

SMART introduction in protected areas in Central Asia

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SMART INTRODUCTION IN PROTECTED AREAS IN CENTRAL ASIA

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1. EXECUTIVE SUMMARY

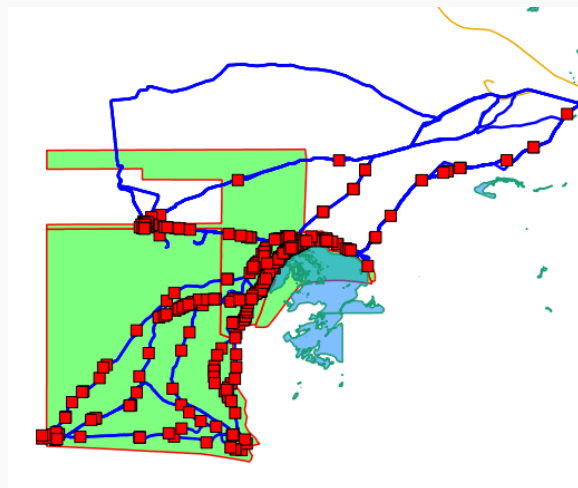
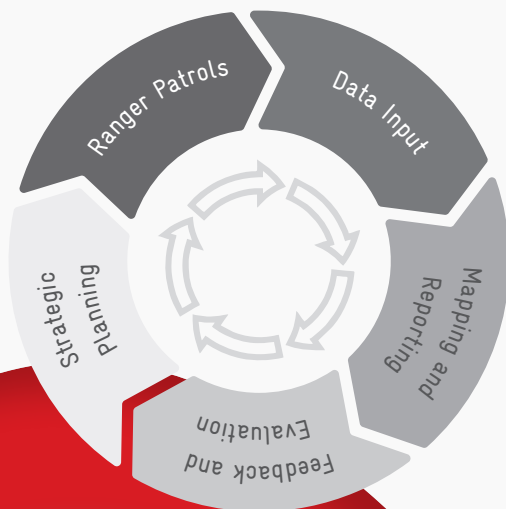
SMART (Spatial Monitoring and Reporting Tool) is emerging as a leading tool for patrol and wildlife monitoring in protected areas. Used in over 1,100 protected areas across 100+ countries, SMART is even adopted nationwide in 24 countries. This means all protected areas in these countries rely on SMART for effective management.

SMART supports various conservation efforts, including patrolling, biodiversity mon-

itoring, law enforcement, and more. By using SMART, protected areas can gain a complex understanding of threats over time and space, allowing them to adaptively adjust management strategies.

This Information Package focuses on introducing SMART for patrolling in protected areas. It's primarily aimed at protected area managers who want to implement SMART.

Figure 1: Adaptive patrol management with SMART (left). Animals observations with SMART in Southern Ustyurt National Park in Uzbekistan (right).



It contains information on following necessary steps for the introduction of SMART in a protected area:

- ✓ Preparation phase
- ✓ Trainings & capacity building for protected areas staff
- ✓ Follow Up & SMART implementation
- ✓ Conclusions & recommendations

2. INTRODUCTION

SMART is becoming the standard tool for patrol and wildlife monitoring and is presently used at more than 1,100 sites in more than 100 countries. 24 countries have adopted SMART nationwide, meaning that all protected areas in these countries use it¹.

If implemented well, SMART can produce many benefits:

- (1) The data collected via SMART allow protection managers to quickly and comprehensively understand what patrol staff are doing and where they are going. It quickly becomes obvious which patrol teams/individuals are performing well, and which are not;
- (2) When combined with an adaptive management approach based on periodic patrol reports and feedback meetings, SMART can increase performance of patrols, improve morale, and improve protection of wildlife and other natural resources;

The Information Package is based on the steps and experiences of the introduction of SMART in the Southern Ustyurt National Park in Uzbekistan. These can easily adopted to other protected areas. Adaptations to other sites mainly include differences in patrol team names, transport means and conservation target species.

- (3) A national SMART system can be created to monitor and compare the patrol activities and results of all sites with SMART in a country from any location with internet;
- (4) Migration routes and potential barriers in free migration of species can be detected easily.

While introducing SMART can be challenging, the experience at Southern Ustyurt National Park and Saigachy Reserve in Uzbekistan demonstrates its effectiveness. Launched in October 2022 with project support, these protected areas have seen impressive progress. SMART has already resulted in significant improvements (mention specific improvements, e.g., a 20% increase in patrol coverage) in both patrol volume and quality.

Motivated by this success, this Information Package outlines the key steps for successful SMART introduction and implementation, incorporating valuable recommendations based on the Uzbekistani experience.

1 Source: SMART 2022 Annual Report

3. MAIN BODY OF INFO PACKAGE

3.1. SMART approach

SMART supports a broad range of conservation efforts, including patrolling, biodiversity monitoring, and law enforcement. This Information Package focuses on its application for patrolling, which utilizes an adaptive management process.

The SMART approach uses patrol data in an adaptive cycle to continuously improve patrol quality. This monitoring relies on GIS technology (Geographic Information System), meaning all patrol data is linked spatially and displayed on maps. Rangers document their routes with GPS units and record observations with digital devices or paper forms (e.g., violations, confiscated weapons, wildlife sightings). Patrol waypoints and form data are then entered into the SMART software, which stores and links the data.

Patrol data is then processed into maps, figures, and tables showing the effort and results of individual rangers, teams, or the entire protected area. These reports are reviewed by site managers and discussed during regular ranger feedback meetings. These meetings assess past efforts, recognize strengths and weaknesses, identify missed opportunities, and set targets for improvement. Perhaps most importantly, they demonstrate to rangers that their work is valued and their input is considered. Reviews also help build morale and foster healthy competition between teams. Together, these steps form an «adaptive patrol management» cycle aimed at achieving consistent improvement in patrol quality.

3.2. Preparatory steps for the introduction of SMART as patrolling tool

his preparatory period aims to ensure that all key stakeholders (patrol staff, scientists, management, and the government as the responsible national conservation authority) are on the same page about the SMART approach. They should understand why it's being implemented and commit to its success. Here are the key steps involved:

- (1) Discussing the methodology and approach with local stakeholders.
- (2) Gathering data to design a SMART system specific to the protected area's protection system.
- (3) Purchasing equipment: Two rugged smartphones per patrol team and a computer are needed to operate SMART.
- (4) Designing tailor-made SMART patrol monitoring systems, deciding what observations related to poaching, violations, threats, and wildlife the patrol teams will collect during their patrols.
- (5) Programming the SMART database structure and other elements of the protected area into the SMART computer program. This will create systems ready for patrol data storage.
- (6) Producing a patrol data collection manual that details SMART patrol data collection procedures. This manual should describe how to document patrols and observations.

The training manuals are crucial training tools and should be ready before the ranger data collection training workshops. They also serve as reference documents for patrol teams during patrols. Importantly, documenting data collection procedures in a manual ensures consistent application by different teams across time and management changes. The manual should include:

- › General instructions (e.g., equipment needed for collecting SMART data) and principles (e.g., consistent, honest, and accurate work).
- › How to use smartphones to document patrols and observations (consider including screenshots).
- › How to submit patrol data from smartphones for storage in the SMART database.

There will be only minor variations between manuals from different sites, reflecting differences in patrol team names, transport means, and conservation target species. Additional manuals are available online by SMART in various languages [1].

At the end of the preparatory phase, a local «SMART Coordinator» will be appointed for the protected area. This person is responsible for managing and supervising the further introduction process. The SMART Coordinator should acquire a thorough understanding of both the technical aspects and managerial issues related to SMART introduction. They will also ensure the continued success of the SMART approach after the training measures are complete.

3.3. Training of staff (4-5 days)

Following the preparatory phase, a 4-5 day training program will be conducted to equip various stakeholders with the necessary skills

for using SMART. The program caters to different target groups with tailored training modules.

The first part focuses on introducing SMART as a patrolling tool for scientists and rangers. This section will include both theoretical and practical components. The theoretical component could cover topics like data collection methods, wildlife identification, and using specific features of the SMART software. Practical training might involve hands-on exercises simulating data collection during patrols.

The second part caters to SMART database operators, providing them with the in-depth knowledge required for managing and maintaining the system.

Finally, a training for managers and rangers can be offered. This training could focus on integrating SMART into their existing patrolling and law enforcement practices, or serve as a refresher course on these topics while emphasizing the use of SMART for improved data collection and analysis.

Days 1-2: SMART data collection training

The intended target groups for this training are field rangers and monitoring staff of the protected area. The purpose is to train staff on high-quality data collection with SMART during patrols and monitoring activities.

Goals:

- › Equip rangers and scientists with the knowledge and skills to collect high-quality data using SMART during patrols and monitoring activities.
- › Foster engagement and enthusiasm about SMART among rangers and scientists.

Training Components:

- › Motivational Introduction: High-ranking representatives and partners welcome participants and share inspiring stories showcasing the positive impact of SMART on conservation efforts in other protected areas.
- › Interactive SMART Introduction: This session combines a presentation on SMART (what it is, global applications, data analysis examples) with interactive elements like polls, quizzes, or group discussions to assess understanding and generate interest.
- › Presentation on Technical Aspects of Data Collection: This session will go through the SMART data collection manual provided to all participants, explaining each component in detail.
- › Outdoor Data Collection Training: Participants will engage in an outdoor training session where they practice data collection using SMART mobile devices. This will involve:
 - › Following a route with pre-defined observation scenarios (interesting photos printed and displayed along the route).
 - › Documenting these observations with details, photos, and text comments using smartphones.
 - › Back in the workshop, visualizing the recorded data as route maps and tables showing patrol effort and results.
 - › Discussing data quality, including any mistakes made during the exercise, followed by a discussion on how participant feedback can be incorporated to improve the data collection process.

This approach aims to equip participants with the necessary skills, foster ownership of the

SMART system, and create a culture of continuous improvement in data collection.

Days 3-4: Training of SMART database operators

Ideally, two local staff members with experience in database management software should be available in a protected area. These individuals will be trained as «SMART Database Managers» to handle data entry, quality control, and data processing. They will learn to:

- › Use the SMART computer program to enter data, check the quality of patrol data submitted by rangers and scientists, and store it in the SMART database.
- › Process the data into maps, figures, and tables showing patrol routes, effort expended, and results. These visualizations will be used for patrol planning, performance evaluation, and communication with park management.

Training for SMART Database Managers will cover:

- › Introduction to the main modules of the SMART program.
- › Installing data models on smartphones with SMART mobiles.
- › Basic data processing for patrol debriefing, including creating queries.
- › Exporting and sharing patrol data and system backups.

Following the training sessions, a testing period of 1-4 months will be initiated. During this time, patrol teams will receive additional data collection training in the field. The testing period will assess various aspects of the system, including:

- › Data collection procedures and the rangers' ability to implement them.
- › Data flow and communication between rangers and database managers.
- › Overall system functionality to identify and address any shortcomings.
- › The testing period concludes when good quality data is consistently collected on all patrols.

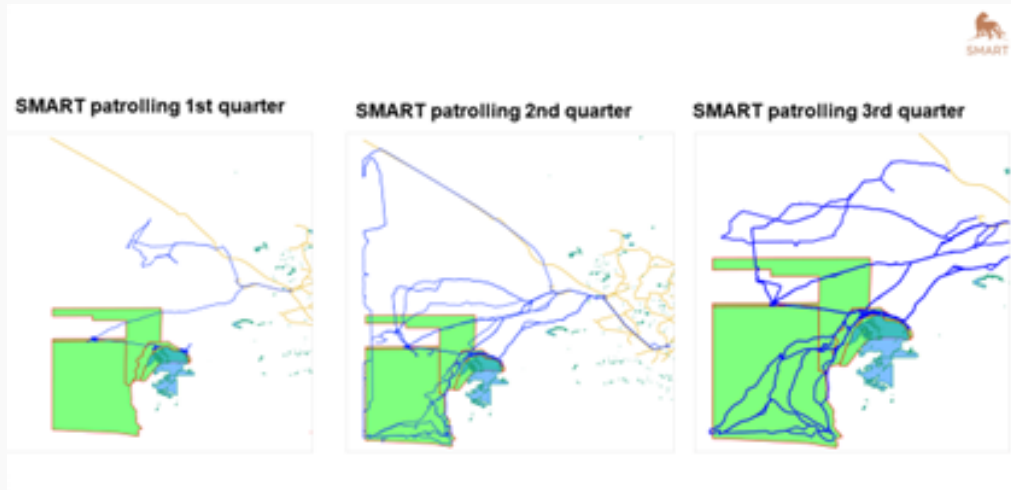


Figure 2: SMART patrolling routes of different quarters in Southern Ustyurt National Park (Uzbekistan)

Once data collection is consistent and accurate across all patrol teams, and any identified issues are resolved, SMART can be officially launched. The program then transitions into a cycle of continuous improvement. Patrol data will be processed into quarterly reports

that analyze patrol performance and establish targets for the next period. These reports will be discussed during regular patrol meetings, fostering collaboration and ensuring all teams are working towards achieving shared conservation goals.

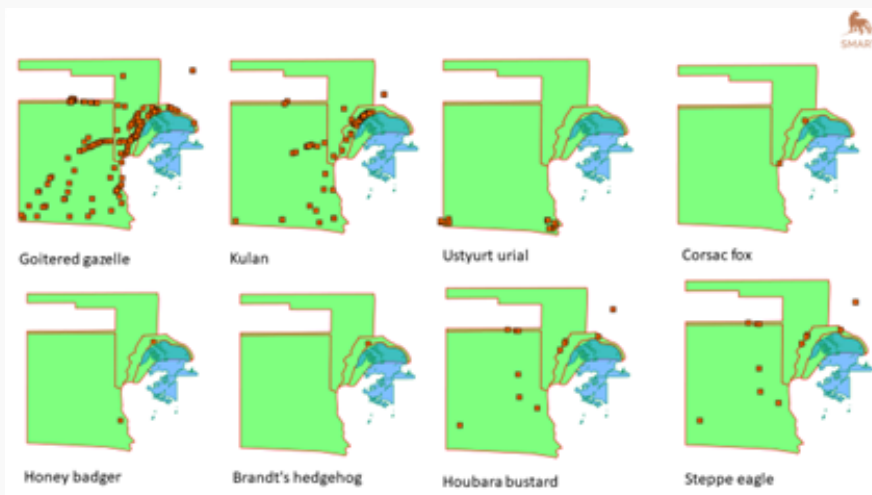


Figure 3: Observations of red list species in Southern Ustyurt National Park (Uzbekistan)

After about one year of SMART use, annual in-depth patrol data analysis can begin. This analysis will monitor long-term trends in various areas, such as patrol quality, populations of protected target species, poaching incidents, and the nature of threats.

Optional: Advanced Training on Patrolling & Law Enforcement

With increasing pressure from wildlife threats, park managers need to make quick and effective decisions. Ranger teams need to be strategically deployed to respond to threats, apprehend poachers, dismantle snares and traps, and ultimately prevent wildlife crime.

This optional training session aims to strengthen the capacity of rangers, particularly those with [previous experience level/basic training], to effectively respond to illegal activities, especially poaching. The training will also explore opportunities for collaboration between rangers and border guards. The program will cover a wide range of law enforcement and conflict resolution techniques. It will feature simulations of various poaching scenarios that national park officers might face, equipping them with the necessary skills to handle these situations effectively.

	TARGET GROUP	TRAINING CONTENTS	METHODOLOGY
Day 1	Rangers & scientific staff	<ul style="list-style-type: none"> > Introduction to SMART: What is SMART, presentation on application of SMART worldwide, examples of SMART data analyses). > Presentation on technical aspects of data collection based on a SMART data collection manual that will be provided to all rangers. Basically, this presentation should discuss one-by-one all the components of the manual. 	Presentations
Day 2	Rangers & scientific staff	<ul style="list-style-type: none"> > Outdoor training in data-collection with SMART mobile. 	Field training
Day 3	Database operators from staff	<ul style="list-style-type: none"> > Introduction to the main modules of the SMART program > Installing data-models on a smartphone with SMART mobiles > Simple data processing for patrol debriefing (create queries) > Exporting and sharing patrols and system backups 	Practical exercises
Day 4	Database operators from staff	<ul style="list-style-type: none"> > Simple data processing for patrol debriefing (create queries) > Exporting and sharing patrols and system backups 	Practical exercises
Day 5	Manager & rangers	Training on patrolling & law enforcement: <ul style="list-style-type: none"> > Identification of illegal activities in the national park > Legal background to execute responses to combat illegal activities > Identification of opportunities for collaboration between rangers and border guards > Conflict resolution techniques 	Presentations & practical exercises

Table 1: Overview of possible training program on SMART introduction

3.4. Follow-up workshop

Following approximately one year of implementation, a comprehensive evaluation of the protection quality and SMART patrolling procedures should be conducted. This evaluation aims to identify areas for further improvement and ensure the system is operating at its full potential.

The evaluation will assess several key aspects:

Achievement of Patrolling Goals: Have the established patrolling goals been met? This could involve analyzing data on patrol coverage, response times, or threat reduction.

- › Effectiveness of SMART System: Is the SMART system functioning as intended?

This might involve assessing data collection procedures, data quality, and the utility of the generated reports for decision-making.

- › Need for System Adjustments: Based on the evaluation findings, are there any necessary changes to the SMART system? This could encompass adjustments to data collection protocols, data storage and management practices, or even the incentive system for rangers.
- › By implementing these evaluation measures, park management can ensure continuous improvement of the SMART system and its effectiveness in achieving conservation goals.

	TARGET GROUP	TRAINING CONTENTS	METHODOLOGY
Day 1	Managers, rangers & scientific staff	› Evaluation: assessment of quantity & quality of data collected, performance of rangers, scientists and data managers, threats & risks, approach appropriate to meet conservation goals?	Presentations & practical exercises
Day 2	Managers, rangers & scientific staff	› Elaboration of measures to further improve the procedures, e.g. changes in data collection procedures, data storage and management, incentive system.	Presentations & practical exercises
Day 3	Managers, rangers & scientific staff	› Train based on lessons learnt in the field. Overcome barriers & shortcomings.	Presentations & practical exercises

Table 2: Draft schedule of a follow-up workshop

4. CONCLUSION AND RECOMMENDATIONS

Successful introduction of SMART in protected areas requires a well-coordinated effort from various stakeholders. While technical aspects are often manageable, overcoming resistance to change and ensuring consistent data collection can be challenging.

Key Requirements for Success:

- (1) **Stakeholder Commitment:** All relevant stakeholders (patrol staff, conservation managers, national conservation agencies) should agree to implement SMART. Understanding its purpose and benefits fosters a collaborative environment. Integrating SMART introduction into the park management plan demonstrates commitment.
- (2) **SMART Coordinator:** Appoint a dedicated «SMART Coordinator» with expertise in both technical aspects and managerial issues. This individual oversees the implementation process.
- (3) **SMART Database Managers:** Ideally, two local staff members with strong computer skills should be trained as «SMART Database Managers.» They will manage data entry, quality control, and data processing tasks. This includes storing data, generating reports, and creating visualizations (maps, figures, tables) to analyze patrol effort and results. The time commitment for data management varies depending on patrol frequency and volume (estimated 1-3 days per week).
- (4) **Protection Managers with Analytical and Management Skills:** Park managers need a deep understanding of local conservation threats and effective patrol strategies. Additionally, strong analytical skills are crucial to evaluate patrol quality using SMART reports. Finally, good management skills are essential to:
 - (5) Ensure proper data collection by patrol teams.
 - (6) Utilize SMART data to adapt and improve patrol activities.
 - (7) Provide feedback and recommendations during regular patrol meetings.
 - (8) **Sufficient Funding and Patrol Capacity:** Adequate resources are necessary to support increased patrolling efforts. This includes sufficient patrol staff, transportation, fuel, vehicle repairs, and equipment (smartphones, batteries, chargers, cameras). Consider long-term financial planning for potential incentive programs to reward high-performing rangers. Initial support from external experts might be needed for system design and implementation.
 - (9) **Institutionalizing SMART Use:** National-level institutionalization of SMART benefits all protected areas in the country. The goal is to develop independent capacity to manage SMART without relying solely on external support.
 - (10) **Ranger Biodiversity Skills:** Regular training sessions are essential to improve the rangers' recognition and identification skills for animal observations collected during patrols. This directly impacts the quality and accuracy of biodiversity data.

Additional Considerations:

- › Motivation and Incentives: Strategies to address initial resistance or lack of motivation among rangers regarding data collection could include incorporating incentive programs or gamification elements.
- › Data Quality Assurance: Techniques like data validation by supervisors or periodic audits can help ensure data quality beyond ranger training.
- › Long-Term Sustainability: Institutionalizing SMART use nationally and integrating SMART training and support into park management budgets can ensure long-term sustainability beyond initial project funding.

By addressing these requirements and considerations, protected areas can successfully implement SMART and leverage its valuable data for improved conservation decision-making.



