Wildlife Health Surveillance and the Spatial Monitoring and Reporting Tool (SMART)

Virtual Training Workshop on PPR Outbreak Investigation in Wildlife

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WHAT IS SMART?
• Suite of open-source technological tools

• Focused on effective management of protected areas

• Desktop, mobile, and online software
• Sustainable
• Flexible
• Easy to use
• Capacity building and technical support

SMART Desktop
SMART Connect
SMART Mobile
• Collect, standardize, store, communicate, and analyze ranger-generated data

• Georeferenced field observations, photos

• Maps and reports

• Assess where efforts should focus: strategic planning

• Measure performance

• Real-time data transfer: real-time response

• Share data across agencies and partners
• Group Ranch – Amboseli-Tsavo Kenya

• Distance walked per patrol from 9.6 km (January 2013) to 37.7 km (December 2013)

• Detection tripled and arrests doubled

• Patrolling from <20 patrols/100 days (2013) to 80 patrols/100 day (2015)
“A system for continuously creating and analyzing information on the health of wild species and associated risk factors, in order to meet the objectives of disease prevention, early pathogen detection, controlling or potentially eradicating disease in a population”
SMART MOBILE

- SMART MOBILE allows quick and accurate digital collection of field data
- Standardized data capture workflows and flexibility
- Eliminates the need for manual data entry or processing, or additional devices
- Georeferenced field observations with photos and others
- Ranger involvement
- Wildlife health teams involvement
SMART MOBILE FOR WILDLIFE HEALTH

- Environment
- Observations per species
- Individuals of the specific species

- Pathology
  - Samples from individual animals
  - Samples from the environment

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SMART MOBILE FOR WILDLIFE HEALTH

- Free-ranging Wildlife Morbidity Mortality
  - Type of Landscape
  - First Detection Sick/Dead Animal in Area
  - Distance to Livestock (km)
  - Report Disease in Livestock
  - Report Disease in Humans
  - Food and Water Availability
  - Other Signs in Environment
  - Project Tag
  - Number Healthy
  - Number Sick
  - Number Dead

- Project Tag
- Species
- Species Group
- Number Healthy
- Number Sick
- Number Dead
- Signs/Behavior of Sick Animals
- Signs on Dead Animals
- Other Relevant Information
- Records
- 0 records

Record 1
- AnimalID
- Condition Found
  - Age of Animal
  - Sex
  - Signs/Behavior of Animal
  - Signs on Animal Body
  - Length(cm)
  - Weight kg
  - Height(cm)
  - Girth(cm)
SMART MOBILE FOR WILDLIFE HEALTH

Field Necropsy

- AnimalID
- Date of Death
- Carcass Condition
  - Length(cm)
  - Weight (kg)
  - Height(cm)
  - Girth(cm)
  - Other Body Measurements
• Flexible

• Fast and standardize data collected

• Wildlife Health module for rangers

• Wildlife Health module for Wildlife Health Surveillance Teams

• Manuals
SMART MOBILE FOR WILDLIFE HEALTH

- Pilot in Cambodia, Laos, and Vietnam: DTRA BTRP
- National Wildlife Health Surveillance Networks
- In-country infrastructure and agencies
- Forest Services and ranger involvement
- Intoxications, AIV suspect, and ASF suspect data
SMART MOBILE AND SMART DESKTOP FOR WILDLIFE HEALTH

Data Management

Data Collection

Analysis

SMART Desktop

SMART Mobile

Objectives

Results
SMART FOR WILDLIFE HEALTH

- Surveillance networks
- Assessments per district, country, region, continent, global
- Assessments per month, year, decade, historic

Diagram showing data collection, data management, and analysis processes.
‘The biggest technical challenge facing health information sharing is “finding efficient and effective ways of combining multiple sources of complex data and information into meaningful and actionable knowledge” (Savel and Foldy 2012).’

“The future challenge will be to find effective ways to share and exchange data on a global scale so as to improve our capacity to identify new health risks in wildlife populations …”
### PPR Global Eradication Plan (2017-2021)

**Component 1 - Promoting an enabling environment and reinforcing veterinary capacities**

1. **PPR strategy and technical plans**
2. **Stakeholder awareness and engagement**
3. **Legal framework**
4. **Strengthening veterinary services**

**Component 2 - Support to the diagnostic and surveillance systems**

2.1: **Epidemiological assessment**
2.2: **Strengthening surveillance systems and laboratory capacities**
2.3: **Regional epidemiology and laboratory networks**

**Component 3 - Measures supporting PPR eradication**

3.1: **Vaccination and other PPR prevention and control measures**
3.2: **Demonstrating PPR-free status**
3.3: **Control of other small ruminant diseases in support of PPR eradication**

**Component 4 - Coordination and management**

4.1: **Global level**
4.2: **Regional level**
4.3: **National level**

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### Recommendations for wildlife integration

**Component 1 - Engage wildlife and veterinary agencies in PPRV eradication at wildlife-livestock interface**

1.1: Include wildlife in PPR GEP, regional strategies, and National Strategic Plans
1.2: Advocate for better integration of wildlife in PPR GEP
1.3: Engage wildlife agencies in planning and implementation
1.3.1: Standardize guidelines for PPR management in wildlife

**Component 2 - Support wildlife diagnostic and surveillance systems**

2.1: Increase research on epidemiological role of wildlife and determinants of susceptibility
2.2: Standardize guidelines for PPRV diagnostic tools in wildlife
2.1.2: Improve wildlife health surveillance, including via ecological monitoring and participatory methods
2.4: Include wildlife in regional epidemiology and laboratory networks

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**FIGURE 2** Main components of the PPR Global Eradication Programme (PPR GEP) (left column) and suggested additions of wildlife specific activities to the four main components (right column).
SMART FOR PPR SURVEILLANCE

flowing back from the field. A network where front line staff from Bulgaria to Bangladesh and Burundi, from Tunisia to Tajikistan and Tanzania could share their ideas and descriptions of disease, share their photos of clinical signs between themselves and with PPR-GEP would allow them to feel more involved, especially where their efforts are appreciated and acknowledged, and possibly acted upon. Raising staff interest, moral, and sense of participation in the global programme should increase disease reporting, feedback about control programmes, and early warning of problems and difficulties. With virtually all staff now possessing powerful smart phones the technology is already available in the field, all that is required is the network, and its coordination and management. Make a brief field visit anywhere

- Support PPR surveillance
- Support surveillance networks
- Involve field staff