Kaktong Key Biodiversity Area Conservation Action Plan 1st July 2023 – 30th June 2033.

Divisional Forest Office, Zhemgang
Department of Forests and Park Services
Ministry of Energy and Natural Resources

Royal Government Endorsement and Approval

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"In accordance with and as per the provisions of the Forest and Nature Conservation Act of Bhutan, 1995"

Submitted for Approval

Chief Forestry Officer
Zhemgang Forest Division.

Forwarded for Approval

Chief Forestry Officer
Nature Conservation Division

Approved by

DIRECTOR
Department of Forests and Park Services

FOREWORD

Bhutan's rich biodiversity has been secured by the network of protected areas for the past many decades. However, the state of forests and biodiversity are equally rich beyond the protected areas in Bhutan. On the contrary, the areas beyond protected areas faces considerable threats from anthropogenic disturbances and economic development, and this poses risk to many globally threatened habitats and species found therein. Across the globe, such areas of conservation significance have been addressed by the "other effective area-based conservation measures" or OECMs, an area set aside towards achieving the long term and effective in-situ conservation of biodiversity outside of protected areas. OECMs complement protected areas through sustained, positive conservation outcomes, even though they may be managed primarily for other reasons.

The Key Biodiversity Areas (KBA) in Bhutan, at a global scale is part of the OECMs and is, therefore, adopted towards securing conservation of areas and species that are of conservation significance in Bhutan. Of the many potential KBA sites in the country, the Department has identified and prioritized 11 sites in various Divisional Forest Offices, that requires urgent conservation interventions. For these 11 sites, key interventions have been identified, and has been and is being presented in this conservation action plan as per the guidelines on KBA. The KBA sites classified will serve as in-situ conservation of biodiversity beyond the protected areas.

These classified KBAs are expected to bring in improved conservation outcomes, that are crucial for the functioning of the environment through the provision of essential ecosystem services. It is essential for the processes that support all life on Earth, including humans. These KBAs are expected to address the issues of biodiversity loss and ecosystem degradation due to threats such as pollution, overexploitation of natural resources, introduction of invasive species and habitat loss.

I am happy to note that we continue to prioritize conserving our natural resources, while balancing ourselves with the need to economically develop the nation. I applaud all concerned officials from the Department for coming up with this conservation action for the first set of KBAs classified in the country and wish you all success in implementing the actions.

(Lobzang Dorji)
Director

Acronyms and abbreviations

KBA	Key Biodiversity Area
NCD	Nature Conservation Division
CF	Community Forest
Nu	Ngultrum
NWFPs	Non-wood Forest Products
PH	Prime Habitat
SD4C	Social Development for Conservation
SMART	Spatial Monitoring and Reporting Tool
WWF	World Wide Fund for Nature

Table of Content

Chapter 1: Introduction.

Key Biodiversity Area (KBA) is a site that contributes significantly to the global persistence of biodiversity. In context of Bhutan, KBA are sites outside protected areas that significantly contribute towards national persistence of biodiversity (NCD, 2020). The current key biodiversity area is proposed for protection and conservation of threatened and rare orchid species which includes critically endangered *Paphiopedilum fairrieanum*, endangered *Paphiopedilum venustum, Paphiopedilum insigne, and newly discovered Paphiopedilum pradhanii and Spathoglottis jetsuniae.* These orchids are currently thriving together only in proposed site and protection of such critical habitat is desired to maintain viable population (NCD, 2021). The KBA is triggered by the KBA Criterion A1 as per the guideline for using a global standard for the identification of BKAs, Ver.1.1.

The KBA site is situated between 26056'24.8" N and 90059'37.3" E with an elevation ranging from 789-1204masl. The current KBA site is located at Kaktong & Ngangla Trong Chiwogs under Ngangla Gewog in Territorial Forest Division, Zhemgang whereby Division plays an important role in sustaining biodiversity at a greater landscape level due to its strategic locations and its connectivity among the protected areas by biological corridor. The total proposed area of the KBA site is 0.25 square kilometer. Majority of the forest cover in KBA sites are intact with less developmental activities. However, with upcoming developmental activities and increasing anthropogenic activities in the KBA sites may cause pressure on forest and its resources.

The site is covered with 60% forest, 30% rocky and inaccessible areas and 10% with shrubs and undergrowth. The major forest types found in the KBA site is warm broadleaf forest with slope gradient from moderate to steep slope. The species mainly prefer to grow on rocky, gentle slope, steep slopes and limestone areas. The dominant trees found in these proposed KBA site are *Phoebe lanceolata* and *Cinnamomum* sp. A dense undergrowth of *Piper longum, Piper pedicellatum, Ardisia* sp., Yula and bamboo are found growing in the area.

Local communities of two chiwogs (Ngangla Trong & Kaktong) residing in the periphery of the KBA site are dependent on the natural resources such as collection of Non-wood Forest Products (NWFPs), firewood, timber, and cattle grazing. The water source which usually dries in winter and come up in the summer is also present at the site. The footpath connecting these two chiwogs pass through the KBA site. Though the presence of orchids in the area is pride for community around the KBA site, people are unaware about the status of orchids in the world and also in Bhutan. So, most of the orchids are threatened by ongoing

developmental activities such as road construction, human intrusion and climate change which may cause depletion of the population.

It is very imperative to protect such type of very rare and critical habitats to ensure the persistence of the species. Protection of such habitats can be achieved through declaration of the sites as key biodiversity area with proper conservation action plan. The current KBA action plan is for the period of ten years and there are two objectives with five strategies and 19 actions to meet the goal for protecting this critical habitat and species.

Chapter 2: Threat and Challenges.

Threat assessment and analysis are integral to conservation action planning and management for any protected area or species. Threat analysis encompasses determining the type of threats, the severity of the threats, and the drivers of the threats. Threats impeding the survival of the threatened orchid species were gathered based on the KBA site assessment survey conducted in December 2021 and additional validation survey conducted in November 2022 and field knowledge of the forestry staff. Based on this information, threat analyses were conducted using Miradi-4.5.0. As a result, we were able to identify and assess six significant threats which hamper the conservation and protection of these orchid species, which were alerted by ten major contributors (Figure 1). In addition, threats were assessed to derive relevant strategies and intervention actions for better protection and conservation of the species and also to enhance community livelihood of the vicinity villages. Details of each threat are discussed in the subsequent sections.

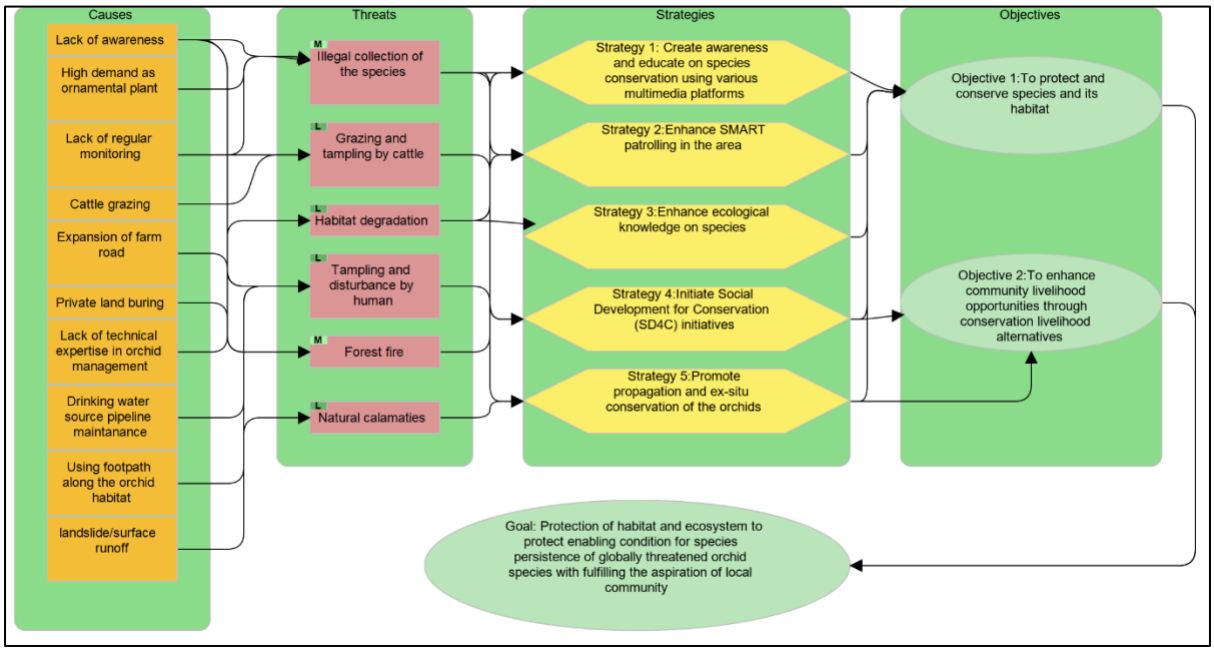

Figure 1. Threat analysis framework

Threats and challenges

1. *Illegal collection of species*

Collection of wild orchids as ornamental plant are increasing in Bhutan and the trend is also similar in the current KBA site. *Paphiopedilum* species are rare to find and demand for such species as ornamental has increased in the locality. In year 2022, the forestry team recovered 165 species of *Paphiopedilum fairrieanum* and *Paphiopedilum venustum* plants from around 50 households in the current location, which were collected from the current site as ornamental purposes. These orchid species are also seen in the apartments of residents in Panbang and Zhemgang and several numbers are also reached to apartments in Thimphu.

Figure 2. Illegal collection of orchids by local communities

2. *Grazing and trampling by local cattle*

Two communities of Kaktong and Ngangla-Trong graze their cattle in the KBA site and its proximity area. Cattle are left to graze freely during the day time in the area and are collected in the evening at home. Grazing of the ground bushes will lead to damage and exposure of the orchid seedlings to external extremes. Orchids are located on the very loose soil slopes and trampling by the cattle will uproot the plant and may also damage the plant. Unregulated cattle grazing in the area may lead to habitat degradation and affect the orchid population.

3. *Habitat degradation*

Habitat degradation is a great cause of concern for the future survival and existence of these orchid species. Habitat degradations are contributed by collection of natural resources like firewood, NWFPs and fencing poles from the KBA site. The site is located in between the farm roads and the future expansion of these roads may lead to fragmentation of the existing habitat. Management of such critical orchid habitat required high-end technical expertise which is currently lacking with the field foresters. The devoid of such expertise in the field may not help to prevent habitat degradation.

Figure 3. Farm road in proximity to the KBA site

4. Trampling and disturbance by human

The walking trail from Ngangla-Trong to Kaktong passes through the KBA and good population of these orchids are located alongside of this trail. These individuals are exposed to trampling and damage by the passer-by. Moreover, the drinking water source and its supply pipeline is also within the KBA. During regular maintenance and improvement of their water supply, there are high risk of trampling and damage to the species. Therefore, it is critical to manage the trail with proper trail utility plan and if possible, change the drinking water source of Kaktong communities.

Figure 4. Communities using the trail along the KBA site

5. Forest fire

Western and Northern side of the KBA is surrounded by private registered lands and communities in the locality burn the agriculture regularly for cultivation. The orchid species are surviving along the steep slope with grasses and if the fire gets in this area during private land burning, it will have devastating impact on survival and population of these species.

6. Natural calamities

Although there are no proper evidences on impact of natural calamities on these orchid species, it is foreseen that the area being on the moderate to steep slope with minimal surface vegetation, there are risk of landslide and severe surface run off which will in turn threaten the survival of the orchid species.

Figure 5. Exposed surface landscape inside KBA site

Threat ranking

The conservation threat ranking was performed using the Miradi software, considering three primary criteria for ranking. These criteria include *1. Scope, 2. Severity, and 3. Irreversibility*. Scope refers to the proportion of the threat likely to affect the target within ten years under current circumstances. Severity is the level of damage to the biodiversity target expected within the scope, the level of damage to the target from the threat that can reasonably be expected given the continuation of current circumstances and trends. Irreversibility is the degree to which the effects of a given threat can be undone and the targets affected by the threat restored if the threat is stopped. Four sub-level criteria guide the nature of each threat ranking criteria: **1: Low** (The threat is likely to be very narrow in its scope, affecting the target across a small proportion (1-10%) of its occurrence/population), **2: Medium** (The threat is likely to be restricted in its scope, affecting the target across some (11– 30%) of its occurrence/population), **3: High:** The threat is likely to be widespread in its scope, affecting the target across much (31– 70%) of its occurrence/population), **4: Very High** The threat is likely to be pervasive in its scope, affecting the target across all or most (71-100%) of its occurrence/population.

The overall threat ranking for this KBA site is high within the six major threats identified. It is contributed by illegal collection of the species from the site with all criteria (scope, severity and irreversibility) scoring **high** and forest fire with score of **high** (Scope: low, Severity: High, Irreversibility: very high). Trampling and disturbance by human and grazing and trampling by cattle ranked **medium** and the rest two are with low score (Figure 6).

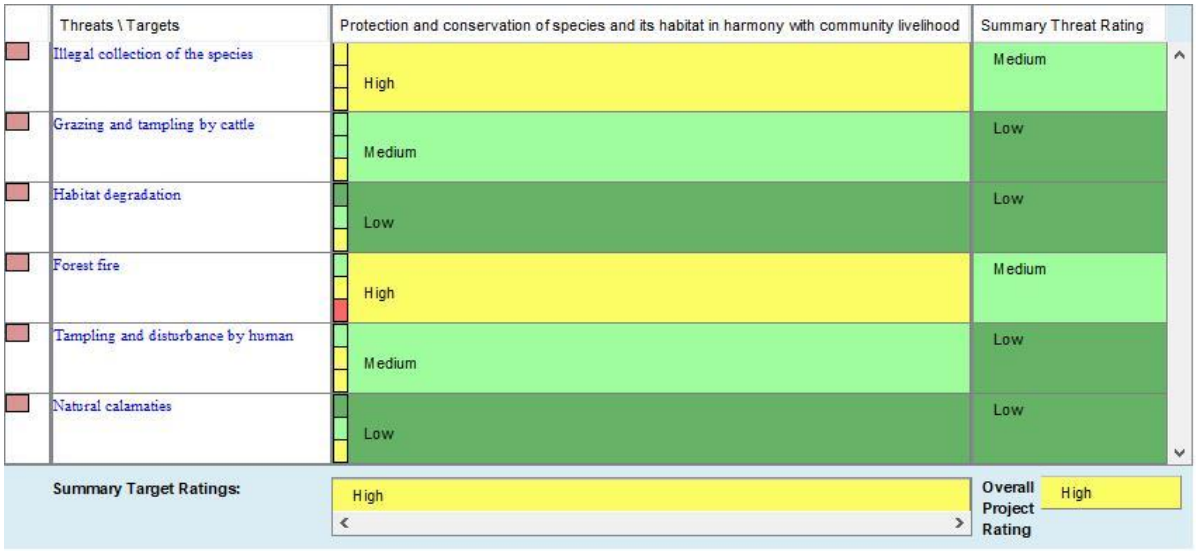

Figure 6. Threat ranking and score

Chapter 3: Conservation Plan.

Vision: Secured habitat with viable population of threaten orchid species

Goal: Protection of habitat and ecosystem to ensure enabling condition for species persistence of globally threatened orchid species with fulfilling the aspirations of local community.

Objectives:

I. To protect and conserve species and its habitat
II. To enhance community livelihood opportunities through conservation livelihood alternatives

The strategies and actions for this action plan were derived based on the analysis of threats, conservation challenges, and conservation opportunities concerning conservation of five orchid species and community livelihood. It is designed to address the issues and overcome the barriers that hinder achieving the objectives and ultimate goal. The conceptual framework developed using the Miradi software summarizes the management plan's conservation targets, objectives, threats, strategies, and actions. This conservation action plan has two objectives and six strategies with 18 actions to achieve its goal in next ten years (Table 1).
The total financial outlay for the proposed action during the plan period is Nu.**15.00** million. Currently there is no proper secured fund for implementation of these interventions. Funding for this action plan will be proposed to various conservation donors including Bhutan for Life Project, Bhutan Trust Fund for Environmental Conservation and WWF-Bhutan. If the full

package is not secured for fund support, priority activities will be tagged with division and gewog activities.

Figure 7. New record of Paphiopedilum species from the site (Paphiopedilum pradhanii)

Table 1: Implementation framework

Objectives	Strategies	Actions	Year along with budget (in Million Nu.)										Activity Total	Remarks
			Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10		
Objective 1: To protect and conserve species and its habitat	Strategy 1.1 Create awareness and educate on species conservation using various multimedia platforms	Action 1.1.1 Conduct orchid conservation awareness to local communities, local government and students	0.15			0.15			0.15			0.15	0.6	Ngangla-Trong and Kaktong community, Kaktong primary school, Dungkhag sector heads and Ngangla geog staff
		Action 1.1.2 Installation of conservation awareness signage	0.4				0.1						0.5	
		Action 1.1.3 Orchid conservation information centre support to school		0.3			0.2				0.2		0.7	Form student orchid conservation club and information centre support at Kaktong primary school
	Strategy 1.2 Enhance SMART patrolling in the area	Action 1.2.1 Conduct regular SMART patrolling	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1	
		Action 1.2.2 Train field rangers on tactical enforcement		0.3				0.3					0.6	
		Action 1.2.3 Initiate Citizen Scientist (Local communities) for monitoring and protection of site	0.4				0.3			0.3			1	Ngangla-Trong and Kaktong community
	Strategy 1.3 Enhance ecological knowledge on species	Action 1.3.1 Annual survey and monitoring of the species population at the site to understand the population dynamics	0.3	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1	1.2	
		Action 1.3.2 Rescue and restore the species from other areas facing irreversible damage											0	
		Action 1.3.3 Mid-term review and evaluation of action plan					0.2						0.2	Rescue as and when required
Objective 2: To enhance communit	Strategy 2.1 Initiate Social Developme	Action 2.1.1 Development of orchid watch trail		0.8									0.8	
		Action 2.1.2 Support homestay development			0.4								0.4	

y livelihood opportunities through conservation livelihood alternatives	nt for Conservation (SD4C) initiatives	Action 2.1.3 Support in supplying high yielding livestock (Jersy cow, poultry, pigger, fishery farm)					0.7						0.7	Ngangla-Trong and Kaktong community
		Action 2.1.4 Support solar or electric fencing to the communities			0.3				0.3				0.6	Ngangla-Trong and Kaktong community
		Action 2.1.5 Support permanent rural drinking water scheme		0.8									0.8	Change the drinking water sources from area outside KBA
		Action 2.1.6 Organize orchid festivals and celebrations to encourage community engagements				0.2							0.2	Ngangla-Trong and Kaktong community
		Action 2.1.7 Formation of community forest management group		0.2		0.2							0.4	Ngangla-Trong and Kaktong community
	Strategy 2.2 Promote propagation and domestication of orchid for ornamental sale	Action 2.2.1 Formation of ex-situ orchid conservation community group (Management plan, by-laws and business plan)	0.6										0.6	
		Action 2.2.2 Train group on orchid propagation and commercialization of the seedling	0.4										0.4	Ngangla-Trong and Kaktong community
		Action 2.2.3 Orchid propagation knowledge enhancement of the group		0.4			0.4				0.4		1.2	
		Total budget	**2.35**	**3**	**0.9**	**0.75**	**2.1**	**0.5**	**0.65**	**0.5**	**0.8**	**0.35**	**11.9**	

Do's and Don'ts

The site is inclusively in the state reserve forest and the major restriction in the site will be as per the existing rules and regulations governing protection of state reserve forest. Local communities have frequent visit to the site and researchers also explore the site for research. Therefore, following do's and don'ts are critical for better conservation and management of site, which is based on its population distribution habitat classification (Figure 8).

Sl.No	Activity	Prime Habitat(PH)	Outside PH	Remarks
1	Grazing	X	√	
2	Timber extraction	X	√	
3	NWFP collection	X	√	
4	Firewood collection	X	√	
5	Fodder collection	X	√	
6	Collection of orchids	X	X	Only under the approved and regulated norms
7	Research (Specimen collection)	√	√	With prior approval from department and no specimen collection if individual is less than 3
8	Developmental activities	X	√	

Figure 8. Population distribution habitat classification

Chapter 4: Monitoring and Evaluation

The monitoring at the field level shall be done by the Zhemgang Forest Division throughout the implementation phase. Major review and evaluation will be conducted in the 5th year of the plan period, to determine if the objectives, strategies, actions and schedules planned have been reached so that action can be taken to correct the mistakes as quickly as possible. Monitoring of this plan will be guided by the monitoring framework, which has indicative output indicators with achievement targets and schedules across the plan period.

Table 2*: Monitoring framework*

Objectives	Strategies	Actions	Output indicator	Baseline	Unit	Yearly target									
						Y1	Y2	Y3	Y4	Y5	Y6	Y7	Y8	Y9	Y10
Objective 1: To protect and conserve species and its habitat	Strategy 1.1 Create awareness and educate on species conservation using various multimedia platforms	Action 1.1.1 Conduct orchid conservation awareness to local communities, local government and school student	No. of awareness conducted	1	Nos.	2			2			2			2
		Action 1.1.2 Installation of conservation awareness signage	No. of signage installed	0	Nos.	5				3					
		Action 1.1.3 Orchid conservation information centre support to school	Report on established information centre	0	Report		1								
	Strategy 1.2 Enhance SMART patrolling in the area	Action 1.2.1 Conduct regular SMART patrolling	No. of SMART patrolling conducted and report produced	10	Nos.	4	4	4	4	4	4	4	4	4	4
		Action 1.2.2 Train field rangers on tactical enforcement	No. of forestry staff trained	7	Nos.		6				6				
		Action 1.2.3 Initiate Citizen Scientist (Local communities) for monitoring and protection of site	Citizen science group formed and report produced	0	Nos.	1									
	Strategy 1.3 Enhance	Action 1.3.1 Annual survey and monitoring of species population in the site to understand the population dynamics	No. of survey conducted and report produced	1	Nos.	1	1	1	1	1	1	1	1	1	1

	ecological knowledge on species	Action 1.3.2 Rescue and restore the species from other areas facing irreversible damage	As and when required	NA	NA										
		Action 1.3.3 Mid-term review and evaluation of the action plan	No. of monitoring conducted and report produced	0	Nos.					1					
Objective 2: To enhance community livelihood opportunities through conservation livelihood alternatives	Strategy 2.1 Initiate Social Development for Conservation (SD4C) initiatives	Action 2.1.1 Development of the orchid watch Eco trail	No. of Eco trail developed	0	Nos.		1								
		Action 2.1.2 Support homestay development	Homestay group formed, trained and management plan prepared	0	Nos.			1							
		Action 2.1.3 Support in supplying high yielding livestock (Jersy cow, poultry, piggery, fishery farm)	No. of households benefited	0	Nos.					30					
		Action 2.1.4 Support solar or electric fencing to the communities	No. of households benefited	0	Nos.			20				25			
		Action 2.1.5 Support permanent rural drinking water scheme	No. of households benefited	0	Nos.		25								
		Action 2.1.6 Organize orchid festivals and celebrations to encourage community engagements	No. of households benefited	0	Nos.				70						
		Action 2.1.7 Formation of community forest management group	No. of CFs established	0	Nos.		1		1						
	Strategy 2.2 Promote propagation and domestication of orchid for ornamental sale	Action 2.2.1 Formation of ex-situ orchid conservation community group (Management plan, by-laws and business plan)	No. of ex-situ orchid conservation community group formed	0	Nos.	2									
		Action 2.2.2 Train group on orchid propagation and commercialization of the seedling	No. of households trained on orchid propagation	0	Nos.	40									
		Action 2.2.3 Orchid propagation knowledge enhancement of the group	No. of households benefited from the program	0	Nos.		35			35				35	

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Divisional Forest Office, Zhemgang

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