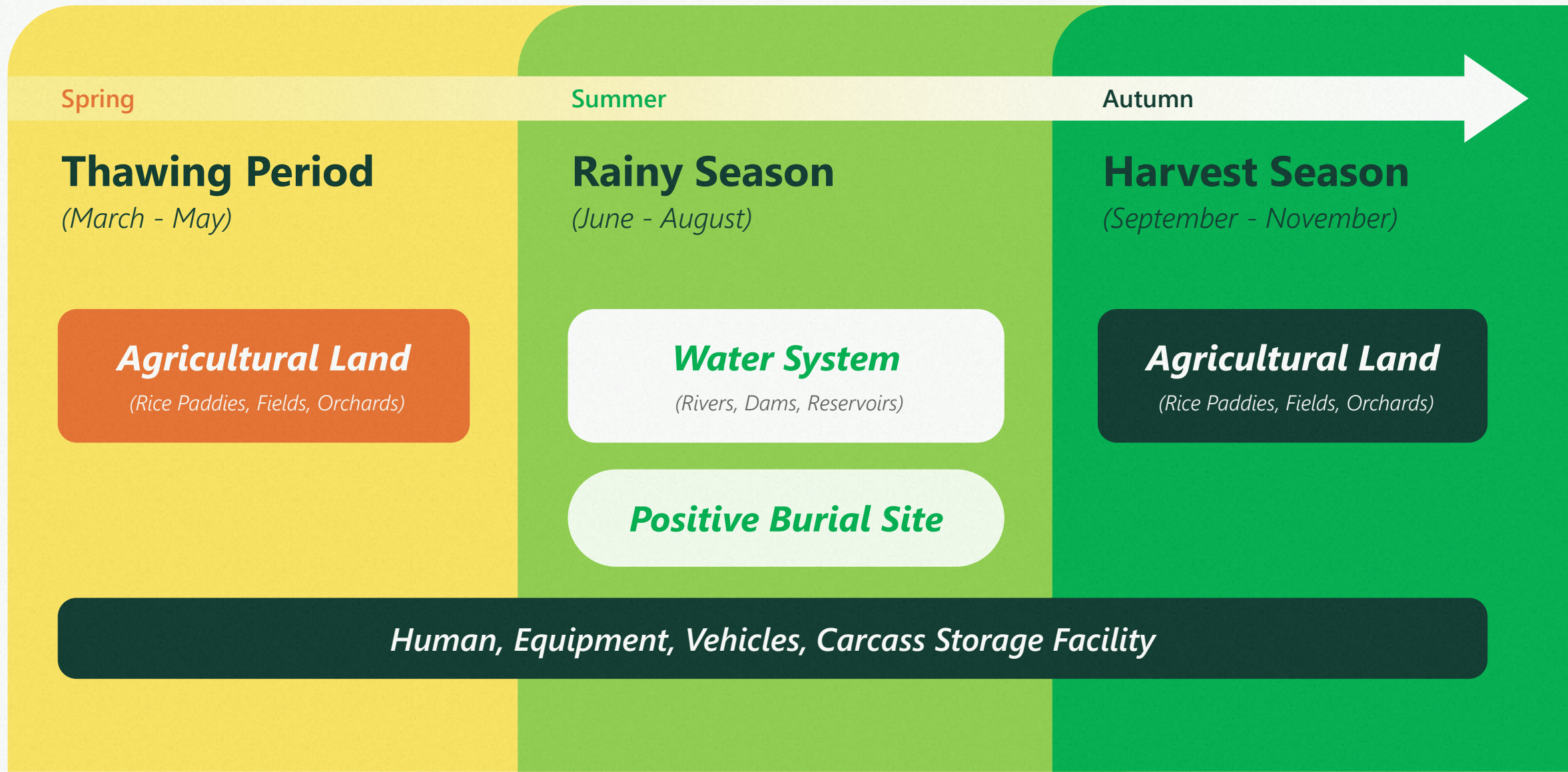
| Spring | Summer | Autumn | Winter |
|---|---|--|--------|
| Local Governments | | | |
| NIWDC | | | |
| <ul style="list-style-type: none">Updating Newly Created Burial SitesInspection and Verification of Burial Site Damage | <p>On-Site Inspection of Established Burial Sites</p> <ul style="list-style-type: none">NIWDC : Key sites, including outermost outbreak zones and areas near farmsLocal Governments : All other burial sites | <p>Decommissioning of Burial Sites (after 3 years)</p> | |

Environmental and Epidemiological Investigation (Epidemiological Investigation)

1 Environmental Epidemiological Investigation Mechanism



Environmental and Epidemiological Investigation (Environmental Pollution)



야생멧돼지 ASF 양성 개체 부정 이동신고 동향보고

| 보고일시 | 보고구분 | 자료구분 | 홍보계획 | 공유계획 | 담당과장 |
|----------|-------|-------|------|-------|-----------------------------------|
| '23.7.11 | 대면 서면 | 현안 결재 | 유 무 | 국회 대실 | 국립야생동물질병관리원 정원화(010-5919-6559) |

- ▶ 비발생지역인 경북 구미시에서 신고된 멧돼지 ASF 시료 양성 의심(7.3)
→ 기존발생지역으로부터 장거리 이격(약 28km), 수렵인 진술 번복 등 부정신고 의심
- ▶ 신고지점 주변 확인과 수렵인 면담을 통해 지인이 경북 안동에서 포획한 개체를 수렵인이 구미에서 포획한 것으로 허위 신고했다는 진술 확보(7.4, 질병관리원)
- ▶ 수렵인의 진술 신뢰성이 낮아 실제 포획지점은 다를 수 있어 추가조사 진행 중(7.10~)

□ 확인 결과

○ 경북 구미시(비발생지역)에서 포획 신고된 야생멧돼지 1개체 양성 의심(7.3)

- 최초 신고지점 : 경북 구미시 옥성면 대원리 36-1(수렵인: 이○습)

- 신고지점이 비발생지역이고, 기존 발생지역과 멀리 떨어져 부정행위 의심

- 신고지점이 비발생지역이고, 기존 발생지역과 멀리 떨어져 부정행위 의심

* 가장 가까운 발생지점은 약 28km 떨어져 있는 경북 상주시 화동면 판곡리

- 활동 동선, 사체 상태, 신고지점 흔적 등이 수렵인의 신고내용과 상이

* 경북 안동시 도산면 원천리 산79에서 포획한 것으로 주장(지인: 김○중)

○ 지인이 포획한 것으로 주장하는 안동시도 비발생지역이며, 수렵인이 진술을 번복하는 등 신뢰성이 낮아 실제로 포획한 지점을 추가조사 중(7.10~)

□ 긴급대응 현황

○ (역학조사) 최초 신고지점 확인, 수렵인 면담 등 구미시 현장조사(7.4)

- 포획도구·사체보관창고 등 환경시료 채취(33건) → 전부 음성(7.5)

○ (열화상 드론) 각 진술 지점(구미·안동) 주변 멧돼지 서식현황 조사(7.3~7.4)

○ (상황 전달) 지자체에 부정행위 관련 현장 조사 결과 공유(→구미·안동)

Detailed Information

#Location of Discovery

#Reporter

#Test Date

#Closest Known Outbreak Site

Estimated Cause of Infection and Transmission Route

1. First suspected ASF case reported in a previously unaffected area
2. Long-distance separation from the nearest known outbreak site
3. Discrepancy between reporter's statement and initial report content

Follow-up Response to Prevent Further Spread

1. Additional habitat investigation, capture, and field search operations
2. Environmental survey and biosecurity inspection at the site
3. Information sharing on ASF occurrence with relevant authorities



Verification of Hunter's Statement

?

"I found a group consisting of a sow and piglets. I chased them, and managed to capture one piglet by stepping on"

A

However, it is common practice to target the sow using a firearm

B

The GPS log shows an unusually short duration of stay at the reported capture site

Field Investigation Findings

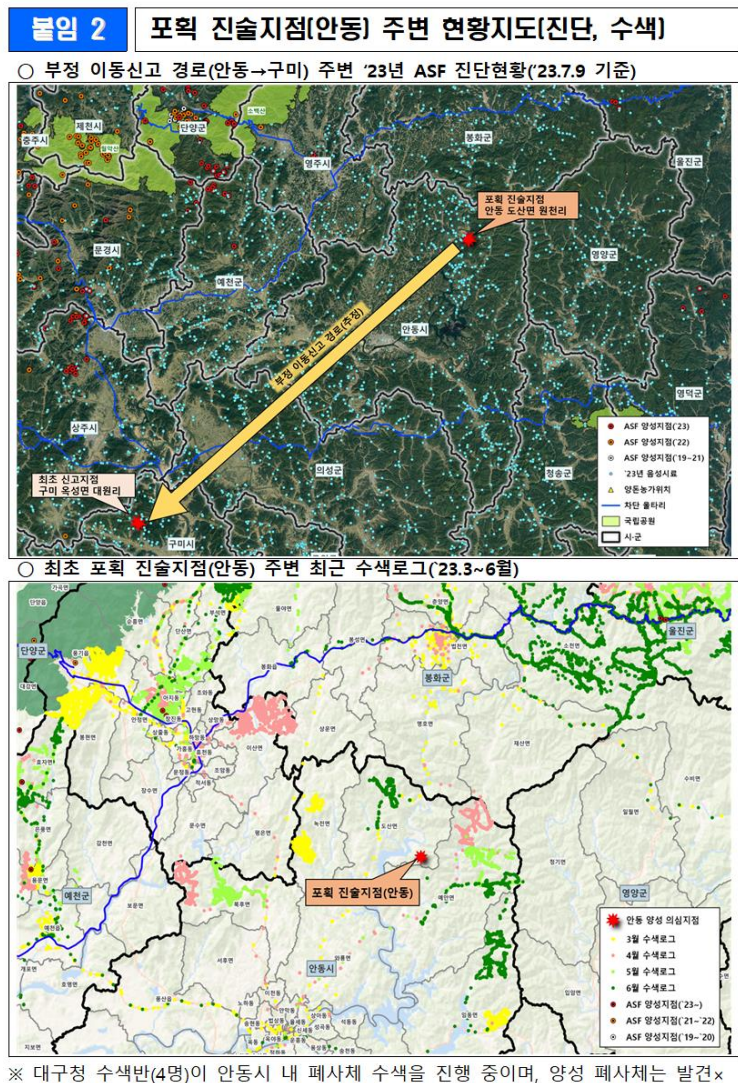
A search was conducted around the reported location for wild boar traces, but no signs of wild boars were found — only traces of water deer

A

No wild boar carcass was found during subsequent search operations.

B

Photo shows no sign of rain, despite reported weather.



Infection Route Estimation through Epidemiological Investigation

A

The hunter admitted to *falsely reporting the movement* of a wild boar from another city/county (Andong) to a non-affected area (Gumi).

B

At the time, Andong was also classified as a ASF free area.

1month later

**ASF Outbreak in
Andong City**

Education and Public Awareness (Education)

1 Firearm Safety Training



Target Audience

Hunters

- Behavioral Guidelines and Best Practices for Hunters
- Common Causes and Case Studies of Firearm Accidents
- Safe Disinfection and Biosecurity Procedures

Raising awareness of firearm risks and the importance of disinfection and disease control

2 Capacity-Building Training for Local Government ASF Officers



Target Audience

Local Government ASF Officers

- Basic Understanding of the ASF Virus
- Understanding Wild Boar Ecology and Capture Process
- Sample Collection and Submission Procedures
- Disinfection and Biosecurity Measures

To enhance field response capabilities and improve job understanding for new personnel.

Education and Public Awareness (Public Awareness)



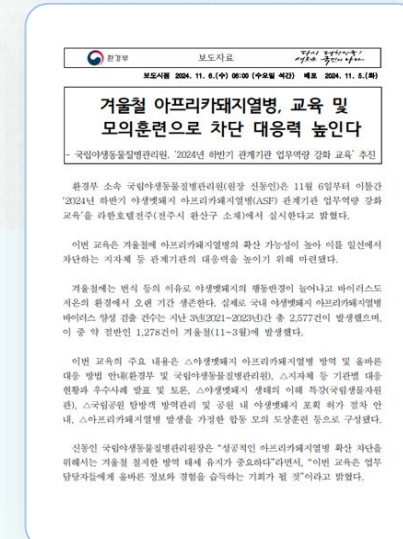
Promotional Materials for Hunters

Disinfection and Biosecurity Guidelines for Hunters



Public Information Materials

Public Guidelines for Reporting Wild Boar Carcasses



Media Release

ASF Response Press Materials on Wild Boars

To deliver information quickly, promote prevention, and raise ASF risk awareness to guide public behavior

05.

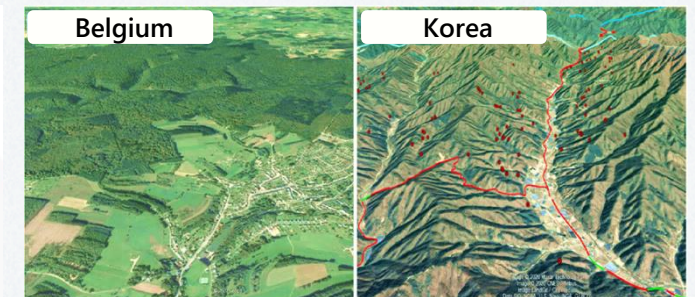
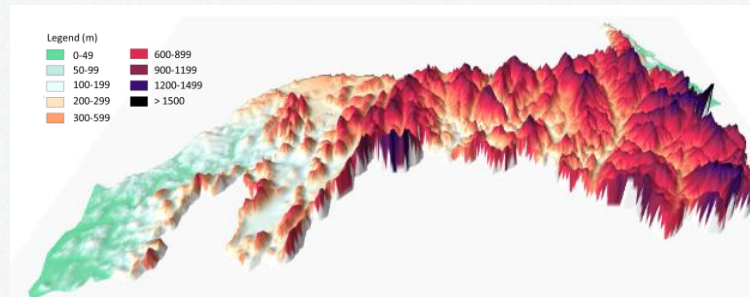
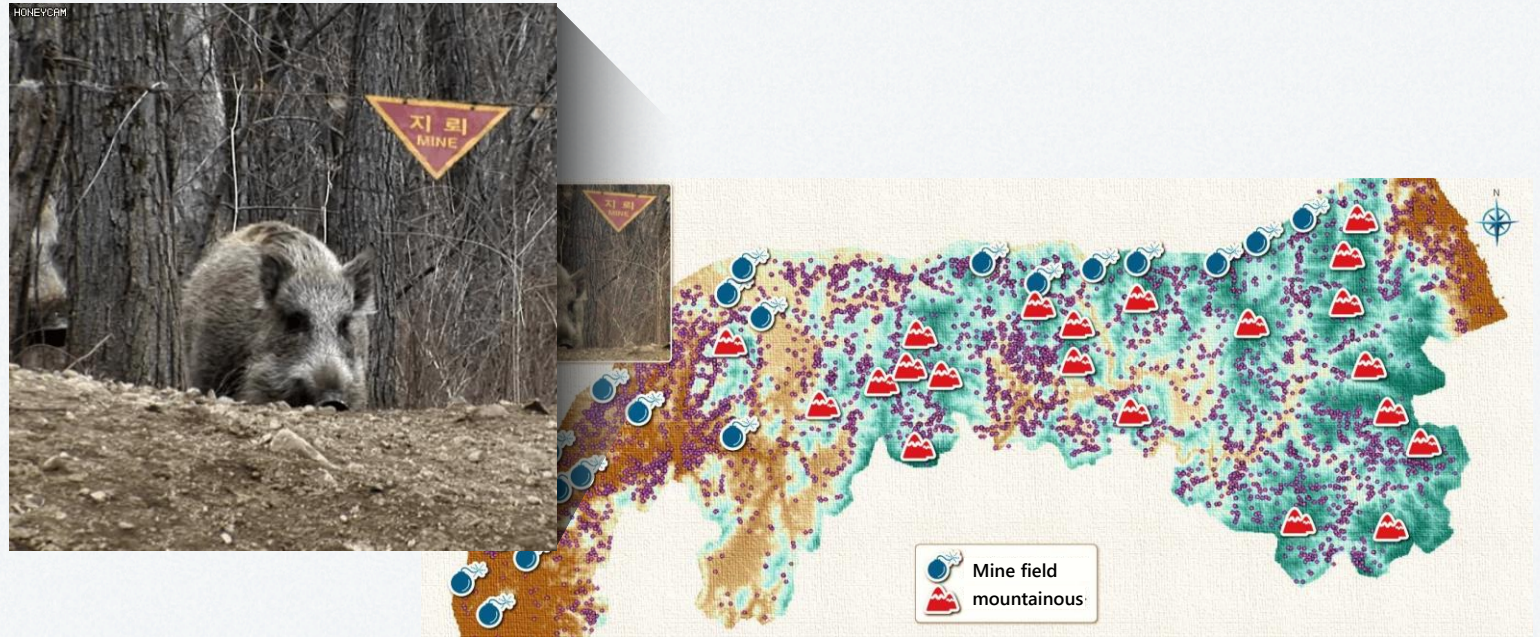
key Insights

Key Insights

1 Need for Country-Specific Strategies

Each country differs not only in its geography and ecosystems, but also in its policies


Rather than a uniform approach, response systems should be adapted to regional characteristics for greater effectiveness.



Key Insights

1 Key Strategies

Active Wild Boar Culling and Rapid Carcass Removal

- 
1. Regulating wild boar population is a critical component in preventing the spread of ASF.
 2. Early detection and swift carcass removal are essential for eliminating sources of contamination.
- *Active culling should be promoted through various measures such as bounty incentives, hunter training, and initiatives to boost hunter morale and pride.*
 - *In Korea, carcasses are promptly retrieved through field search teams and detection dogs.*

Establishing a Collaborative System Between Central and Local Governments

Active involvement of local governments is crucial, as they are responsible for managing hunters, sample collection and submission, and performance tracking.

The Need for Institutions (NIWDC)

Non-ASF countries should consider establishing a central institution like Korea's NIWDC to prepare for ASF response.

06.

Conclusion

Important points on ASF Response

Early detection and prevention of artificial transmission



1 Prevention of Artificial Spread and Strengthen the Role of Local Government, Network

ASF Spreads Rapidly Due to Illegal and Fraudulent Activities, Causing Great **Confusion in Response Measures**

- Unnecessary waste of administrative power and loss of national finances

Type of Cheating: Mostly aimed at **Capture Rewards (about 200,000 ~ 400,000 KRW/case)**

- Repeat or multiple reports of the same captured wild boar
- Moving wild boar from 'Non-Hunting Area' to 'Hunting Areas' and then report

Measures and Responses for **Illegal and Fraudulent Activities**

- Reinforcement of reward payment requirements
- Evidence of proof : ID tag (serial No.), actual on-site photo, GPS info, hunter name, hunting time, etc.
- Strengthening penalties for misconduct : Retrieve the reward (3~5 Times), exclusion of hunting activities
- Monitoring of identical entities through wild boar genetic blood relationship(sibling) analysis

Strengthen Local Governmental Responsibility

- Wild Boars hunting & hunters control, Biosecurity for carcass & burial management, ASF sampling & request



Thank you

