



ENHANCING FINANCIAL SUSTAINABILITY OF THE PROTECTED AREAS SYSTEM IN GEORGIA

Technical support to prioritize biodiversity monitoring indicators (species and habitats) for 10 Georgian PAs to support the development of standardized PA-specific Management Effectiveness Assessment plans (*Biodiversity Monitoring Indicators*)

Deliverable 2:

Short List of Indicators for Biodiversity Monitoring on the Target Protected Areas

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Abbreviations

APA	Agency of Protected Areas
CNF	Caucasus Nature Fund
GEF	Global Environment Facility
GIZ	German Development Agency
MEPA	Ministry of Environmental Protection and Agriculture
NFI	National Forest Inventory
UNDP	United Nations Development Programme

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1 Introduction

The objective of the Technical Assistance Grant Agreement between the **Caucasus Nature Fund** and the author, signed on 15 May 2020, is to provide technical support to prioritize biodiversity monitoring indicators (species and habitats) for 10 Georgian PAs to support the development of standardized PA-specific Management Effectiveness Assessment plans (*Biodiversity Monitoring Indicators*). The target PAs for this assignment include: Borjomi-Kharagauli National Park (BKNP), Javakheti PA, Vashlovani PA, Kazbegi PA, Algeti PA, Pshav-Khevsureti PA, Kintrishi PA, Tusheti PA and Tusheti Protected Landscape.¹

The specific objectives of the assignment are:

1. Identification of draft set of criteria for the prioritization of the biodiversity value / state indicators
2. Prioritization of the biodiversity value/state indicators for target PAs based on agreed set of criteria
3. Elaboration of monitoring methodologies for each prioritized indicator for short listed/prioritized indicators
4. Developing a 10-year biodiversity monitoring plan for target PAs.

This report describes the work carried out for achieving the first and second specific objectives and presents **Deliverable 2: Final and agreed set of criteria for prioritization of indicators (including a brief report of the meeting with stakeholders); Google document for the prioritization of short list indicators; final list of short list indicators agreed with beneficiaries and stakeholders for each target PA specifying the causal links with threats/pressures and general recommendations for management response; MoMs for all important meetings reflecting agreements reached, including the final consultation workshop.**

2 The process of selecting biodiversity indicators

The analysis of the past efforts and lessons learnt in relation to biodiversity monitoring in Georgia's protected areas suggested that it was critically important that each selected species or habitat would be (i) correctly chosen from the biological viewpoint and be suitable for the purpose of helping achieve effective and adaptive management of a given PA, thus implying that the process had to be expert-driven and (ii) practical from the management point of view and adequate to available resources. Therefore, the process involved all the relevant leading experts as well as key stakeholders to elaborate a final agreed and prioritised (short) list of biodiversity indicators in several consecutive steps (see Fig. 1)

¹ MtNP and MaNP have been also included in the list of indicators.

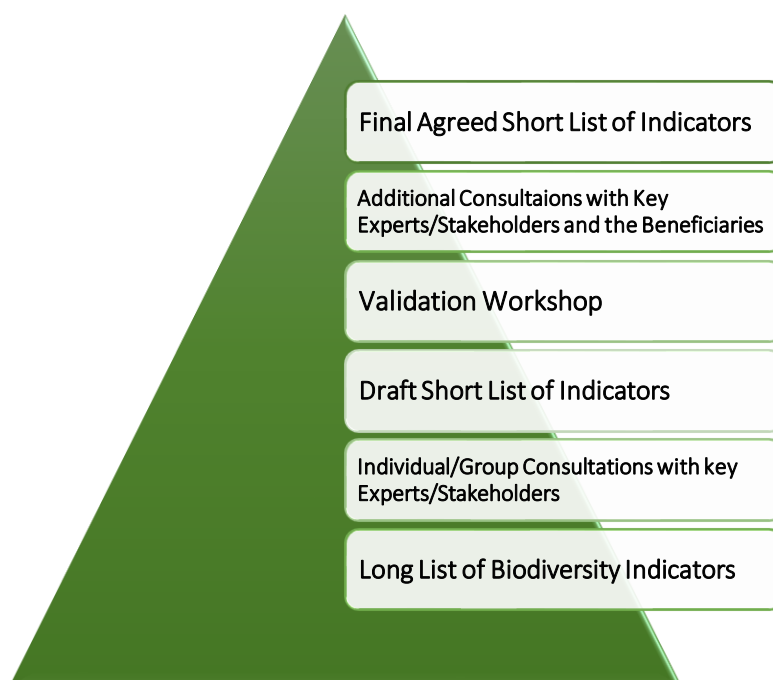


Fig. 1. The process of selecting agreed prioritised list of biodiversity indicators.

3 Criteria for prioritization of indicators

A draft set of criteria for the prioritization of the indicators was prepared based on the following: existing PA management plans, practicality, cost-effectiveness, feasibility, national and international significance, link to NBSM etc. The criteria were grouped into two main categories: (1) technical criteria and (2) management criteria.

Draft criteria:

I. Technical (scientific and conservation) criteria:

1. Indicators (species and habitats) identified in PA management plans
2. National significance (such as red listed species, outstanding economic or social significance, etc.)
3. International and regional significance such as Emerald species and habitats.
4. Indicators of threats to biodiversity (such as poaching, excessive grazing, pathogens, timber extraction, tourism, climate change, etc.)
5. Invasive species
6. National biodiversity indicators
7. Etc.

II. Management criteria:

- Practicality – *How effectively can the results of the indicator monitoring be translated into the management of the given PA?*
- Cost-effectiveness – *What are the available methods (those that can yield credible results) and how accessible and cost-effective are they?*
- Feasibility – *Do/will we have sufficient human and financial resources necessary to implement the indicator?*

The draft criteria were then discussed with the beneficiary (APA, MEPA), key stakeholders and leading experts from all relevant fields of botany and zoology, having the experience of working with PAs and/or in the field of biodiversity monitoring. We had individual or group virtual meetings (via Skype or Zoom) as well as physical meetings (see Annex 1 for the minutes of the meetings). The flora and habitat experts noted that while the draft proposed technical criteria were focussed on specific species and were probably suitable for fauna indicator species, they were less relevant for flora species since specific flora species or specific habitat types were unlikely to serve as good indicators for biodiversity monitoring on protected areas. Thus, an entirely different approach was proposed to identify flora biodiversity indicators, namely instead of focussing on individual species it was recommended to use the following wider classes or groupings: grasslands, forests and invasive plants. Thus the subsequent process of identifying flora indicators for biodiversity monitoring on the target PAs was based on this approach. The management criteria remained the same.

On the other hand, the draft technical and management criteria were anonymously accepted by all the key experts and later adopted in the physical workshop on fauna indicators held on 4th May, 2020 (see Annex 2 for the combined list of stakeholders and experts, and Annex 3 for the list of participants of the workshop on fauna indicators). The final agreed list of criteria based on which the fauna indicators were later selected is presented in Annex 5.

4 Selection of Priority Biodiversity Indicators

4.1 Primary (long) list of biodiversity indicators

The first step was to create a primary (long) list of biodiversity indicators that would be later discussed with key experts and stakeholders. We analysed all existing information and documents such as the management plans (or similar documents) of the target protected areas and other legal or policy documents in which PA goals and objectives were set out and the main values as well as current threats and priorities were described. We then composed a long working list of biodiversity indicators for each of the target PAs to serve as the baseline information for further prioritization. This list was organized in a table and included the descriptions of actual or estimated status of the indicator (species/habitat) if available as well as potential or actual pressures that affect them. The understanding of current and potential threats to each of the indicator helped us analyse the causal link between the state of indicator and the threats/pressures as well as elaborate on the potential of improved management effectiveness i.e. possible management responses that could be proposed in order to reduce the pressures/threats and eventually improve the status of the indicator (see Annex 4: Long List of Biodiversity Monitoring Indicators for Target PAs).

4.2 Short list of biodiversity indicators

Together with the draft selection criteria, the above-mentioned short list of indicators was discussed with the beneficiary (APA, MEPA), key stakeholders and leading botanists and zoologists with the experience of working with PAs and/or in the field of biodiversity monitoring. We conducted individual or group virtual meetings (via Skype or Zoom) as well as physical meetings, where possible (see Annex 1 for minutes of key meetings; Annex 2 for the combined list of stakeholders and experts, involved in the process).

It was originally intended to create a google document, presumably in English, on Google Drive (or similar platform) with open access where the prioritization process could be observed by the beneficiaries and stakeholders on a regular basis while allowing them to provide comments and contributions. However, it

became clear that creating a Google document would not be an effective means for ensuring maximum participation due to the fact that the key experts seemed unlikely to visit and make changes into that document. The language issue was also noted as a potential barrier. After consulting the issue with CNF, it was decided to skip this step and instead entirely rely on individual and group meetings and exchange of draft documents through email.

4.2.1 Fauna indicators

The comments and suggestions received from the key experts were analysed and incorporated into the primary list of indicators to produce the draft version of prioritised short list of indicators. Later the draft short list was presented at the final validation workshop on fauna indicators, attended by the majority of key experts and stakeholders (see Annex 3 for the list of participants of the workshop on fauna indicators). While the previous stage was highly specialized i.e. involved individual or group meetings with experts from specific fields of expertise such as ornithology, small mammals, large mammals, ichthyology, etc., the workshop was attended by all the key experts that had been individually consulted before. Thus, every participant had a chance to review and comment on suggestions and views of their colleagues from other zoological sub-disciplines. As a result of lively discussions and additional comments received during the workshop, we further updated the short list of fauna indicators.

While working on the updating of the draft short list, it was noted that (i) the new short list of priority indicators still contained a rather high number of indicators, (ii) several indicators in fact overlapped in the threats/pressures or condition they were selected to respond to or indicate (e.g. woodpeckers, forest bats and squirrel were each proposed to monitor forest condition) and (iii) some indicators would require specialised approach i.e. very specific monitoring activities and careful planning as well as trained skilful observers, and could not be monitored via routine patrolling or other forms of activities already happening on PAs; other indicators, on the other hand, would not require such specialised approach and would be best monitored via other common activities – field data for such indicators could be collected as a “by-product” of such activities as patrolling by rangers, nature viewing by visitors, etc.

Based on the above analysis, we further categorised and prioritised the short-listed indicators into:

- (1) *High priority indicators for specific monitoring*
- (2) *Medium priority indicators for specific monitoring*
- (3) *Priority indicators for non-specific monitoring.*

Subsequently, additional meetings were held with the beneficiaries – APA and MEPA – to finalise the short list of fauna indicators (see Chapter 6).

4.2.2 Flora, Habitats and forest pathogens

The comments and suggestions received from the botanists were analysed and incorporated into the primary list of indicators to produce the draft version of prioritised short list of indicators for flora, habitats and forest pathogens (see Annex 6). Originally, it was planned to organise a specialised validation workshop for flora, habitats and forest pathogen indicators, similar to that held for fauna indicators. However, the finalisation process of these indicators was delayed due to the following: while all leading botanists suggested that forest

monitoring was a high priority for all PAs with significant forest cover, and that the monitoring should rely on permanent sample plots, it was also proposed that the process should be carried in compliance and full synergy with the national forest inventory (NFI) – the process that was recently launched and is expected to be completed later 2020. NFI covers the whole country including PAs and employees a grid-based sampling technique involving the recording of up to 70 variables in each permanent sample plot. We had additional meetings with the beneficiaries (APA and MEPA) as well as experts and project leaders of NFI. While there seems to be a consensus that the forest monitoring activities on the protected areas should be harmonised with NFI and only additional sampling should be carried out to supplement the data already collected through NFI, more discussions are needed to reach a final agreement as to how forest monitoring on PAs should further proceed. According to the MEPA officials, they are also planning to elaborate special regulations as to how forest inventory/monitoring will be conducted on protected areas *vis-à-vis* the forests outside the PA system. Therefore, it was decided to come back to the issue of forest monitoring on protected areas after the relevant regulations have been drafted. On the other hand, it was agreed that monitoring invasive alien species was a high priority for many PAs, especially for the Adjara protected areas.

5 Emerald species

Each of the target PA has a number of Emerald species – species, listed in Resolution No.6 of the Standing Committee of the Bern Convention. Some PAs are particularly with as many as more than 20 rich in non-avian Emerald species alone. While the country is obliged by the Bern convention to monitor all species included in Res. No. 6, according to the experts, many of them can not be used as indicators for PA management effectiveness or adaptive management due to their ecology or current population status – some of these species are so rare that their use for routine monitoring is not possible. On the other hand, some emerald species such as brown bear, lynx, bezoar goat and several woodpeckers were selected as high or medium priority indicators for the target PAs.

6 Agreed Final List of Priority fauna Indicators

6.1 High Priority Indicators for Specific Monitoring Activities

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
ALGETI NATIONAL PARK				
Mammals				
1. Brown bear (<i>Ursus arctos</i>)		<ul style="list-style-type: none"> - Poaching - Disturbance 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Reduce/control human presence in certain areas/times - Awareness raising 	<p>Important indicator in the national monitoring context; Emerald species.</p> <p>Suggested method: Census by non-invasive genetic method</p>
2. European hare (<i>Lepus europaeus</i>)		<ul style="list-style-type: none"> - Poaching - Overgrazing - Disturbance by dogs etc. 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Ensure sustainable grazing 	
Birds				
3. Woodpeckers		– Indicator of forest condition	Reduce pressure on forests and/or implement special measures	Relatively easy to monitor; Some are Emerald spp.
MTIRALA NATIONAL PARK				
Mammals				
1. Brown bear (<i>Ursus arctos</i>)		<ul style="list-style-type: none"> – Poaching, – Persecution as a result of human-bear conflict (HBC) 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Mitigate HBC – Awareness raising 	<p>Important indicator in the national monitoring context; Emerald species.</p> <p>Suggested method: Census by non-invasive genetic method</p>
2. Ungulates: chamois and roe deer		<ul style="list-style-type: none"> – Poaching, – Disturbance 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Regulate tourism 	Suggested method: index counts by camera trapping.
Birds				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
3. Woodpeckers		Indicator forest condition	– Reduce pressure on forests and/or implement special forest conservation measures	Relatively easy to monitor; Some are Emerald spp.
Reptiles and Amphibians				
4. Caucasian salamander (<i>Mertensiella caucasica</i>)	Total survey throughout the range conducted in 2019	Indicator of non-conservation friendly forestry practices (such as log pulling in stream beds)	– Eradicate harmful forestry practices – Awareness raising	
Fishes				
5. Brown trout (<i>Salmo fario</i>)		- illegal fishing	- Strengthen law enforcement;	
KINTRISHI PROTECTED AREAS				
Mammals				
1. Brown bear (<i>Ursus arctos</i>)		– Poaching, – Persecution as a result of human-bear conflict (HBC)	– Strengthen law enforcement; – Mitigate HBC – Awareness raising	Important indicator in the national monitoring context; Emerald species. Suggested method: Census by non-invasive genetic method
2. Ungulates: chamois and roe deer		– Poaching, – Disturbance	– Strengthen law enforcement; – Regulate tourism	Suggested method: index counts by camera trapping and direct observation
Birds				
3. Woodpeckers		Indicator of forest condition	Reduce pressure on forests and/or implement special forest conservation measures	Relatively easy to monitor; Some are Emerald spp.
Reptiles and Amphibians				
4. Caucasian salamander (<i>Mertensiella caucasica</i>)	Total survey throughout the range conducted in 2019	Indicator of non-conservation friendly forestry practices (such as log pulling in stream beds)	– Eradicate harmful forestry practices	
Fishes				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
5. Brown trout (<i>Salmo trutta</i>)		- illegal fishing	- Strengthen law enforcement;	
MACHAKHELA PROTECTED AREAS				
Mammals				
1. Brown bear (<i>Ursus arctos</i>)		- Poaching, - Persecution as a result of human-bear conflict	- Strengthen law enforcement; - Mitigate HBC - Awareness raising	Important indicator in the national monitoring context; Emerald species. Suggested method: Census by non-invasive genetic method
2. Ungulates: chamois and roe deer		- Poaching, - Disturbance	- Strengthen law enforcement; - Regulate tourism	Suggested method: index counts by camera trapping and direct observation
Birds				
3. Woodpeckers		Indicator of forest condition	Reduce pressure on forests and/or implement special forest conservation measures	Relatively easy to monitor; Some are Emerald spp.
Reptiles and Amphibians				
4. Caucasian salamander (<i>Mertensiella caucasica</i>)	Total survey throughout the range conducted in 2019	Indicator of non-conservation friendly forestry practices (such as log pulling in stream beds)	- Eradicate harmful forestry practices	
VASHLOVANI PROTECTED AREAS				
Mammals				
1. Brown bear (<i>Ursus arctos</i>)	Extremely small population; Up 10 individuals.	- Poaching, - Illegal killing at nearby agricultural fields	- Strengthen law enforcement; - Reduce/control human presence in certain areas/times - Awareness raising	Important indicator in the national monitoring context; Emerald species. Suggested method: Census by non-invasive genetic method

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
2. Goitered gazelle (<i>Gazella subgutturosa</i>)	Increasing	<ul style="list-style-type: none"> - Poaching; - Disturbances associated with livestock grazing and tourism. 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Reduce/control human presence in certain areas/times - Expand PA - Awareness raising 	Suggested method: Direct observation on standardized transects
3. Eurasian lynx (<i>Lynx lynx</i>)	10-15 individuals	<ul style="list-style-type: none"> - Poaching; - Depletion of food base (chukar, hare, etc.). 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	Last assessment was carried out in 2012
4. European hare (<i>Lepus europaeus</i>)		<ul style="list-style-type: none"> - Poaching - Overgrazing (indicator of condition of grasslands) - Sheep dogs 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Sustainable pasture management 	
Birds				
5. Vultures: Bearded vulture, Egyptian vulture, Griffon		<ul style="list-style-type: none"> - Persecution 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	<p>Monitoring site: the Eagle canyon.</p> <p>Suggested approach/method: Monitor active nests.</p> <p>Need to be seen in the light of national monitoring context. National priority.</p>
6. Pheasant (<i>Phasianus colchicus</i>)		<ul style="list-style-type: none"> - Poaching; - Disturbance associated with grazing; - Field fires. 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	
7. Black stork		<ul style="list-style-type: none"> - Tourism and other disturbance 	<ul style="list-style-type: none"> - Regulate visitor numbers and behaviour 	Eagle canyon
JAVAKHETI PROTECTED AREAS				
Birds				
1. Migratory water birds		<ul style="list-style-type: none"> - Illegal hunting 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
		- Disturbance	- Awareness raising	
2 Nesting colonial water birds (Armenian gull, Dalmatian pelican, great white pelican)		- Illegal hunting; - Disturbance.	- Strengthen law enforcement; - Awareness raising	
3 Ruddy shellduck (<i>Tadorna ferruginea</i>)		- Illegal hunting; - Disturbance.	- Strengthen law enforcement; - Awareness raising - Strictly protect moulting sites at lakes Bughdasheni and Kartsakhi	
4 Common crane (<i>Grus grus</i>)		- Indicator of undisturbed area/protection level	- Reduce disturbance	Important in the national and global context
Fishes and freshwater invertebrates				
5. Benthic macroinvertebrates and fish composition in Javakheti lakes	Baseline exist	Indicator of water quality and overfishing	- Fishing management; - livestock watering management at lakes	Kartsakhi assessed in 2019. Khanchali and Madatapa assessed in 2014-2017 by ilia state university. Yearly monitoring is recommended
TUSHETI PROTECTED AREAS AND TUSHETI PROTECTED LANDSCAPE				
Mammals				
1. Bezoar Goat (<i>Capra aegagrus</i>)	Approx. 310 individuals	- Poaching; - Disturbance	- Strengthen law enforcement; - Improve tourism management; - Awareness raising	Suggested approach/method: Direct observations. Last assessment was carried out in 2013
2. East Caucasian tur (<i>Capra cylindricornis</i>)	Approx. 1500 individuals	- Poaching; - Disturbance	- Strengthen law enforcement; - Improve tourism management; - Awareness raising	Suggested approach/method: Direct observations. Last assessment was carried out in 2014
3. Red deer (<i>Cervus elaphus</i>)		- Poaching; - Disturbance	- Strengthen law enforcement; - Improve tourism management;	Suggested approach/method:

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
			– Awareness raising	Direct observations, camera trapping.
Birds				
5. Woodpeckers		Indicator of forest condition	Improve or accordingly plan forest management.	Relatively easy to monitor; Some are Emerald spp.
Fishes				
6. Brown trout (<i>Salmo trutta</i>)		- illegal fishing	- Strengthen law enforcement;	
PSHAV-KHEVSURETI PROTECTED AREAS				
Mammals				
1. Bezoar Goat (<i>Capra aegagrus</i>)	About 50 individuals	– Poaching; – Disturbance – Tourism	– Strengthen law enforcement; – Awareness raising	Suggested approach/method: Direct observations. Last assessment was carried out in 2013.
2. Eastcaucasian tur (<i>Capra cylindrcornis</i>)	70-143 individuals	– Poaching; – Disturbance	– Strengthen law enforcement; – Awareness raising	Suggested approach/method: Direct observations. Last assessment was carried out in 2014
3. Brown bear (<i>Ursus arctos</i>)		– Poaching		Suggested approach/method: non-invasive genetic method Important in the context of the national monitoring.
Birds				
4. Woodpeckers		Indicator of forest condition	Improve forest management practices as appropriate	Pshavi area. Easy to monitor; Some are Emerald spp. (in managed reserve)
Fishes				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
5. Brown trout (<i>Salmo trutta</i>)		- illegal fishing	- Strengthen law enforcement;	
LAGODEKHI PROTECTED AREAS				
Mammals				
1. Red deer (<i>Cervus elaphus</i>)	Minimum 74 individuals	- Poaching; - Disturbance incl. from tourists	- Strengthen law enforcement; - Improve tourism management; - Awareness raising	Suggested approach/method: pallet group counts. Last assessment was carried out in 2018
2. Eastcaucasian tur (<i>Capra cylindricornis</i>)	Minimum 505 individuals	- Poaching; - Disturbance incl. from tourists	- Strengthen law enforcement; - Improve tourism management; - Awareness raising	Suggested approach/method: Direct observations. Last assessment was carried out in 2019
3. Brown bear (<i>Ursus arctos</i>)		- Poaching; - Disturbance incl. from tourists	- Strengthen law enforcement; - Reduce/control human presence in certain areas/times	Suggested method: Census by non-invasive genetic method Important indicator in the national monitoring context; Emerald species.
Birds				
4. Woodpeckers		Indicator of forest condition	Improve forest management practices as appropriate	Easy to monitor; Some are Emerald spp. (in managed reserve)
KAZBEGI PROTECTED AREAS				
Mammals				
1. Eastcaucasian tur (<i>Capra cylindricornis</i>)	About 800 individuals	- Poaching; - Disturbance incl. from tourists and sheep grazing	- Strengthen law enforcement; - Improve tourism management; - Awareness raising	Suggested approach/method: Direct observations.

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
				Last assessment was carried out in 2014
2. Brown Bear (<i>Ursus arctos</i>)		<ul style="list-style-type: none"> – Poaching; – Disturbance 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Reduce/control human presence in certain areas/times 	Important indicator in the national monitoring context; Emerald species. Suggested method: Census by non-invasive genetic method
3. Long-clawed mole vole (<i>Prometheomys schaposchnikovi</i>)		<ul style="list-style-type: none"> – Overgrazing; – Disturbance 	<ul style="list-style-type: none"> - Improve pasture management and/or grazing practices as appropriate - Restrict human presence in specific areas 	Very sensitive species; Endemic genus/species with fragmented range.
Birds				
4. Bearded vulture (<i>Gypaetus barbatus</i>)		<ul style="list-style-type: none"> – Persecution 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	
5. Eurasian griffon (<i>Gyps fulvus</i>)		<ul style="list-style-type: none"> – Persecution – Helicopter flights – Tourism (such as recreational infrastructure incl. a zipline and operation) 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	
6. Great rosefinch (<i>Carpodacus rubicilla</i>)		<ul style="list-style-type: none"> – Habitat destruction 	Protect habitat/wintering sites	Monitor wintering sites.
7. Guldenstadt's Redstart (<i>Phoenicurus erythrogastrus</i>)		<ul style="list-style-type: none"> – Habitat destruction 	Protect habitat/wintering sites	Monitor wintering sites
BORJOMI-KHARAGAULI NATIONAL PARK				
Mammals				
1. Red deer (<i>Cervus elaphus</i>)	300-500 individuals	<ul style="list-style-type: none"> – Poaching; – Disturbance incl. from tourists – Large infrastructure development 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Reduce/control human presence in certain areas/times 	Suggested approach/method: pallet group counts. Last assessment was carried out in 2015

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
2. Brown bear (<i>Ursus arctos</i>)	38-47 individuals	<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists Large infrastructure development 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	<p>Important indicator in the national monitoring context; Emerald species. Suggested method: Census by non-invasive genetic method</p> <p>Last assessment was carried out in 2014.</p>
Birds				
3. Caspian Snowcock (<i>Tetraogallus caspius</i>)		<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists and sheep grazing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism and grazing management 	Monitoring should focus on the Zekari pass area (Important in the light of new road infrastructure project)
4. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)		<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists and sheep grazing. 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism and grazing management. 	Monitoring should focus on the Zekari pass area (Important in the light of new road infrastructure project)
5. Velvet scoter (<i>Melanitta fusca</i>)		<ul style="list-style-type: none"> - Poaching; - Egg collection; - Unsustainable mowing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Ban/control egg collection - Protect specific sites. 	Monitoring site: Ktsia-Tabatskuri Lake
6. Woodpeckers		Indicator of forest condition	<ul style="list-style-type: none"> - Improve forest management / fuelwood extraction practices 	Relatively easy to monitor; Some are Emerald spp.
Reptiles and Amphibians				
7. Caucasian salamander (<i>Mertensiella caucasica</i>)	Total survey throughout the range conducted in 2019	Indicator of non-conservation friendly forestry practices (such as log pulling in stream beds)	<ul style="list-style-type: none"> - Eradicate harmful forestry practices 	
Fishes				
8. Brown trout (<i>Salmo trutta</i>)		<ul style="list-style-type: none"> - illegal fishing 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
9. Benthic macroinvertebrates and fish composition in Javakheti lakes	Baseline exist	Indicator of water quality and overfishing	<ul style="list-style-type: none"> - Fishing management; - livestock watering management at lakes 	Only in Tabatskuri lake. Baseline carried out by Guchmanidze

6.2 Medium priority indicators for specific monitoring activities

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
ALGETI NATIONAL PARK				
Mammals				
1. Roe deer (<i>Capreolus capreolus</i>)		<ul style="list-style-type: none"> - Poaching - Disturbance - Diseases 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Reduce/control human presence in certain areas/times; - Plan a timely special response measure if disease is detected. 	
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		Degradation of deciduous forest. (outcompeted by the red squirrel in mixed forest)	Reduce pressure on deciduous forests	
3. Bats (<i>Chiroptera</i>)		Indicator of forest condition	Reduce pressure on forests and/or implement special forest conservation measures	
MTIRALA NATIONAL PARK				
Mammals				
1. Bats (<i>Chiroptera</i>)		– Indicator of forest condition	– Reduce pressure on forests and/or implement special forest conservation measures	

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		– Degradation of forest. (outcompeted by the red squirrel)	– Reduce pressure on forests and/or implement special forest conservation measures	
KINTRISHI PROTECTED AREAS				
Mammals				
1. Bats (<i>Chiroptera</i>)		Indicator of forest condition	Reduce pressure on forests and/or implement special forest conservation measures	
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		Degradation of forest. (outcompeted by the red squirrel in mixed forest)	Reduce pressure on forests and/or implement special forest conservation measures	
Birds				
3. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)		- Poaching; - Grazing	- Strengthen law enforcement; - Regulate grazing	NP has C. grouse monitoring plan
Reptiles and Amphibians				
4. Caucasian parsley frog (<i>Pelodytes caucasicus</i>)		- Health of freshwater ecosystem	-	Monitoring of tadpoles. Monitoring frequency - once in 5 years.
MACHAKHELA PROTECTED AREAS				
Mammals				
1. Bats (<i>Chiroptera</i>)		Indicator of forest condition	Reduce pressure on forests and/or implement special forest conservation measures	
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		Degradation of forest. (outcompeted by the red squirrel in mixed forest)	Reduce pressure on forests and/or implement special forest conservation measures	
3. Reptiles and Amphibians				
4. Caucasian parsley frog (<i>Pelodytes caucasicus</i>)		- Health of freshwater ecosystem	-	Monitoring of tadpoles. Monitoring frequency - once in 5 years.
VASHLOVANI PROTECTED AREAS				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
Mammals				
5. Small five-toed jerboa (<i>Allactaga elater</i>)		- Overgrazing, - Desertification	- Sustainable pasture management	Are very good PHD project.
6. Williams' jerboa (<i>Allactaga williamsi</i>)		- Overgrazing, - Desertification	- Sustainable pasture management	Are very good PHD project.
Birds				
8. Eagles: Imperial eagle, White tailed eagle, Short toed eagle		- Disturbance	- Awareness raising	Monitor active nests. Need to be seen in the light of national monitoring context; National priority
9. Chukar partridge (<i>Alectoris chukar</i>)		- Poaching - Disturbances associated with grazing; - Field fires.	- Awareness raising	
10. Larks		- Indicator of steppe/semi-desert conditions	- Sustainable pasture management	
11. Lesser bastard	Around 40 000 individuals	- Indicator of steppe/semi-desert conditions		Park is Important as wintering site for this species. Suggested method/approach: monitoring should be carried out jointly with Azerbaijan
Reptiles and Amphibians				
9. Syrian Spadefoot (<i>Pelobates syriacus</i>)		- Health of freshwater ecosystem	-	Monitoring of tadpoles. Monitoring frequency - once in 5 years.
10. Reptile diversity		- Overall health of semi-arid ecosystem		
JAVAKHETI PROTECTED AREAS				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
Mammals				
1 Brandt's hamster (<i>Mesocricetus brandti</i>)		<ul style="list-style-type: none"> - Overgrazing - Disturbance 	<ul style="list-style-type: none"> - Reduce disturbance - Regulate livestock grazing 	<p>Easy to monitor by counting burrows.</p> <p>Javakheti plateau harbours the main population</p>
Birds				
2 White stork (<i>Ciconia ciconia</i>)		<ul style="list-style-type: none"> - Disturbance 	<ul style="list-style-type: none"> - Awareness raising 	<p>Suitable for educational monitoring</p> <p>Easy to monitor.</p>
TUSHETI PROTECTED AREAS & TUSHETI PROTECTED LANDSCAPE				
Mammals				
4. Chamois (<i>Rupicapra rupicapra</i>)		<ul style="list-style-type: none"> - Poaching 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism management; - Awareness raising 	<p>Difficult to monitor. However, adding the Chamois to the priority indicators would complete the large herbivore community monitoring throughout the Georgian east Greater Caucasus from Lagodekhi to Kazbegi.</p>
Birds				
2. Caucasian black grouse (<i>Lyrurus mlokosiewiczi</i>)		<ul style="list-style-type: none"> - Poaching - Disturbance incl. livestock grazing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve the management of livestock grazing - Awareness raising 	<p>Not practical for routine monitoring but a high priority for national level monitoring/habitat modelling.</p>
3. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		<ul style="list-style-type: none"> - Possibly poaching 		<p>Not practical for routine monitoring but a high priority for national level monitoring/habitat modelling.</p>

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
4. Gryphon vulture, Bearded vulture.		<ul style="list-style-type: none"> – Disturbance/persecution – Lack of food base 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	These species should be monitored at the national level.
PSHAV-KHEVSURETI PROTECTED AREAS				
Mammals				
1. Chamois (<i>Rupicapra rupicapra</i>)		<ul style="list-style-type: none"> – Poaching; – Disturbance 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	Relatively difficult to monitor. However, adding the Chamois to the priority indicators would complete the large herbivore community monitoring throughout the Georgian east Greater Caucasus from Lagodekhi to Kazbegi.
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		<ul style="list-style-type: none"> – Degradation of deciduous forest. (outcompeted by the red squirrel in mixed forest) 	Reduce pressure on forests and/or implement special forest conservation measures	
Birds				
3. Vulture (Griffon v., Bearded v.)		<ul style="list-style-type: none"> – Persecution; – Lack of food base 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	Need to be seen in the light of national monitoring context
4. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)		<ul style="list-style-type: none"> – Poaching – Grazing 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	Not practical for routine monitor High priority for national level monitoring/habitat modelling
5. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		<ul style="list-style-type: none"> – Poaching 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	Not practical for routine monitor

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
				High priority for national level monitoring/habitat modelling
LAGODEKHI PROTECTED AREAS				
Mammals				
1. Chamois (<i>Rupicapra rupicapra</i>)	149-319 individuals	<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists and sheep grazing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism management; - Improve pasture/grazing management; - Awareness raising 	<p>Suggested approach/method: Direct observations.</p> <p>Last assessment was carried out in 2014</p> <p>Relatively difficult to monitor. However, adding the Chamois to the priority indicators would complete the large herbivore community monitoring throughout the Georgian east Greater Caucasus from Lagodekhi to Kazbegi.</p>
2. Caucasian squirrel (<i>Sciurus anomalus</i>)		Degradation of deciduous forest. (outcompeted by the red squirrel in mixed forest)	Improve forest management practices as appropriate	Managed reserve only
3. European hare (<i>Lepus europaeus</i>)		<ul style="list-style-type: none"> - Hunting, - Overgrazing, - Dogs, etc. 	Improve sheep grazing practices and pasture management	Graze lands in the upstream Kabali gorge
Birds				
4. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)	Up to 700	<ul style="list-style-type: none"> - Poaching - Disturbance incl. from tourists and sheep grazing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism management. 	Difficult to monitor but a high priority for the national level monitoring/habitat modelling

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
				last assessment was carried out in 2003
5. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		Poaching	Strengthen law enforcement;	Not practical for routine monitor; A High priority for national level monitoring/habitat modelling. Suggested approach/method: presence data collection
Reptiles and Amphibians				
6. Caucasian parsley frog (<i>Pelodytes caucasicus</i>)		- Health of freshwater ecosystem	-	Monitoring of tadpoles. Monitoring frequency - once in 5 years.
KAZBEGI PROTECTED AREAS				
Mammals				
1. Chamois (<i>Rupicapra rupicapra</i>)	149-319 individuals	<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists and sheep grazing 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Improve tourism management; - Awareness raising 	<p>Suggested approach/method: Direct observations.</p> <p>Relatively difficult to monitor. However, adding the Chamois to the priority indicators would complete the large herbivore community monitoring throughout the Georgian east Greater Caucasus from Lagodekhi to Kazbegi.</p> <p>Last assessment was carried out in 2014</p>
Birds				
2. Caucasian Snowcock (<i>Tetraogallus caucasicus</i>)		- Poaching;		++ Not practical for routin monitor

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
				High priority for national level monitoring/habitat modelling
3. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)		<ul style="list-style-type: none"> - Poaching - Grazing 		NP has monitoring plan for this species
4. Golden eagle (<i>Aquila chrysaetos</i>)		<ul style="list-style-type: none"> - Persecution 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	
BORJOMI-KHARAGAULI NATIONAL PARK				
Mammals				
1. Roe deer (<i>Capreolus capreolus</i>)		<ul style="list-style-type: none"> - Poaching; - Disturbance incl. from tourists - Large infrastructure development 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Reduce/control human presence in certain areas/times 	Not a high priority but maybe easily combined with red deer monitoring.
2. Bats (<i>Chiroptera</i>)		<ul style="list-style-type: none"> - Indicator of forest condition 	Improve forest management / timber extraction practices	
3. Caucasian squirrel (<i>Sciurus anomalus</i>)		<ul style="list-style-type: none"> - Degradation of deciduous forest. (outcompeted by the red squirrel in mixed forest) 	Improve forest management / timber extraction practices	
4. European hare (<i>Lepus europaeus</i>)		<ul style="list-style-type: none"> - Hunting; - Overgrazing; - Dogs etc. 	Improve pasture management	Monitoring should be carried out on subalpine and alpine areas
Fishes				
5. Caucasian parsley frog (<i>Pelodytes caucasicus</i>)		<ul style="list-style-type: none"> - Health of freshwater ecosystem 	-	Monitoring of tadpoles. Monitoring frequency - once in 5 years.

6.3 Priority indicators for non-specific monitoring activities

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
ALGETI NATIONAL PARK				
Mammals				
1. Eurasian lynx (<i>Lynx lynx</i>)		<ul style="list-style-type: none"> – Poaching – Non-conservation friendly forestry – Depletion of food base (roe deer, hare, etc.). 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Reduce pressure on forests and/or implement special measures; – Awareness raising 	Suggested approach/method: general camera trapping.
MTIRALA NATIONAL PARK				
Mammals				
1. River otter (<i>Lutra lutra</i>)		<ul style="list-style-type: none"> – Persecution/Illegal killing 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	Lack of distribution data; Suggested method: presence monitoring
2. Eurasian lynx (<i>Lynx lynx</i>)		<ul style="list-style-type: none"> – Poaching – Non-conservation friendly forestry, – Depletion of food base (roe deer, hare, etc.) 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Reduce pressure on forests and/or implement special measures – Awareness raising 	Suggested method: general camera trapping
Reptiles and Amphibians				
5. <i>Pelodytes caucasicus</i>	Declining nationwide			Locations monitoring
KINTRISHI PROTECTED AREAS				
Mammals				

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
1. Eurasian lynx (<i>Lynx lynx</i>)		<ul style="list-style-type: none"> - Poaching - Non-conservation friendly forestry, - Depletion of food base (roe deer, hare, etc.) 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	Difficult to monitor. Suggested method: general camera trapping
2. River otter (<i>Lutra lutra</i>)		Persecution/Illegal killing	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	There is a lack of distribution data. Suggested approach/method: presence monitoring
MACHAKHELA PROTECTED AREAS				
Mammals				
1 Chamois (<i>Rupicapra rupicapra</i>)		Poaching	<ul style="list-style-type: none"> - Strengthen law enforcement; 	Suggested approach/method: presence monitoring, locations monitoring
VASHLOVANI PROTECTED AREAS				
N/A				
JVAKHETI PROTECTED AREAS				
Mammals				
1. Marbled polecat (<i>Vormella peregusna</i>)		<ul style="list-style-type: none"> - Poaching; - Disturbance from agricultural activities 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	Suggested approach/method: presence-absence data collection
2. River otter (<i>Lutra lutra</i>)		<ul style="list-style-type: none"> - Persecution 	<ul style="list-style-type: none"> - Strengthen law enforcement; - Awareness raising 	There is a lack of distribution data
TUSHETI PROTECTED AREAS & TUSHETI PROTECTED LANDSCAPE				
Mammals				
1. Leopard (<i>Panthera pardus</i>)		<ul style="list-style-type: none"> - Poaching; - Lack of pray base 	<ul style="list-style-type: none"> - Strengthen law enforcement; 	Suggested approach/method:

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
		– Disturbance	– Awareness raising	presence data collection
2. Eurasian lynx (<i>Lynx lynx</i>)		– Poaching; – Depletion of food base (roe deer, hare, etc.)	– Strengthen law enforcement; – Awareness raising	Suggested approach/method: presence data collection
PSHAV-KHEVSURETI PROTECTED AREAS				
Mammals				
1. Eurasian Lynx (<i>Lynx lynx</i>)		– Poaching; – Disturbance – Lack of prey base	– Strengthen law enforcement; – Awareness raising	Suggested approach/method: presence-absence data collection
Reptiles and amphibians				
5. <i>Darevka caucasica</i> , <i>D. rudis</i> , <i>D. rejugini</i>		– Persecution; – Intensive grazing		Suggested approach/method: presence-absence data collection incl. through web-based platforms.
6. Dinnick's Viper (<i>Vipera dinniki</i>)		– Persecution; – Intensive grazing		Suggested approach/method: presence-absence data collection incl. through web-based platforms.
LAGODEKHI PROTECTED AREAS				
N/A				
KAZBEGI PROTECTED AREAS				
Mammals				
1. Eurasian Lynx (<i>Lynx lynx</i>)		– Poaching; – Disturbance	– Strengthen law enforcement; – Awareness raising	Collect presence data

Indicator	Current status of indicator (trend, population size)	Direct threat/pressure affecting indicator; Relation to ecosystem/habitat health	Possible management response	Comment
BORJOMI-KHARAGAULI NATIONAL PARK				
Mammals				
1. Chamois (<i>Rupicapra rupicapra</i>)		<ul style="list-style-type: none"> – Poaching; – Disturbance incl. from tourists and sheep grazing – Large infrastructure development 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Improve tourism and grazing management. 	
2. Lynx (<i>Lynx lynx</i>)	8-15 individuals (Borjomi side only)	<ul style="list-style-type: none"> – Poaching; – Disturbance – Large infrastructure development 	<ul style="list-style-type: none"> – Strengthen law enforcement; 	<p>Last assessment was conducted in 2014</p> <p>Suggested approach/method: presence data collection.</p>
3. Otter (<i>Lutra lutra</i>)		<ul style="list-style-type: none"> – Poaching; – Disturbance – Large infrastructure development; – Depletion of food base/Illegal fishing; – Water pollution (in lake Tabatskuri) 	<ul style="list-style-type: none"> – Strengthen law enforcement; – Awareness raising 	<p>There is a lack of distribution data;</p> <p>Monitoring site: the Tabatskuri managed reserve</p> <p>Suggested approach: presence data collection.</p>

Annex 1 . Minutes of Key Expert Meetings

Topic/Objective:	<ul style="list-style-type: none"> - To review and agree on the selection criteria for fauna indicators - Birds / To critically review the bird indicators in the long list and revise them as needed;
Date:	17.07.2020
Mode:	Skype
Participant(s):	Natia Javakhishvili (SABUKO), Khatia Basilashvili (SABUKO), Christian Goenner (ZIM expert, Biodiversity & Forest Department, MEPA)
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented (i) the draft selection criteria for identifying priority indicators, (ii) the long list of indicators that was also shared with the experts in advance, and suggested to assign a priority rank to each indicator using the following simple ranking system:</p> <p style="padding-left: 40px;"><i>High priority</i>, indicated by +++ <i>Medium priority</i>, indicated by ++ <i>Low priority</i>, indicated by + <i>Not suitable/not occurring</i> on the given PA, indicated by ' - '</p> <p>The draft selection criteria for identifying priority indicators for protected areas were accepted without changes.</p> <p>Ch. Goenner noted that there was an upcoming process of revision of Georgia's red list, so the selection of priority indicators would need to take it into account that some changes were expected in the red listing. I. Shavgulidze noted that changes were mostly likely relate to specific threat categories while complete removal of a species from the list was highly unlikely; also this issue would be duly considered due to the fact that both the indicator selection and red list updating process would largely involve and rely on the same key experts.</p> <p>General comments on which all three experts agreed were as follows:</p> <ul style="list-style-type: none"> (i) Some of the bird species in the long list (hence in PA management plan, are unlikely to occur on given PAs or are probably rare, which makes them unsuitable indicator for biodiversity monitoring; (ii) While raptors are very important, their monitoring may not be appropriate or practical, among other things, due to their behavioural and ecological characteristics and the relatively small size of some PAs. Raptors are mostly best to be considered in the national monitoring schemes. However, raptor nest monitoring is a suitable indicator for some PAs or specific parts of PAs. <ul style="list-style-type: none"> - N. Javakhishvili suggested that larks are a very suitable and practical indicator of grasslands for example in Vashlovani PA. - Ch. Goenner suggested woodpeckers as a good indicator of forest health. - N. Javakhishvili added that forest bird index is also a very good indicator that can be used in many PAs. - The experts also noted the challenges associated with the monitoring of mountain birds such as Caucasian black grouse, Caucasian snowcock and Caspian snowcock. <p>The indicator long list was then reviewed in detail and revisions and additions were introduced as appropriate to be subsequently incorporated into the draft short list of fauna indicators.</p>	

Topic/Objective:	<ul style="list-style-type: none"> - To review and agree on the selection criteria for fauna indicators - Small mammals / To critically review the small mammal indicators in the long list and revise them as needed.
Date:	21.07.2020
Mode:	Physical meeting
Participant(s):	Alexandre Bukhnikashvili, Campester/Institute of Zoology Ioseb Natradze, Campester/Institute of Zoology
Facilitated by:	Irakli Shavgulidze

Key points and comments:	
<p>The facilitator presented (i) the draft selection criteria for identifying priority indicators, (ii) the long list of indicators that was also shared with the experts in advance, and suggested to assign a priority rank to each indicator using the following simple ranking system:</p> <p style="padding-left: 40px;"><i>High priority</i>, indicated by +++ <i>Medium priority</i>, indicated by ++ <i>Low priority</i>, indicated by + <i>Not suitable/not occurring</i> on the given PA, indicated by ' - '</p> <p>The draft selection criteria for identifying priority indicators for protected areas were accepted without changes. However, A. Bukhnikashvili noted that the criterion, <i>Indicators of threats to biodiversity (such as poaching, excessive grazing, pathogens, timber extraction, tourism, climate change, etc.)</i> was the most important one and should be given priority.</p> <p>General comments on which both experts agreed were as follows:</p> <ul style="list-style-type: none"> (i) A good indicator species is a relatively common animal; the presence of some of the small mammal species that are included in the long list, based on PA management plans, is questionable on given PAs or they are so rare that their monitoring is not feasible; (ii) In case of small mammals it is more appropriate to monitor them not as individual species but as a group of species such as forest dwelling bats. <p>The indicator long list was then reviewed in detail and revisions and additions were introduced as appropriate to be subsequently incorporated into the draft short list of fauna indicators. Those revisions in many cases involved the addition of the hare as an indicator of grassland health, Caucasian squirrel on the one hand and forest dwelling bats, on the other hand, as indicators of the health of forest ecosystems.</p>	

Topic/Objective:	<ul style="list-style-type: none"> - To review and agree on the selection criteria for fauna indicators - Large mammals / To critically review the large mammal indicators in the long list and revise them as needed.
Date:	25.07.2020
Mode:	Phone
Participant(s):	Zurab Gurielidze, Tbilisi Zoo/Ilia State University Bejan Lorkipanidze, NACRES
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented (i) the draft selection criteria for identifying priority indicators, (ii) the long list of indicators that was also shared with the experts in advance, and suggested to assign a priority rank to each indicator using the following simple ranking system:</p> <p style="padding-left: 40px;"><i>High priority</i>, indicated by +++ <i>Medium priority</i>, indicated by ++ <i>Low priority</i>, indicated by + <i>Not suitable/not occurring</i> on the given PA, indicated by ' - '</p> <p>The draft selection criteria for identifying priority indicators for protected areas were accepted without changes.</p> <p>General comments on which both experts agreed were as follows:</p> <ul style="list-style-type: none"> (i) While acknowledging the importance of some of the large mammal species, protected by the Bern convention, their monitoring on individual protected areas is not ecologically justified nor is it practical. This primarily condemns the wolf, whose monitoring should be conducted at the national level. (ii) It is important that, where appropriate, the same species are monitored throughout the PA system – in the case of bezoar goat and red deer such an approach would yield national-wide data, thus contributing to the national level monitoring, while also allow higher efficiency and better use of limited human and financial resources. 	

- (iii) Special emphasise was placed on the brown bear as a so called *umbrella species* and an indicator species for poaching/disturbance, a major threat to most protected areas. While the species occurs on most of the target PAs, its monitoring would contribute to the national-level biodiversity monitoring; The brown bear is also a priority Emerald species.

The indicator long list was then reviewed in detail and revisions and additions were introduced as appropriate to be subsequently incorporated into the draft short list of fauna indicators.

Topic/Objective:	- Flora, Habitats and Forest pathogens - To review and agree on the selection criteria for flora indicators
Date:	23.07.2020
Mode:	Physical meeting
Participant(s):	Kati Batsatsashvili, Ilia State University Davit Kikodze, Institute of Botany Niko Lachashvili, Institute of Botany Kosta Kerselidze, Institute of Botany Sandro Kolbaia, Tbilisi Botanical Garden
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented (i) the draft selection criteria for identifying priority indicators, (ii) the long list of indicators that was also shared with the experts in advance, and suggested to assign a priority rank to each indicator using the following simple ranking system:</p> <p style="padding-left: 40px;"><i>High priority</i>, indicated by +++ <i>Medium priority</i>, indicated by ++ <i>Low priority</i>, indicated by + <i>Not suitable/not occurring</i> on the given PA, indicated by ‘ - ’</p> <p>The experts noted that while the draft proposed technical criteria were focussed on individual species and were probably suitable for fauna, they were less relevant for flora species since specific flora species or specific habitat types were unlikely to serve as good indicators for biodiversity monitoring on protected areas. Thus an entirely different approach was proposed to identify flora biodiversity indicators, namely instead of focussing on individual species, to use the following wider classes or groupings: grasslands, forests and invasive plants.</p> <p>General comments were as follows:</p> <p>(i) In most cases, individual plant species, regardless their importance as endemic or rare, would not serve as good indicator for PA effective and adaptive management.</p> <p>(ii) For most PAs it is more suitable to monitor the condition of two major vegetation classes such as grasslands and forest as well as alien invasive plants, where applicable.</p> <p>(iii) Forest pathogens should be monitored in all PAs with substantial forest cover and significant threat from forest pests.</p> <p>N. Lachashvili noted that grasslands and forest monitoring should rely on permanent sample plots that should be assessed with a standardised protocol.</p> <p>K. Batsatsashvili noted the forest monitoring on PAs should be carried in compliance and full synergy with the national forest inventory (NFI).</p> <p>The indicator long list was then reviewed in detail and revisions and additions were introduced as appropriate to be subsequently incorporated into the draft short list of flora, habitats and forest pathogen indicators.</p>	

Topic/Objective:	- To review and agree on the short list of fauna indicators categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority
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	<p>indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities.</p> <p>- To review and agree on 2020 monitoring activities</p>
Date:	25.08.2020
Mode:	Skype
Participant(s):	Khatuna Tsiklauri, APA Bejan Lorkipanidze, NACRES
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented the short list of fauna indicators that was revised and updated after the validation Workshop held on 04.08.2020 and then categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities. He emphasised the need of further prioritising of the short list and explained the rational behind the above categorisation.</p> <p>Kh. Tsiklauri on the whole agreed on the short list of fauna indicators with one addition, the macroinvertebrates to be added to BKNP, namely for lake Tabastkuri.</p> <p>The facilitator proposed the following monitoring activities to be conducted already in 2020:</p> <ul style="list-style-type: none"> (i) Bezoar goat in Tsuheti and Pshav-Khevsureti PAs (ii) Red deer in Tusheti (range mapping and population size assessment to plan a detailed census in 2021 if appropriate) (iii) Red deer in Lagodekhi (to initiate a pallet decomposition rate experiment for subsequent census via pallet group counts) (iv) Alien invasive plants in Mtirala and Kintrishi. <p>Kh. Tsiuklauri agreed on the above proposal and reiterated that monitoring alien invasive plants is of critical importance for Mtirala and Kintrishi protected areas, especially in light of expected nomination of the Colchic forest as a UNESCO World Heritage Site in which both parks are fully incorporated.</p>	

Topic/Objective:	<p>- To review and agree on the short list of fauna indicators categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities.</p> <p>- To review and agree on 2020 monitoring activities</p>
Date:	26.08.2020
Mode:	Skype
Participant(s):	Salome Nozadze, Biodiversity & Forest Department, MEPA Christian Goenner, ZIM expert, Biodiversity & Forest Department, MEPA Bejan Lorkipanidze, NACRES Tamar Pataridze, CNF
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented the short list of fauna indicators that was revised and updated after the validation workshop held on 04.08.2020 and then categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities. He emphasised the need of further prioritisation of the short list and explained the rational behind the above categorisation.</p> <p>Ch. Goener noted that woodpeckers are indeed excellent indicators and it may also be possible that GIZ's current programme that is mainly focussed on forests may be interested to contribute to woodpecker monitoring. He also fully approved the presented short list of fauna indicators and suggested that this document should be adopted as an official "master plan" for biodiversity monitoring on protected areas as well incorporated into and serve as a basis for national biodiversity monitoring.</p>	

S. Nozadze noted that many Emerald species were not selected as indicators, whereas the country is obliged by the Bern convention to monitor all species included in Res. No. 6 of the Standing Committee. I. Shavgulidze responded that, while recognising its importance, the experts thought that many Emerald species could not be used as indicators for PA management effectiveness or PA adaptive management due to their ecology or current population status, and that they should be considered as important species *per se* for national biodiversity monitoring. Ch. Goener, suggested to prepare a separate document focussing on Emerald species since the presented short list was primarily of PA management relevance.

The facilitator proposed the following monitoring activities for the remainder of 2020:

- (i) Bezoar goat in Tsuheti and Pshav-Khevsureti PAs
- (ii) Red deer in Tusheti (range mapping and population size assessment to plan a detailed census in 2021 if appropriate)
- (iii) Red deer in Lagodekhi (to initiate a pallet decomposition rate experiment for subsequent census via pallet group counts)
- (iv) Alien invasive plants in Mtirala and Kintrishi.

The facilitator also asked if it would be still possible to carry out migratory bird monitor in Javakheti.

Meeting participants anonymously agreed on the above proposal. Ch. Goener explained that it was already too late to begin migratory bird counts in Javakheti and this activity had to be postpone till next autumn.

Topic/Objective:	<ul style="list-style-type: none"> - To review and agree on the short list of fauna indicators categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities. - To review and agree on 2020 monitoring activities
Date:	27.08.2020
Mode:	Physical meeting
Participant(s):	Toma Dekanoidze, Deputy Head of APA Bejan Lorkipanidze, NACRES Tamar Pataridze, CNF
Facilitated by:	Irakli Shavgulidze
Key points and comments:	
<p>The facilitator presented the short list of fauna indicators that was revised and updated after the validation workshop held on 04.08.2020 and then categorised as (i) high priority indicators for specific monitoring activities, (ii) medium priority indicators for specific monitoring activities and (iii) priority indicators for nonspecific monitoring activities. He emphasised the need of further prioritising of the short list and explained the rational behind the above categorisation.</p> <p>T. Dekanoidze overall approved the presented short list with one addition: to add ungulates – roe deer and chamois – as a high priority indicator to Mtirala, Kintrishi and Machakhela protected areas. I. Shavgulidze and B. Lorkipanidze agreed on this suggestion, explaining that camera trapping would be a suitable field technique for roe deer and chamois monitoring in those parks with the purpose to carry out index counts as opposed to population census.</p> <p>The facilitator proposed the following monitoring activities for the remainder of 2020:</p> <ul style="list-style-type: none"> (i) Bezoar goat in Tsuheti and Pshav-Khevsureti PAs (ii) Red deer in Tusheti (range mapping and population size assessment to plan a detailed census in 2021 if appropriate) (iii) Red deer in Lagodekhi (to initiate a pallet decomposition rate experiment for subsequent census via pallet group counts) (iv) Alien invasive plants in Mtirala and Kintrishi. <p>T. Dekanoidze agreed on the above proposal suggesting to add Mtirala, Kintrishi and Machakhela ungulate assessments to the list.</p>	

ANNEX 2: List of Consulted Key Stakeholders and Experts

Name of Expert	Name of Institution
Khatuna Tsiklauri	APA
Avto Mikaberidze	APA
Karlo Amirgulashvili	Biodiversity & Forest Department (MEPA)
Salome Nozadze	Biodiversity & Forest Department (MEPA)
Christian Goenner (ZIM expert)	Biodiversity & Forest Department (MEPA)
Papuna Kapanadze	Biodiversity & Forest Department (MEPA)
Vajha Kochiashvili	Biodiversity & Forest Department (MEPA)
Zura Javakhishvili	Ilia State University
Lexo Gavashelishvili	Ilia State University
Davit Tarkhnishvili	Ilia State University
Kati Batsatsashvili	Ilia State University
Bela Japoshvili	Ilia State University
Zura Gurielidze	Tbilisi Zoo/Ilia State University
Ioseb Natradze	Campester/Institute of Zoology
Alexandre Bukhnikashvili	Campester/Institute of Zoology
Natia Javakhishvili	SABUKO
Khatia Basilashvili	SABUKO
Davit Kikodze	Institute of Botany
Niko Lachashvili	Institute of Botany
Kosta Kereselidze	Institute of Botany
Zura Manvelidze	Batumi Botanical Gardens
Nino Memiadze	Batumi Botanical Gardens
Sandro Kolbaia	Tbilisi Botanical garden / NACRES
Eka Kakabadze	GFA, SPPA Georgia
Bejan Lorkipanidze	NACRES

ANNEX 3. Workshop on Fauna Indicators: Participants and Minutes

(A) List of Participants

Name of Expert	Name of Institution
Khatuna Tsiklauri	APA
Avtandil Mikaberidze	APA
Karlo Amirgulashvili	Biodiversity & Forest Department (MEPA)
Salome Nozadze	Biodiversity & Forest Department (MEPA)
Papuna Kapanadze	Biodiversity & Forest Department (MEPA)
Vajha Kochiashvili	Biodiversity & Forest Department (MEPA)
Zura Javakhishvili	Ilia State University
Davit Tarkhnishvili	Ilia State University
Zurab Gurielidze	Tbilisi Zoo/Ilia State University
Ioseb Natradze	Campester/Institute of Zoology
Alexandre Bukhnikashvili	Campester/Institute of Zoology
Eka Kakabadze	GFA, SPPA Georgia
Giorgi Arabuli	CNF
Tea Barbakadze	CNF
Tamar Partaridze	CNF
Irakli Goradze (via Skype)	UNDP
Bejan Lorkipanidze	NACRES
Nana Khelkhelauri	NACRES
Irakli Shavgulidze	NACRES

(B) Workshop Minutes

Topic/Objective:	<ul style="list-style-type: none">- To review and agree on the final short list of fauna indicators- To review and agree on final selection criteria
Date:	04.08.2020
Mode:	Physical
Facilitated by:	Irakli Shavgulidze
Agenda items:	Welcome – Carlo Amirgulashvili, MEPA Brief presentation of the CNF/UNDP/GEF Project – Tea Barbakadze, CNF; Tamar Pataridze, CNF. Workshop goals and objectives – Irakli Shavgulidze, NACRES Workshop agenda – Irakli Shavgulidze, NACRES Presentation of selection criteria and final validation – Irakli Shavgulidze, NACRES Fauna indicators by PAs – Irakli Shavgulidze, NACRES Discussion – all participants
Summary of results/discussion:	
<ul style="list-style-type: none">- While it is possible to consider the assessment of their population densities, reptiles are not suitable species as indicators, with the exception of Vashlovani PA where reptile community may be monitored in respect of species composition.- Woodpeckers are a good indicator of healthy forest community, so are forest dwelling bats.- Caucasian salamander is very sensitive to non-conservation friendly forestry activities but is not a good indicator of climate change; this species should be monitored every 5 years.- If possible, all three <i>Capra</i> species (bezoar goat, Esatcaucasian tur and chamois) of eastern Georgia should be monitored across the PAs of eastern Great Caucasus.- Brown bear monitoring on protected areas has a national significance, while wolf monitoring would be not relevant for PAs and should be considered as a priority for nation-wide monitoring.- Monitoring of certain raptor species (e.g. Egyptian vulture) would be not relevant for PAs and should be considered as a priority nation-wide monitoring; the same applies to mountain birds such as Caucasian black grouse, C. snowcock with some exceptions.- Species such as: Lesser bastard, Caucasian parsley frog (<i>Pelodytes caucasicus</i>), Velvet scoter (<i>Melanitta fusca</i>) were added to the list of indicators for applicable protected areas.	
Conclusions and next step(s):	
The presented list of indicators was reviewed for each of the target PA and comments and suggestions noted for subsequent revision of the document. With those additional amendments the short list was adopted by the workshop participants.	

Annex 4: Long List of Biodiversity Monitoring Indicators for Target PAs (based on PA management plans)

(A) Fauna

Table #1: Algeti NP

Indicator	Current sate of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Brown bear (<i>Ursus arctos</i>)		Poaching Disturbance	Improved law enforcement incl. control and preventing illegal hunting; Ensure sustainable visitor numbers.	
2. Roe deer (<i>Capreolus capreolus</i>)		Poaching Disturbance	Improved law enforcement incl. control and preventing illegal hunting; Ensure sustainable visitor numbers.	
3. Eurasian lynx (<i>Lynx lynx</i>)		Poaching Non-conservation friendly forestry	Improved law enforcement incl. control and preventing illegal hunting; Maintain old growth forest stands	
4. Egyptian vulture (<i>Neophron percnopterus</i>)		Persecution	Improved law enforcement; Organise “vulture restaurants” if appropriate; Develop birdwatching	
5. Forest and meadow ecosystems				
6. Caucasian grouse (<i>Lyrurus mlkosiewiczzi</i>)		Poaching	Improved law enforcement incl. control and prevention of illegal hunting.	
7. Forest pests				
8. Lesser spotted Eagle (<i>Aquila pomarina</i>)				
Priority Emerald species				
<i>Callimorpha quadripunctaria</i>				
<i>Canis lupus</i>				
<i>Rosalia alpina</i>				
<i>Ursus arctos</i>				
<i>Barbastella barbastellus</i>			Protect/maintain old-growth forest sections	
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				

Table #2: Mtirala NP

Indicator	Current sate of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Brown bear (<i>Ursus arctos</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
2. Chamois (<i>Rupicapra rupicapra</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
3. Roe deer (<i>Capreolus capreolus</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
4. River otter (<i>Lutra lutra</i>)		Persecution/Illegal killing	Improved law enforcement incl. control illegal fishing in the river.	
5. Eurasian lynx (<i>Lynx lynx</i>)		Poaching Non-conservation friendly forestry	Improved law enforcement incl. control and preventing illegal hunting; Maintain old growth forest stands	
6. Caucasian salamander (<i>Mertensiella caucasica</i>)		?	?	
7. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchicus</i> , etc.		?	Implement measures that are compatible with PA regulations and conservation objectives.	
8. Rhododendron				
9. Alien invasive plants		?	Implement measures to control/eradicate alien plants as appropriate	
10. Colchic forest		?	Restriction of visitor access to sensitive areas;	
11. Raptors		Poaching, illegal catching	Improved law enforcement incl. control and preventing illegal hunting;	
Priority Emerald species				
<i>Callimorpha quadripunctaria</i>		?		
<i>Canis lupus</i>		?		
<i>Rosalia alpina</i>		Sanitary cuts of infected/old trees	Maintain old beech trees.	
<i>Ursus arctos</i>		?		
<i>Barbastella barbastellus</i>		?		
<i>Lutra lutra</i>		?		
<i>Lynx lynx</i>		?		
<i>Myotis bechsteini</i>		?		
<i>Rhinolophus euryale</i>		Destruction of roosting sites	Protect roosting sites.	
<i>Vipera kaznakovi</i>		?		
<i>Lacerta clarkorum</i>		?		
<i>Myotis bechsteini</i>		Destruction of roosting sites	Protect roosting sites.	

Table #3: Kintrishi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Brown bear (<i>Ursus arctos</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
2. Eurasian lynx (<i>Lynx lynx</i>)		Poaching Non-conservation friendly forestry	Improved law enforcement incl. control and preventing of illegal hunting; Maintain old growth forest stands.	
3. Chamois (<i>Rupicapra rupicapra</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
4. River otter (<i>Lutra lutra</i>)		Persecution/Illegal killing	Improved law enforcement incl. control illegal fishing in the river.	
5. Caucasian salamander (<i>Mertensiella caucasica</i>)		?		
6. The brown river trout (<i>Salmo trutta</i>)		Illegal fishing;	Improved law enforcement incl. control and prevention of illegal fishing.	
7. Caucasian grouse (<i>Lyrurus mlokosiewiczii</i>)		Poaching	Improved law enforcement incl. control and prevention of illegal hunting.	
8. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchica</i> , etc.			Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	
9. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
10. Endemic trees and shrubs (<i>Betula medvedewii</i> , <i>Quercus pontica</i> , <i>Taxus baccata</i> , <i>Rhododendron ungeri</i>)		Illegal cutting; Pathogens.	Improved law enforcement incl. control of illegal cutting. Eco-education.	
11. <i>Alium adjaricum</i>		Excessive collection		Endemic
12. <i>Lilium szovitsianum</i>				
13. Cochic forest			Restriction of visitor access to sensitive areas;	
Priority Emerald species				
<i>Callimorpha quadripunctaria</i>				
<i>Canis lupus</i>				
<i>Rosalia alpina</i>		Sanitary cuts of infected/old trees	Maintain old beech trees.	
<i>Ursus arctos</i>				
<i>Barbastella barbastellus</i>				

<i>Lutra lutra</i>			
<i>Lynx lynx</i>			
<i>Rhinolophus euryale</i>		Destruction of roosting sites	Protect roosting sites.
<i>Vipera kaznakovi</i>			
<i>Myotis bechsteini</i>		Destruction of roosting sites	Protect roosting sites.

Table #4: Machakhela PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Brown bear (<i>Ursus arctos</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
2. Chamois (<i>Rupicapra rupicapra</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
3. River otter (<i>Lutra lutra</i>)		Persecution/Illegal killing	Improved law enforcement incl. control illegal fishing in the river.	
4. Caucasian salamander (<i>Mertensiella caucasica</i>)				
5. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchicus</i> , etc.			Implement measures that are compatible with PA regulations and conservation objectives.	
6. Rhododendron				
7. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
8. Colchic forest		Non-sustainable forestry activities	Ensure control of illegal cutting; Implement forest management; Restriction of visitor access to sensitive areas;	
9. Raptors		Poaching, illegal catching	Improved law enforcement incl. control and preventing illegal hunting;	
Priority Emerald species				
<i>Canis lupus</i>				
<i>Rosalia alpina</i>		Sanitary cuts of infected/old trees	Maintain old beech trees.	
<i>Ursus arctos</i>				
<i>Barbastella barbastellus</i>				
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				
<i>Vipera kaznakovi</i>				

Table #5: Vashlovani PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
7. Brown bear (<i>Ursus arctos</i>)	Extremely small population; Up 10 individuals.	Poaching	Improved law enforcement incl. control and preventing illegal hunting; Minimise conflict with local farmers.	
8. Persian gazelle (<i>Gazella subguturoza</i>)	Increasing	Poaching; Disturbances associated with livestock grazing and tourism.	Improved law enforcement incl. control and preventing illegal hunting; Ensure sustainable visitor numbers.	
9. Eurasian lynx (<i>Lynx lynx</i>)		Poaching; Depletion of food base (chukar, hare, etc.)	Improved law enforcement incl. control and preventing illegal hunting; Reintroductions of prey species ?	
10. Large birds of prey and vultures		Persecution, Pesticides	Improved law enforcement; Organise “vulture restaurants” if appropriate; Develop birdwatching	
11. Chukar partridge (<i>Alectoris chukar</i>)		Poaching Disturbances associated with grazing; Field fires.	Improved law enforcement incl. control and preventing illegal hunting;	
12. Pheasant (<i>Phasianus colchicus</i>)		Poaching; Disturbance associated with grazing; Field fires.	?	
13. Arid light woodlands	Decreasing	Illegal cutting for fuelwood; fire Grazing.	Improved law enforcement incl. control and preventing of illegal cutting	
14. Reptiles and amphibians				
15. Pests				
Priority Emerald species				
<i>Canis lupus</i>				
<i>Ursus arctos</i>				
<i>Gazella subguturoza</i>		Poaching; Disturbance associated with livestock grazing	Protect/maintain old-growth forest sections	
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				
<i>Panthera pardus</i>				

Rhinolophus mehelyi		Disturbance incl. from tourists	Protect roosting sites.	
Testudo graeca				

Table #6: Javakheti PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
Marbled polecat (<i>Vormella peregusna</i>)		Poaching; Disturbance from agricultural activities	Improved law enforcement; Sustainable grazing management	
River otter (<i>Lutra lutra</i>)		Persecution; Poaching.	Improved law enforcement incl. control of illegal fishing.	
Migratory water birds		Poaching	Improved law enforcement	
Nesting water birds		Illegal hunting	Improved law enforcement	
Nesting colonial water birds (Armenian gull, Dalmatian pelican, great white pelican)		Illegal hunting; Disturbance.	Improved law enforcement Establishment and management of breeding sites.	
White stork		Disturbance	Eco-education	
Crayfish and fish		Fishing, both legal and illegal	Improved law enforcement, Eradication of invasive species.	
Forest pests near Kartsakhi and Tetrobi MR				
Priority Emerald species				
<i>Canis lupus</i>				
<i>Lutra lutra</i>				
<i>Erebia medusa polaris</i>				
<i>Ligularia sibirica</i>		Habitat loss due to draining/climate change	Maintain small watercourses (e.g. by preventing draining) (Main threats:)	
<i>Lycaena dispar</i>				
<i>Meesia longiseta</i>		Habitat loss due to draining/climate change	Protect habitat (rich fens) e.g. by preventing draining	

Table #7. Tusheti PA and Tusheti PL

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
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7. Bezoar Goat (<i>Capra aegagrus</i>)	About 310 individuals	Poaching; Disturbance	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2013
8. East Caucasian tur (<i>Capra cylindricornis</i>)	About 1500 individuals	Poaching; Disturbance	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2014
9. Red deer (<i>Cervus elaphus</i>)		Poaching; Disturbance	Improved law enforcement incl. control and prevention of illegal hunting.	
10. Chamois (<i>Rupicapra rupicapra</i>)		Poaching	Improved law enforcement incl. control and preventing illegal hunting;	
11. Leopard (<i>Panthera pardus</i>)		Poaching; Lack of pray base Disturbance	Improved law enforcement incl. control and prevention of illegal hunting. Introduction of prey species?	
12. Eurasian lynx (<i>Lynx lynx</i>)		Poaching; Depletion of food base (chukar, hare, etc.)	Improved law enforcement incl. control and preventing illegal hunting; Reintroductions of prey species ?	
13. Forest pests				
14. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)		Poaching Grazing	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
15. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		Poaching	Improved law enforcement incl. control and prevention of illegal hunting.	
16. Forest habitats				
17. Pastures		Overgrazing; Climate change.	Sustainable pasture management	
Priority Emerald species				
<i>Callimorpha quadripunctaria</i>				
<i>Canis lupus</i>				
<i>Ursus arctos</i>				
<i>Capra aegagrus</i>				
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				
<i>Panthera pardus</i>				

Table #8. Pshav-Khevsureti PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
4. Bezoar Goat (<i>Capra aegagrus</i>)	About 50 individuals	Poaching; Disturbance Tourism	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2013
5. Eastcaucasian tur (<i>Capra cylindricornis</i>)	70-143 individuals	Poaching; Disturbance	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2014
6. Chamois (<i>Rupicapra rupicapra</i>)		Poaching; Disturbance	Improved law enforcement incl. control and prevention of illegal hunting.	
7. Eurasian Lynx (<i>Lynx lynx</i>)		Poaching; Disturbance Lack of prey base	Improved law enforcement incl. control and prevention of illegal hunting. Reintroduction of prey species	
8. Bearded vulture (<i>Gypaetus barbatus</i>)		Persecution	Improved eco-education	
9. Egyptian Vulture (<i>Neophron percnopterus</i>)		Persecution, Poisoning (?)	Improved eco-education	
10. Caucasian grouse (<i>Lyrurus mlkosiewiczi</i>)		<ul style="list-style-type: none"> • Poaching • Grazing 	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
11. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		Poaching	Improved law enforcement incl. control and prevention of illegal hunting.	
12. <i>Darevka caucasica</i> , <i>D. rudis</i> , <i>D. rejugini</i>				
13. Dinnick's Viper (<i>Vipera dinniki</i>)		<ul style="list-style-type: none"> • Persecution; • Intensive grazing 	Targeted eco-education;	
14. The brown river trout (<i>Salmo trutta</i>)		Illegal fishing;	Improved law enforcement incl. control and prevention of illegal fishing.	
15. Forest (exploited and burned plots, intact plots)				
16. Rock, scree and wet areas vegetation				
17. Red list wooded plants (<i>Quercus macranthera</i> , <i>Betula raddeana</i> , <i>Ulmus glabra</i> , <i>Sorbus hajastana</i>)		Illegal cutting	Improved law enforcement	
18. <i>Primula darialica</i>		Climate change		
19. <i>Symphyloloma graveolens</i>		Climate change		
Priority Emerald species				

<i>Canis lupus</i>				
<i>Ursus arctos</i>				
<i>Capra aegagrus</i>				
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				
<i>Panthera pardus</i>				
<i>Vipera kaznakovi</i>				

Table #9 Lagodekhi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
4. Red deer (<i>Cervus elaphus</i>)	Minimum 74 individuals	<ul style="list-style-type: none"> Poaching; Disturbance incl. from tourists 	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment was carried out in 2018
5. Eastcaucasian tur (<i>Capra cylindricornis</i>)	Minimum 505 individuals	<ul style="list-style-type: none"> Poaching; Disturbance incl. from tourists 	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment was carried out in 2019
6. Brown bear (<i>Ursus arctos</i>)		<ul style="list-style-type: none"> Poaching; Disturbance incl. from tourists 	Improved law enforcement incl. control and prevention of illegal hunting.	
7. Chamois (<i>Rupicapra rupicapra</i>)	149-319 individuals	<ul style="list-style-type: none"> Poaching; Disturbance incl. from tourists and sheep grazing 	Improved law enforcement incl. control and prevention of illegal hunting;	The assessment was carried out in 2014
8. Caucasian grouse (<i>Lyrurus mlokosiewiczi</i>)	Up to 700	<ul style="list-style-type: none"> Poaching Disturbance incl. from tourists and sheep grazing 	Improved law enforcement incl. control and prevention of illegal hunting;	The assessment carried out in 2003
9. Caucasian snowcock (<i>Tetraogallus caucasicus</i>)		Poaching	Improved law enforcement incl. control and prevention of illegal hunting.	
10. Monitoring of sensitive and vulnerable habitats		Climate change		
11. Pastures		Overgrazing	Special grazing regimes/restrictions.	

12. Invasive species			Implement measures to control/eradicate alien plants as appropriate	
Priority Emerald species				
Callimorpha quadripunctaria				
Canis lupus				
Rosalia alpina				
Ursus arctos				
Barbastella barbastellus				
Lynx lynx				

Table # 10 Kazbegi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
Eastcaucasian tur (<i>Capra cylindricornis</i>)	About 800 individuals	<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists and sheep grazing 	Improved law enforcement incl. control and prevention of illegal hunting;	The assessment was carried out in 2014
Chamois (<i>Rupicapra rupicapra</i>)	149-319 individuals	<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists and sheep grazing 	Improved law enforcement incl. control and prevention of illegal hunting;	The assessment was carried out in 2014
Eurasian Lynx (<i>Lynx lynx</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance 	Improved law enforcement incl. control and prevention of illegal hunting;	
Brown Bear (<i>Ursus arctos</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance 	Improved law enforcement incl. control and prevention of illegal hunting;	
Long clawed mole vole (<i>Prometheomys schaposchnikovi</i>)				
Kazbeg birch mouse (<i>Sicista kazbegica</i>)				
Caucasian Snowcock (<i>Tetraogallus caucasicus</i>)		<ul style="list-style-type: none"> • Poaching; 	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
Caucasian grouse (<i>Lyrurus mlkosiewiczzi</i>)		<ul style="list-style-type: none"> • Poaching • Grazing 	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
Bearded vulture (<i>Gypaetus barbatus</i>)		Persecution	Improved eco-education	

Egyptian Vulture (<i>Neophron percnopterus</i>)		Persecution	Improved eco-education	
Eurasian griffon (<i>Gyps fulvus</i>)		Persecution Helicopter flights Tourism (such as recreational infrastructure incl. a zipline and operation)	Improved eco-education	
Golden eagle (<i>Aquila chrysaetos</i>)		Persecution	Improved eco-education	
Great rosefinch (<i>Carpodacus rubicilla</i>)		Habitat destruction		
Guldenstadt's Redstart (<i>Phoenicurus erythrogastrus</i>)		Habitat destruction		
Great Rosefinch (<i>Carpodacus rubicilla</i>)				
Dinnick's viper (<i>Vipera dinniki</i>)		<ul style="list-style-type: none"> • Persecution • Overgrazing 		
<i>Arabis kazbegi</i>				Narrow local endemic
<i>Campanula belidifolia</i>				Narrow local endemic
<i>Ranunculus baidarae</i>				Narrow local endemic
<i>Delphinium caucasicum</i>		<ul style="list-style-type: none"> • Overgrazing • Climate change 		Narrow local endemic.
<i>Primula darialica</i>				Narrow local endemic
<i>Ranunculus lojkae</i>		<ul style="list-style-type: none"> • Overgrazing • Climate change 		Narrow local endemic
<i>Cladochaeta candidissima</i>				Caucasian endemic genus.
Forest pests				
Priority Emerald species				
<i>Canis lupus</i>				
<i>Ursus arctos</i>				
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				

Table #11. BKNP

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
9. Forest features (burned areas, treeline, large windblown trees)				
10. Forest pests				
11. Invasive species				
12. Red deer (<i>Cervus elaphus</i>)	300-500 individuals	<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists • Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting.	
13. Chamois (<i>Rupicapra rupicapra</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists and sheep grazing • Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting.	
14. Roe deer (<i>Capreolus capreolus</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists • Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2015
15. Brown bear (<i>Ursus arctos</i>)	38-47 individuals	<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2014
16. Wolf (<i>Canis lupus</i>)		<ul style="list-style-type: none"> • Poaching/Persecution • Disturbance incl. from tourists • Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting; Eco-education;	
17. Lynx (<i>Lynx lynx</i>)	8-15 individuals (Borjomi side only)	<ul style="list-style-type: none"> • Poaching; • Disturbance • Large infrastructure development 	Improved law enforcement incl. control and prevention of illegal hunting.	The assessment carried out in 2014

18. Otter (<i>Lutra lutra</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance • Large infrastructure development; • Depletion of food base/Illegal fishing; • Water pollution (in lake Tabatskuri) 	Improved law enforcement incl. control and prevention of illegal hunting and fishing; Eco-education;	
19. Caspian Snowcock (<i>Tetrao gallus caspius</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists and sheep grazing 	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
20. Caucasian grouse (<i>Lyrurus mlokosiewiczii</i>)		<ul style="list-style-type: none"> • Poaching; • Disturbance incl. from tourists and sheep grazing. 	Improved law enforcement incl. control and prevention of illegal hunting. Special grazing regimes/restrictions.	
21. Water birds		<ul style="list-style-type: none"> • Poaching; • Collecting bird eggs; • Unsustainable mowing 	Improved law enforcement incl. control and prevention of illegal hunting. Mowing regimes/restrictions.	Ktsia-Tabatskuri Lake
22. <i>Galanthus spp.</i>		<ul style="list-style-type: none"> • Illegal grazing in forest; • Climate change 	Improved law enforcement i.e. control of illegal grazing in forest	
Priority Emerald species				
<i>Callimorpha quadripunctaria</i>				
<i>Canis lupus</i>				
<i>Rosalia alpina</i>				
<i>Ursus arctos</i>				
<i>Barbastella barbastellus</i>				
<i>Lutra lutra</i>				
<i>Lynx lynx</i>				
<i>Rhinolophus euryale</i>				
<i>Vipera kaznakovi</i>				

(B) Flora species, Habitats and Forests Pests

Table #1: Algeti NP

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest and meadow ecosystems				

Table #2: Mtirala NP

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchicus</i> , etc.		?	Implement measures that are compatible with PA regulations and conservation objectives.	
2. Rhododendron				
3. Alien invasive plants		?	Implement measures to control/eradicate alien plants as appropriate	
4. Colchic forest		?	Restriction of visitor access to sensitive areas;	

Table #3: Kintrishi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchica</i> , etc.			Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	
2. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
3. Endemic trees and shrubs (<i>Betula medvedewii</i> , <i>Quercus pontica</i> , <i>Taxus baccata</i> , <i>Rhododendron ungeri</i>)		Illegal cutting; Pathogens.	Improved law enforcement incl. control of illegal cutting. Eco-education.	
4. <i>Alium adjaricum</i>		Excessive collection		Endemic
5. <i>Lillium szovitsianum</i>				
6. Cochic forest			Restriction of visitor access to sensitive areas;	

Table #4: Machakhela PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest species affected by pathogens <i>Castanea sativa</i> , <i>Buxus colchicus</i> , etc.			Implement measures that are compatible with PA regulations and conservation objectives.	
2. Rhododendron				
3. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
4. Colchic forest		Non-sustainable forestry activities	Ensure control of illegal cutting; Implement forest management; Restriction of visitor access to sensitive areas;	

Table #5: Vashlovani PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Arid light woodlands	Decreasing	Illegal cutting for fuelwood; fire Grazing.	Improved law enforcement incl. control and preventing of illegal cutting	

Table #6: Javakheti PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
Forest pests near Kartsakhi and Tetrobi MR				

Table #7. Tusheti PA and Tusheti PL

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest pests				

2. Forest habitats			
3. Pastures		Overgrazing; Climate change.	Sustainable pasture management

Table #8. Pshav-Khevsureti PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. <i>Darevkia caucasica</i> , <i>D. rudis</i> , <i>D. rejugini</i>				
2. Forest (exploited and burned plots, intact plots)				
3. Rock, scree and wet areas vegetation				
4. Red list wooded plants (<i>Quercus macranthera</i> , <i>Betula raddeana</i> , <i>Ulmus glabra</i> , <i>Sorbus hajastana</i>)		Illegal cutting	Improved law enforcement	
5. <i>Primula darialica</i>		Climate change		
6. <i>Symphyloloma graveolens</i>		Climate change		

Table #9 Lagodekhi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Monitoring of sensitive and vulnerable habitats		Climate change		
2. Pastures		Overgrazing	Special grazing regimes/restrictions.	
3. Invasive species			Implement measures to control/eradicate alien plants as appropriate	

Table # 10 Kazbegi PA

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. <i>Arabis kazbegi</i>				Narrow local endemic
2. <i>Campanula belidifolia</i>				Narrow local endemic

3. <i>Ranunculus baidarae</i>				Narrow local endemic
4. <i>Delphinium caucasicum</i>		<ul style="list-style-type: none"> • Overgrazing • Climate change 		Narrow local endemic.
5. <i>Primula darialica</i>				Narrow local endemic
6. <i>Ranunculus lojkae</i>		<ul style="list-style-type: none"> • Overgrazing • Climate change 		Narrow local endemic
7. <i>Cladochaeta candidissima</i>				Caucasian endemic genus.
8. Forest pests				

Table #11. BKNP

Indicator	Current state of indicator (assessed or estimated)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Forest features (burned areas, treeline, large windblown trees)				
2. Forest pests				
3. Invasive species				
4. <i>Galanthus spp.</i>		<ul style="list-style-type: none"> • Illegal grazing in forest; • Climate change 	Improved law enforcement i.e. control of illegal grazing in forest	

ANNEX 5. Criteria for Selecting Fauna Indicators for Biodiversity Monitoring on Target PAs

I. Scientific and conservation criteria:

- Indicators (i.e. fauna species) identified in the management plans of the target PAs.
- Indicators of threats and pressures on PAs such as poaching, excessive grazing, pathogens, forest use/timber extraction, tourism, climate change, etc.
- National significance – species listed in the national Red List or having an outstanding economical or social significance, etc.
- International and regional significance – species listed in resolution No.6 of the Standing Committee of the Bern Convention (so called Emerald species).
- Indicators of the National Biodiversity Monitoring System

II. Management criteria:

- Practicality – *How effectively can monitoring results be translated into the management of the given PA?*
- Cost-effectiveness – *What are the available methods (those that can yield credible results) and how accessible and cost-effective are they?*
- Feasibility – *Do/will we have sufficient human and financial resources necessary to implement the indicator?*

ANNEX 6. Draft Short List of Indicators: Flora, Habitats, Forest Pathogens

Indicator	Current status of indicator (if available)	Direct threat/pressure affecting indicator	Possible management response	Comment
Algeti NP				
1. Forests		- Timber/fuelwood extraction		
2. Meadows		- Grazing	- Strengthen law enforcement; - Ensure sustainable grazing	Suggested method: permanent sample plots.
Mtirala NP				
1. Colchic forest			- Reduce pressure on forests and/or implement special measures; - Awareness activities.	Suggested method: permanent sample plots.
2. Forest pathogens			Implement measures that are compatible with PA regulations and conservation objectives.	
3. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
Kintrishi Protected Areas				
1. Colchic forest			- Reduce pressure on forests and/or implement special measures; - Awareness activities.	Suggested method: permanent sample plots.
2. Pontic oak (<i>Quercus pontica</i>)		Illegal felling.		Important rare endemic
3. Forest pathogens			Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	
4. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
Machakhela Protected Areas				

Indicator	Current status of indicator (if available)	Direct threat/pressure affecting indicator	Possible management response	Comment
1. Colchic forest			<ul style="list-style-type: none"> - Reduce pressure on forests and/or implement special measures; - Awareness activities. 	Suggested method: permanent sample plots.
2. Forest pathogens			Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	
3. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
Vashlovani Protected Areas				
1. Arid light woodlands	Decreasing	Illegal cutting for fuelwood; fire Grazing.	Improved law enforcement incl. control and preventing of illegal cutting	Suggested method: permanent sample plots.
2. Grasslands		Grazing	<ul style="list-style-type: none"> - Strengthen law enforcement; - Ensure sustainable grazing 	Suggested method: permanent sample plots.
3. Deciduous forest on Shavi Mta		Illegal cutting for fuelwood and timber.	Improved law enforcement incl. control and preventing of illegal cutting	Suggested method: permanent sample plots.
Javakheti Protected Areas				
Wetland vegetation		<ul style="list-style-type: none"> - Grazing - Drainage 	<ul style="list-style-type: none"> - Control grazing; - Restore hydrological regime. 	Suggested method: permanent sample plots.
Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
Tusheti Protected Areas PA and Tusheti Protected Landscape				
18. Pine and deciduous forests		<ul style="list-style-type: none"> - Timber extraction - Grazing 	<ul style="list-style-type: none"> - Reduce pressure on forests and/or implement special measures; - Awareness activities. 	Suggested method: permanent sample plots.

Indicator	Current status of indicator (if available)	Direct threat/pressure affecting indicator	Possible management response	Comment
19. High mountain meadows		- Grazing; - Climate change.	Sustainable pasture management	Suggested method: permanent sample plots.
20. Forest pathogens			Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	
Pshav-Khevsureti Protected Areas				
1. Forest		- Timber extraction - Grazing	- Reduce pressure on forests and/or implement special measures; - Awareness activities.	Suggested method: permanent sample plots.
2. High mountain meadows		- Grazing; - Climate change.	Sustainable pasture management	Suggested method: permanent sample plots.
Lagodekhi Protected Areas				
1. Forest in Managed Reserve		- Timber extraction	- Reduce pressure on forests and/or implement special measures;	Suggested method: permanent sample plots.
2. Meadows in upstream Kabali		- Grazing; - Climate change.	Sustainable pasture management	Suggested method: permanent sample plots.
3. Alien invasive plants			Implement measures to control/eradicate alien plants as appropriate	
Kazbegi Protected Areas				
1. Forest		- Timber extraction	- Reduce pressure on forests and/or implement special measures;	Suggested method: permanent sample plots.
2. High mountain meadows		- Grazing; - Climate change.	Sustainable pasture management	Suggested method:

Indicator	Current status of indicator (if available)	Direct threat/pressure affecting indicator	Possible management response	Comment
				permanent sample plots.
Borjomi-Kharagauli National Park				
1. Forest		- Timber extraction	- Reduce pressure on forests and/or implement special measures;	Suggested method: permanent sample plots.
2. Meadows		- Grazing; - Climate change.	Sustainable pasture management	Suggested method: permanent sample plots.
3. Forest pathogens		-	Implement measures against forests pests that are compatible with PA regulations and conservation objectives.	

