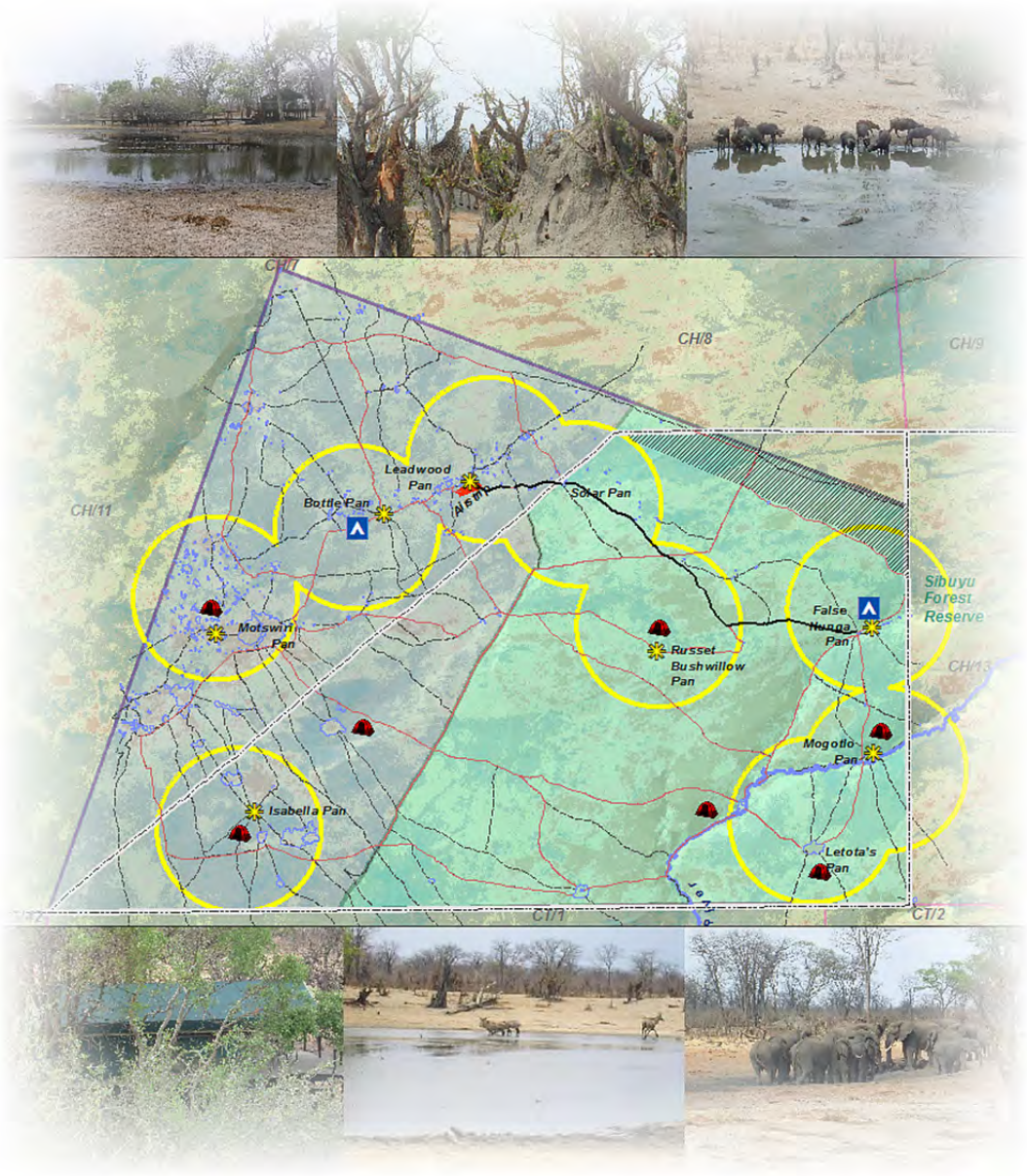
CH/12 CONCESSION AREA



MANAGEMENT PLAN

Prepared By

GIS Plan

For

CHOBE LAND BOARD
KABO LE TSHOMARELO YA LEFATSHE

botswana tourism

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Management Plan for Controlled Hunting Area CH/12
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This Management Plan for the Controlled Hunting Area CH/12 was developed by GISPlan (Pty) Limited on behalf of Botswana Tourism Organisation.

Document Recommended and Adopted by the CH/12 Reference Group:

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2. Chobe Land Board
3. Department of Environmental Affairs (DEA)
4. Department of Forestry and Range Resources (DFRR)
5. Department of Tourism (DoT)
6. Department of Wildlife and National Parks (DWNP)
7. Chobe District Council
8. District Commissioner's office

Document Approval:

This Tourism Management Plan was approved by Chobe Land Board on _____.

_____ _____
CEO, Botswana Tourism Organisation Date

_____ _____
Chairman, Chobe Land Board Date

_____ _____
Secretary, Chobe Land Board Date

Plan Validity Period: 15 years **Plan Review:** every 5 years (or as and when necessary)

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Special thanks and gratitude go to Botswana Tourism Organisation staff whose persistent prodding, insistence on details, invaluable suggestions, encouragements and cooperation went a long way in bringing out the best from the consultants. For the Reference Group as a whole, we must not fail to acknowledge its passionate dedication and commitment to the project, which were so often demonstrated by its constructive comments and insightful suggestions on how to add value to our work outputs, which in no small measure greatly improved the quality of the final product. For all these we are very grateful.

GISPlan Consulting Team

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List of Acronyms

AWP	Artificial Water Point
BTO	Botswana Tourism Organisation
BOGA	Botswana Guides Association
BWMA	Botswana Wildlife Management Association
CBD	Convention on Biological Diversity
CHA	Controlled Hunting Area
CAAB	Civil Aviation Authority of Botswana
CARACAL	Centre for Conservation of African Resources, Animals, Communities, and Land Use
CLB	Chobe Land Board
CMC	Concession Management Committee
CNP	Chobe National Park
DEA	Department of Environmental Affairs
DES	Department of Environmental Science
DFRR	Department of Forestry and Range Resources
DIES	Dubel Integrated Environmental Services
DLUPU	District Land Use Planning Unit
DoBS	Department of Biological Sciences
DMS	Department of Meteorological Services
DNMM	Department of National Museum and Monuments
DoT	Department of Tourism
DWA	Department of Water Affairs
DSM	Department of Survey and Mapping
DWNP	Department of Wildlife and National Parks
DWMPC	Department of Waste Management and Pollution Control
EA	Environmental Assessment
EIA	Environmental Impact Assessment
EWB	Elephants Without Borders
GIS	Geographic Information System
GoB	Government of Botswana
HATAB	Hospitality and Tourism Association of Botswana
HNP	Hwange National Park
IUCN	International Union for Conservation of Nature
KAZA TFCA	Kavango Zambezi Transfrontier Conservation Area
KCS	Kalahari Conservation Society
MoU	Memorandum of Understanding
NWMP	National Water Master Plan
NBSAP	National Biodiversity Strategy and Action Plan
NGO	Non-Government Organisation
NES	National Eco-Tourism Strategy
NSP	National Settlement Policy
PA	Protected Area
ORI	Okavango Research Institute of the University of Botswana
SEA	Strategic Environmental Assessment
SWOT	Strengths, Weaknesses, Opportunities, Threats
TAC	Technical Advisory Committee
UNWTO	United Nations World Tourism Organisation
UNCED	United Nations Conference on Environment and Development
WMA	Wildlife Management Area
WMARG	Wildlife Management Area Reference Group

Executive Summary

This document represents the Tourism Management Plan for CH/12 concession area residing in the Nunga Wildlife Management Area (WMA). Its purpose is to provide a framework for management of the values and use of CH/12 that is approved by relevant authorities, notably Botswana Tourism Organisation and Chobe Land Board. This Plan sets objectives for the concession area, recommends management prescriptions both as policy and as management actions to realise the objectives, and advises on a monitoring system to evaluate whether the objectives are being achieved. It also proposes the management framework within which subsequent implementation and further detailed planning will take place.

The Tourism Management Plan for CH/12 has been developed against the backdrop of the planning system in Botswana and to a very large extent, draws guidance and direction from the new Final Draft Wildlife Management Area Regulations of 2010. These have been complemented by reviews of other relevant Management Plans and Reports, field surveys, stakeholder consultations and interviews, as well as, the remits of the Terms of Reference (ToR) as issued by Botswana Tourism Organisation.

Site Description and Status

CH/12 lies in the southern portion of the Chobe District. It covers an area of 1487.8 $km^{2.}$ The concession area, together with these adjacent concession areas and associated forest reserves form linkages between Chobe National Park, Makgadikgadi and Nxai Pans National Park and Hwange National Park.

CH/12 is generally flat, with scattered pan depressions. The drainage in the area comprise mainly of the Mopane pan system with the seasonal Nunga River occurring in the south eastern section. The vegetation of the area can be generally described as dry woodland savanna, with scattered shrub savanna or grasslands.

CH/12 has limited permanent surface water for use by wildlife. Surface water under natural conditions is only found in pans and depressions in fossil river and mophane woodlands after rains. Provision of artificial water points in CH/12 is therefore a major management intervention. Currently there are seven artificial water points. Permanent artificial water provision is through pumping water into existing natural pans. Distance between water points in the concession varies from 5.6 km (minimum) to 13.2 km (maximum) with an average nearest neighborhood distance of 8.8 km. It has furthermore demonstrated that there is virtually no part of the concession area that is greater than 15 km from a water source.

With regard to wildlife, it was observed that animal numbers in CH/12 have increased, most likely as a result of the availability of permanent artificial water points. Elephant and buffalo are the most notable large mammal species sighted in CH/12. Rare and endangered species such as sable antelope, roan antelope and wild dogs have also increased in numbers. Predators such as lions and leopards have also become resident in the concession area

At present, there is no human settlement within CH/12 apart from the semi-permanent Bottle Pan Camp. The concession is 48 km away from the nearest village (Pandamatenga) to the north-east, 110 km from Kasane to the north, and 200 km from Nata to the south-east. Road access to CH/12 is through the existing cut line connecting the Nata-Kazungula Road (A33) near Pandamatenga. The area is also accessible by air via a registered airstrip located 5 km northeast of the Bottle Pan Camp.

CH/12 is gazetted Controlled Hunting Area (CHA), which is essentially an administrative designation established to facilitate the administration and management of the wildlife resources. CHAs are designated by the Wildlife Conservation and National Parks Act of 1972.

In terms of land use designation, CH/12 is a concession (or commercial lease-able unit) currently zoned for "Consumptive Wildlife Resource Uses". Though the lease designating the concession for the consumptive tourism purposes has essentially expired in September 2011, it was extended by two years, during which the preparation of a new Tourism Management Plan had to be completed together with all other prerequisites for converting the concession area from "consumptive wildlife resource uses" to "photographic tourism use" ("Commercial Photographic Area").

CH/12 is also part of the Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) which was formally established in August 2011 when the Heads of States of the Republics of Angola, Botswana, Namibia, Zambia and Zimbabwe signed the KAZA Treaty at the SADC Summit in Luanda, Angola.

Land tenure in CH/12 is tribal with Chobe Land Board (CLB) having jurisdiction over the area. The management of CH/12 and its resources is directed by the provisions of enabling legislations, in particular the Tribal Land Act (CAP.32:02) and the Wildlife Conservation and National Parks (CAP38:01). The management is multi-sectoral and involves central government departments, district authorities and the private (commercial) sector.

Identified Issues and Challenges

An appraisal of the existing situation revealed that biodiversity status in CH/12 remains in relatively good conditions and, except for human-induced fires, there are few other serious threats to the biodiversity of CH/12 that require urgent reactions. Wilderness characteristics as they relate to processes, appearance and composition of the ecosystems within CH/12 are maintained.

Conflicts between grass cutters and tourism activities remain a major potential threat although no major conflict has been reported yet, and the situation is still under control.

With regard to environmental issues, the situational appraisal revealed that the existing Bottle Pan Camp, as well as the borehole pumps use generators, which are not environmentally friendly, in terms of noise pollution, as well as oil and diesel spillages. The current Concession Manager indicated that they are on course to replacing the diesel pumps with solar powered ones commencing end of February 2013

CH/12 Tourism Opportunity Status

The overarching management goal for Concession Area CH/12 is "to unlock the ecotourism potential of the area in a sustainable manner recognizing that the largely unspoilt natural environment and wilderness is a major draw card for tourists". The following specific management objectives are formulated for CH/12:

(i) Transforming the current consumptive use of CH/12's and its environmental resources into 'photographic' sustainable tourism assets;
(ii) Proposing ecotourism products found to be feasible and complementary with products of neighboring WMA and PAs;
(iii) Promoting the long term maintenance and preservation of the biodiversity and where necessary ensuring its rehabilitation and restoration;
(iv) Ensuring that CH/12 is managed so that it can continue to function and evolve with minimum human intervention and where the integrity of landscapes and scenery is protected;
(v) Adopting and implementing a "green" (eco-tourism) strategy;

Prescribed Concession Model of CH/12

The Management Plan prescribes that CH/12 be designated as a "Commercial Concession" designated for photographic tourism use. It also allows the concession to continue be leased to a single commercial operator for a period of 15 years.

Ecotourism Management Zones for CH/12

CH/12 is divided into two ecotourism management zones:

(i) Management Zone 1: Western Exclusive Wilderness Zone;
(ii) Management Zone 2: Eastern Low Density Semi-Wilderness Zone

The purpose of the CH/12 zoning scheme is fourfold:

(i) To provide a spectrum of resource conditions and tourism opportunities within each ecotourism management zone;
(ii) To identify the level and intensity of usage that is acceptable based on the current understanding of sensitivities prevailing in different areas of CH/12.
(iii) To indicate which management directions should have priority in each ecotourism management zone
(iv) To provide specifications on the scale of facilities permitted within each ecotourism management zone

Management Zone 1: Western Exclusive Wilderness Zone

The zone encompasses the western side of CH/12. It is a portion of the concession where resident wildlife species are mostly concentrated due to a highly palatable Acacia sp. and C. mopane plant communities prevailing around

seasonal and artificial (permanent) water sources. This zone stands as CH/12's best area for game viewing and wilderness experience.

The zone is intended to provide wilderness experiences to a smaller and generally affluent, clientele.

An appraisal of the situation revealed that wildlife habitat concerns together with the need to retain largely unmodified natural settings, limit potential for any new camps in this zone, without endangering its value and the quality of visitor recreation experiences. Accordingly, apart from the Bottle Pan Camp no new semi-permanent or permanent sites in this Zone should be developed.

The potential, however, does exist to increase the capacity at Bottle Pan Camp, whilst still maintaining the low use characteristics of the Zone. In this regard, the Plan allows for increase in accommodation capacity of the existing Bottle Pan Camp from the existing 6-visitor bed capacity up to a total of 24 beds.

Management Zone 2- Eastern Low Density Semi-Wilderness Zone

The zone encompasses the eastern side of CH/12. It is a portion of the concession area dominated by *Terminalia sericea* plant community, which (when in good condition) provides valuable year-round habitat for Roan antelope, as well as other selective feeders including elephants. The zone furthermore includes areas of relatively high wilderness quality, such as areas along the Nunga River valley and around False Nunga Pan.

This zone stands as the CH/12's second best area for game viewing with ecotourism potentials related to scenery, wildlife viewing vistas around natural pans, as well as mobile safaris and camping experiences

The aim of this zone is to provide areas for exclusive motorised and non-motorized tourism in the dry, largely unmodified natural wilderness settings. Besides high-end remote lodging visitors, the mid-range ecotourism market segment typified by tour guide-conducted groups, pursuing nature-based recreational activities is recommended in this zone.

An appraisal of the situation revealed that habitat concerns and the area's vulnerability to human interference limit potential for permanent or semi-permanent tourism facilities in this zone. This Plan prescribes that one "30-beds camp or lodge" near the False Nunga Pan shall be allowed in this Zone. The Camp or lodge should be attuned for photographic tourism purposes.

Environmental Considerations – Service Infrastructure

The prospective concessionaire shall be required to pay considerable attention to environmental performance of service infrastructure in CH/12 and set 'high standards" that would minimize impact on the CH/12 environment. An alignment with, at least, "Green" level service infrastructure standards, developed by the Botswana Ecotourism Certification System (BECS) is strongly encouraged.

In order to minimize potential pollution risk to the CH/12 environment, it will be a requirement for all camps or lodges in CH/12 to determine the appropriateness of their wastewater treatment technology. The prospective concessionaires shall be required to avail the existing documentation on detailed investigation of the prevailing site conditions, which will serve to justify the selection and usage of a particular effluent disposal technology.

To minimize greenhouse gas emission and oil contamination risks, all camps in CH/12 shall be required to base their energy requirements on increased deployment of alternative and low impact energy sources. The prospective concessionaire shall be required to replace all diesel-generator-based borehole pumps with more eco-friendly solar powered solution given the need to reduce operational costs, as well as oil and noise pollution around artificial water points

No public waste facilities shall be permitted in CH/12. All solid waste shall be appropriately separated and stored within a covered area, with wildlife proof cage/storage area on concrete or solid floor to stop leakage and soil contamination, while waiting to be taken to the landfill in Kasane.

It shall be the prospective concessionaire responsibility to manage the supply of safe potable water to all end users in CH/12 in accordance with the legal framework. Additional water point (boreholes) development shall be permitted in CH/12 but only at (or in close proximity to) accommodation sites and for purpose of potable water supply of new camps or lodges. The prospective concessionaire shall, however, not be allowed to develop any artificial water point at locations other than existing ones to provide water for wildlife

Mobile Campground Facilities in CH/12

Besides remote lodging in CH/12, it is considered to be an opportunity for the prospective concessionaire to grow tourism by using mobile campground facilities. It shall be responsibility of the prospective concessionaire to identify a workable network of the campgrounds micro-locations for each ecotourism management zones in CH/12, preferably with durable (less sensitive) vegetation cover. It is, in this regard, expected that the positioning of mobile campgrounds shall be peripheral to the sensitive areas and wildlife scenic vistas around natural and artificial water points;

Access Control to CH/12

The Tourism Management Plan recognizes the need for establishing effective access control mechanisms in CH/12 which would ensure orderly and responsible behaviour. In this regard, the Plan prescribes the following:

(i) From the access management viewpoint, CH/12 shall be designated as an Exclusive Area, limited to concession holders that have specific use or development rights as defined in lease agreements. Consequently, no unauthorized person shall be allowed to enter CH/12 for any commercial purposes without consent of the prospective concessionaire.

(ii) Exclusive access to the CH/12 also relates to community members who, for the purpose of natural resource consumption or any other commercial purpose, shall seek the concessionaire's consent, issued in agreement with the local Traditional Authority. With regard to this, it is considered essential for the prospective concessionaire to recognise community rights for natural resources utilisation and be informed by the relevant Central Government department (e.g. DFRR) and communities about the type and details of veld product use in CH/12. Similarly, communities need to be sensitised on the "exclusive access" status of CH/12, as well as on the operational character and preferences of ecotourism, in order to minimise potential for conflict.

Given the complexity of the harvesting of natural resources in general, and grass cutting issues in particular, the Code of Conduct for Grass Cutters in CH/12 is proposed in this Tourism Management Plan.

Biodiversity Conservation and Management

There shall be a requirement for the prospective concessionaire in CH/12 to implement the "Protocol for the Monitoring of Fauna and Flora in Botswana" (DWNP 2013)".

Proposed Management Framework for CH/12

The Management Plan prescribes the CH/12 Concession Management Committee (CMC). It shall be responsible for guiding the ongoing development in the concession and ensuring compliance with, and implementation of, agreed management regulations and requirements stipulated in this Tourism Management Plan. The CMC is expected to be composed of the prospective concessionaire, on-site camp or lodge managers, and, when necessary, may include representatives of surrounding communities, as well as the Technical Advisory Committee (TAC) which is a district body coordinated by the District Commissioner and facilitated by the Department of Wildlife and National Parks.

General Introductions

CHAPTER 1: GENERAL INTRODUCTION

1.1 INTRODUCTION AND BACKGROUND INFORMATION

1.1.1 The tourism sector is a major driver of economic growth in the Botswana and is the second highest foreign exchange earner, after the mining sector. The tourism sector has over the years made significant contributions to the national economy. It is important that efforts should continually be made to strengthen and develop the tourism sector to its full potential and in the process, provide appropriate and adequate measures for the management and operation of tourism assets in the country, in a manner that ensures sustainability and good economic returns. CH/12, a gazetted Controlled Hunting Area (CHA; hereinafter referred to as "concession" or "concession area"), located in Chobe District in Northern Botswana, is one of such tourism assets. The rich diversity of fauna and flora in Northern Botswana, as well as its diverse and dynamic ecosystems, has been the main draw card for Botswana's tourism industry. It is therefore important that efforts should continually be made at improving tourism activities and the management thereof in concession areas such as CH/12. On this basis, it is a welcome development by Chobe Land Board and Botswana Tourism Organisation to have initiated the development of a Tourism Management Plan for CH/12, as part of their efforts in ensuring that concession areas are appropriately and professionally managed.

1.1.2 CH/12 has been utilised as a hunting area for many years and Bottle Pan Safaris has conducted trophy hunting in the area for the past seven years. However, the Government of Botswana recently resolved to convert CH/12 and other CHA's located within the 25km buffer zone around protected areas, from consumptive tourism use (hunting) to photographic tourism use. In light of this, the Tourism Management Plan for CH/12 is expected to provide the necessary guidance for the transition of the area from a hunting concession to a photographic concession area. This Tourism Management Plan hence provides management guidelines and measures that will ensure the efficient functioning and operation of the concession area, such that good visitor experience and economic returns are attained.

1.2 SCOPE, FUNCTIONS AND TIME-FRAME OF THE TOURISM MANAGEMENT PLAN

1.2.1 The Tourism Management Plan for CH/12 is a management and regulatory tool for activities in the concession area and is meant to ensure the sustainable utilisation and management of resources therein. Specifically, the Tourism Management Plan provides guidance and regulatory measures on the types and sequence of non-consumptive tourism activities in the area, as well as how to fully exploit and develop the concession's tourism potential. The Plan has a 15-year planning horizon that will be tied to the lease period, and will be reviewed every five years.

1.2.2 In the process of developing the Tourism Management Plan for CH/12, an update of existing documentation of Management Plan(s) relating to the concession area was carried out. The Management Plan has, amongst other things:

(i) Outline a tourism development vision for the concession area;

(ii) Set management goals and objectives;

(iii) Detailed how the concession area will be managed in the years ahead;

(iv) Stipulated management obligations

1.2.3 In addition to the above, the Tourism Management Plan has profiled and analysed the existing situations in the concession area as they relate to:

(i) Land use types and land use activities;

(ii) Management structures;

(iii) Management practices in terms of utilisation and conservation of natural resources, and the impacts of such practices on the ecosystem and the general environment.

1.2.4 Furthermore in terms of scope, the Tourism Management Plan for CH/12 provides operational guidelines and standards that should be adhered to in the course of conducting photographic tourism activities in the area. These relate to such aspects:

(i) Management of pollution , littering, sewage and waste disposal;

(ii) Fire management;

(iii) Fuel storage;

(iv) Safety, security and access control;

(v) Infrastructure and physical development;

(vi) Implementation strategy and frame work;

(vii) Development programme and schedule;

(viii) Monitoring framework, with monitoring indicators; and

(ix) Environmental monitoring guidelines

1.2.5 In the context of a management and regulatory tool for efficient tourism development and activities in CH/12, the Tourism Management Plan serves the following specific functions:

(i) Provides a broad site description, identifies its values and assesses threats to these values through analysis of both current and potential risks and/or concerns;

(ii) Identifies and examines the legislative, policy and any related management instruments which will (in)directly influence the management of the area;

(iii) Provides information on ecologically sustainable tourism development opportunities in CH/12, as well as designs and technologies that constitute best practices for use in environments such as CH/12;

(iv) Provides the prospective concessionaire(s) of the area with a management tool and guidelines within which they must operate to ensure the efficient functioning/operation of the concession area;

(v) Provides guidelines for the efficient conduct of non-consumptive/photographic tourism activities in CH/12 and for the sustainable utilisation and conservation of natural resources therein;

(vi) Provides all relevant stakeholders with a tool for assisting them in carrying out their mandates of monitoring and inspecting activities in the concession area, in order to ensure compliance to the standards, guidelines and recommendations of the Tourism Management Plan;

(vii) Specifies the standards to which key requirements should be performed by concessionaire(s), and

(viii) Specifies management and tourism activities that should be carried out in CH/12;

1.3 UNDERLYING PRINCIPLES AND APPROACHES

1.3.1 The ecological and environmental status, natural resource base and the potentials for further tourism development in CH/12 have all informed the fundamental principles and norms that were applied in the development of the Tourism Management Plan. It was, however, imperative that the Tourism Management Plan be underpinned by the principles and norms of ecological and environmental sustainability.

1.3.2 In developing a Tourism Management Plan for CH/12, it was critical to ensure that all the tourism activities recommended are developed based on the sustainable tourism framework. Sustainable tourism has since the 1990s become the main framework that informs and guides the formulation of tourism policies, strategies, plans and activities in Botswana. The principles of sustainable tourism development are included in Botswana's tourism and conservation pronouncements such as: the Tourism Policy of 1990 (under review), the Wildlife Conservation Policy of 1986 (under review), the Ecotourism Strategy of 2002, Tourism Master Plan of 2000, and the Community-Based Natural Resource Management Policy of 2007. The infusion of sustainable tourism in Botswana's tourism development strategies means that any Tourism Management Plan in an area such as CH/12, should not depart from these national and global stipulations and standards.

1.3.3 Sustainable tourism in the context of sustainable development was a central approach in the development of a Tourism Management Plan for CH/12. On the one hand, sustainable development is development that meets the needs of the present generation without compromising the ability of future generations to meet their own needs. On the other hand, tourist satisfaction is also an important goal of sustainable tourism to be considered when a Tourism Management Plan is developed. As such, sustainable tourism is tourism that conserves resources, while maintaining tourist satisfaction. This therefore calls for adherence to tourism carrying capacities, auditing of tourism impacts on the environment and adopting management interventions supportive to local communities.

1.3.4 Fundamentally, the development of a Tourism Management Plan for CH/12 was guided by the following questions:

(i) What goals should be attained?

(ii) What actions should be taken to achieve the goals?

(iii) How can success be measured?

(iv) What must be done to achieve management effectiveness?

(v) How can acquired knowledge be captured to enable stakeholders involved in the management of CH/12 respond, through monitoring and feedback, to the changes, which might occur in the concession area?

1.3.5 In providing answers to the above questions, a process of adaptive management and a management philosophy that best suits the type of tourism in the concession area has been fashioned out.

1.3.6 The key approaches adopted in the development of a Tourism Management Plan for CH/12 are highlighted below.

Strategic and Value-Based Approach

1.3.7 The approach is based on the notion that strategic management is not merely strategic planning for one's future actions; rather it is acting with a purpose. In the context of CH/12, this acknowledges that the better we know the concession's desired status, the more likely we are to realize that aspiration.

Articulating a vision for the desired future state of CH/12 has been one of the first steps in the development of the Management Plan. The vision aimed at directing all future development and management actions while maintaining the natural character and appeal of the CH/12 environment. Prioritising a vision for the concession's desired future state will ensured that the Management Plan employed "value-based planning", which is oriented towards long-term goals serving ultimate values.

Participatory Approach

1.3.8 The development of the Tourism Management Plan for CH/12 was about inclusion and involvement of all concerned stakeholders by means of bringing them together to negotiate, consider and balance aspirations in a transparent and democratic manner. In other words, the integration of all relevant stakeholders into the Plan preparation process and consensus building has been vital.

Plan-Monitor-Manage (Adaptive Management) Approach

1.3.9 To meet the flexibility requirements, what was advocated is a more innovative approach to the development of the Tourism Management Plan. It departed from the traditional survey– analysis–plan, to plan-monitor-review-manage approach. The approach aimed at enabling the Plan to be constituted as a responsive series of events rather than a structure of static images. There was therefore need for a considerable degree of flexibility in the management process that would enable stakeholders entrusted with the Plan's implementation to respond, through monitoring and feedback, to the changes which might occur in the project area. In other words, a balance has been sought between long-term management strategies and development of short-term actions or projects, and this is especially relevant to tourism environments such as CH/12 where development impacts are hardly predictable and changes in management regimes are the norm.

Multi-disciplinary Approach

1.3.10 This Tourism Management Plan serves as a veritable guideline and tool to enhance the tourism potential, development and management of CH/12. To produce such a document, the Project Team has been multi-disciplinary in order to comprehensively address all objectives, tasks and facets required for the successful completion of the Management Plan. To this end, the Consulting Team has been composed of professionals in Land Use / Site Planning, GIS and Geodesign, Tourism, Ecology and Biodiversity Management.

Integrated Approach

1.3.11 An important approach to the development of the Tourism Management Plan relates to the conceptualization of its process. In this regard, a widely held view among the consultants was that the Plan needs to take into account a wide and diverse range of factors and concerns in order to incorporate them into a well-harmonized whole. The emphasis here is on integration of various

stakeholders' interests, policies and approaches in developing the Tourism Management Plan. As such, a Tourism Management Plan should balance and reconcile between various competing interests since:

(i) The project area is both an asset for tourism development and an environmental resource;

(ii) The Plan draws its goals and objectives from a wide variety of interests, but at the same time, seeks to mitigate potential threats or conflicts in the public interest;

(iii) The Plan deals with and operates across a number of scales of government, often involving the need to align and balance a variety of local and wider interests;

(iv) The Plan by its definition, seeks to achieve its intended goals by means of translating them into a variety of prescriptions, norms, guidelines and regulations which govern the management process, in consonance with other public policies and legislative pronouncements.

1.3.12 This Tourism Management Plan should be seen as a framework in which integration and a set of interrelationships between the various functions (sectors) prioritize certain criteria and actions over others and provide a point of reference for those making subsequent decisions. Therefore, in the interest of managing CH/12 and maximizing the potential of the area, it has been crucial to promote effective integration (coordination) between the different stakeholders involved in the planning and management of the concession area.

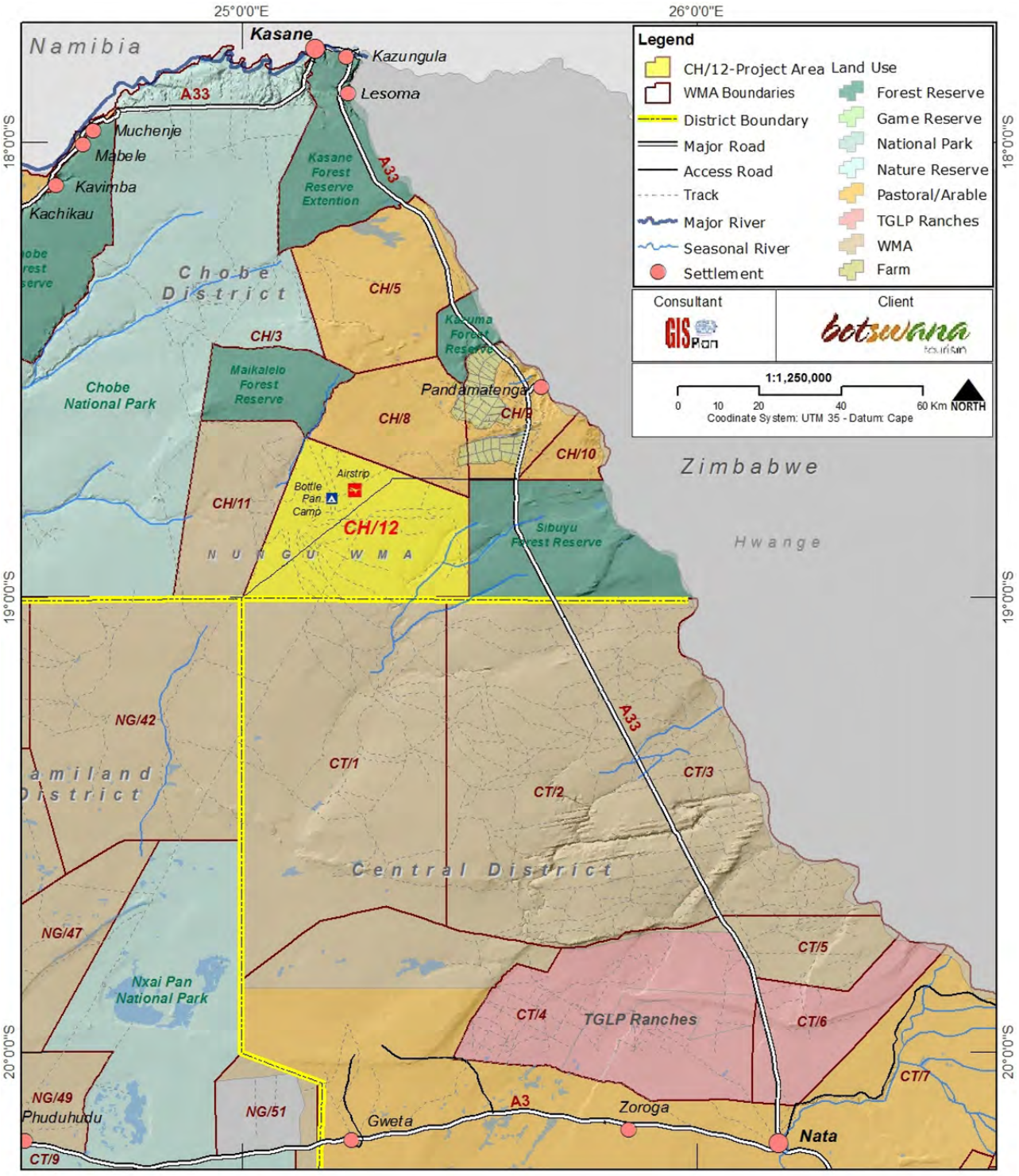
2

Site Description

CHAPTER 2: SITE DESCRIPTION

2.1 GEOGRAPHIC LOCATION, SIZE AND BOUNDARIES

2.1.1 As shown on Map 2.1, CH/12 lies in the southern portion of the Chobe District which together with Ngamiland District constitutes Northern Planning Region of Botswana as delineated by the National Settlement Policy (NSP) of 2004. In terms of spatial size, CH/12 covers an area of 1487.8km², which makes up 7.1% of the total land area of Chobe District.



Map 2.1: Location of the Concession Area CH/12

2.1.2 CH/12 is bordered by the concession areas CT/1 and, CT/2 in the south, CH/13 (Sibuyu Forest Reserve) in the east, CH/8 in the north, CH/7 (Maikaelelo Forest Reserve) in the northwest and CH/11 in the west. CH/12, together with these adjacent concession areas and associated forest reserves form linkages between Chobe National Park, Makgadikgadi and Nxai Pans National Park and Hwange National Park.

2.1.3 CH/12 is generally flat, with scattered pan depressions. The drainage in the area comprise mainly of the Mopane pan system with the seasonal Nunga River occurring in the south eastern section. The vegetation of the area can be generally described as tree and bush savanna, with scattered shrub savanna or grasslands.

2.1.4 With regard to wildlife, it was observed that animal numbers in CH/12 have increased, most likely as a result of the availability of permanent artificial water points. Elephant and buffalo are the most notable large mammal species sighted in CH/12. Rare and endangered species such as sable antelope, roan antelope and wild dogs have also increased in numbers. Predators such as lions and leopards have also become resident in the concession area.

2.1.5 At present, there is no human settlement within CH/12 apart from the semi-permanent Bottle Pan Camp. The concession is 48 km away from the nearest village (Pandamatenga) to the north-east, 110 km from Kasane to the north, and 200 km from Nata to the south-east. Road access to CH/12 is through the existing cut line connecting the Nata-Kazungula Road (A33) near Pandamatenga. The area is also accessible by air via a registered airstrip located 5 km northeast of the Bottle Pan Camp.

2.2 SITE STATUS

2.2.1 The administrative and functional status of CH/12, as well as its tourism development potential, is summarized hereunder.

Controlled Hunting Area

2.2.2 CH/12 is a gazetted Controlled Hunting Area, which is essentially a designation established to facilitate the administration and management of the wildlife resources adjacent to protected areas. CHAs are designated by the Wildlife Conservation and National Parks (CAP38:01). Specifically, under section 16 (2) of this Act, " *The Minister may, by order published in the Gazette, declare any area of land in Botswana to be a controlled hunting area, and may, in like manner, abolish declared controlled hunting areas or amend the boundaries of declared controlled hunting areas by adding other areas thereto or by deleting areas therefrom*"

2.2.3 According to the WCNP Act, CH/12 falls within the Nunga Wildlife Management Area. The specific demarcations of the concession area are furthermore stated in the Act as follows:

"*Commencing at a point CH/7/8/11/12, being the southeastern corner of the Maikaelelo Forest Reserve (approximate co-ordinates 35E303600N7937300); thence in a straight line in a southwesterly direction to a point CH/11/12/NG/42/CT/1, where the boundaries of the Chobe, Ngamiland and Central Districts meet (approximate co-ordinates 35E289500N7898000); thence east along the Chobe District boundary to a point CH/12/13/CT/2, which is the southwestern corner of the Sibuyu Forest Reserve, also being the southeastern corner of the Nunga Wildlife Management Area (approximate co-ordinates 35E342100N7898500); thence due north along the western boundary of this Wildlife Management Area to a point CH/8/12/13, being the northwestern corner of the Nunga Wildlife Management Area (approximate co-ordinates 35E341900N7922800); thence northwestwards in a straight line to the point of commencement.*"

2.2.4 In terms of land use designation, CH/12 is a concession (or commercial lease-able unit) currently zoned for "Consumptive Wildlife Resource Uses". Consumptive wildlife utilization involves wildlife off- take that is based on annual quotas allocated to the concessionaire by the Department of Wildlife and National Parks. (DWNP). Though the lease designating the concession for the consumptive tourism purposes has essentially expired in September 2011, it was extended by two years, during which the preparation of a new Tourism Management Plan had to be completed together with all other prerequisites necessary for converting the concession area from "consumptive wildlife resource uses" to "non-consumptive tourism use" ("Commercial Photographic Area").

2.2.5 CH/12 designation as a "Concession area" means that the area or its portions is subject to be used for tourism activities. The concession area is at present leased to a single commercial operator, (Bottle Pan Safaris.). The lease that expired in 2011, was subsequently extended to 2012, and later extended to 2013, to allow for the development of a Tourism Management Plan for the concession area.

2.3 SECTION OF KAVANGO - ZAMBEZI TRASFRONTIER CONSERVATION AREA (KAZA TFCA)

2.3.1 CH/12 is also part of the Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) which was formally established in August 2011 when the Heads of States of the Republics of Angola, Botswana, Namibia, Zambia and Zimbabwe signed the KAZA Treaty at the SADC Summit in Luanda, Angola. The signing of the Treaty established one of the world's largest and critical conservation landscapes spanning over 444,000 km^2 across the five member countries As illustrated in Figure 2.1, the KAZA TFCA includes a number of formally proclaimed national parks, game reserves, forest reserves and wildlife management areas, including CH/12.

2.3.2 The KAZA TFCA's focus is on conservation as the primary form of land use, with tourism being a by-product thereof. The major goal of the KAZA TFCA is "to sustainably manage the Kavango Zambezi ecosystem, its heritage and cultural resources based on best conservation and tourism models for the socio-economic wellbeing of the communities and other stakeholders in and around the eco-region through harmonization of policies, strategies and practices." (www.kavangozambezi.org).

2.3.3 The KAZA TFCA is very rich in biodiversity and its long term use and sustainable development is dependent on the wise use of its diverse natural resources base. In addition to this, the KAZA TFCA is the key mechanism for achieving the desired opening of systems that will enable improved mobility for wildlife and tourists, and socio-economic synergies between the participating States. It is, in this regard, expected that if the plans for the KAZA TFCA come to fruition, there will be an increased movement of tourists through the region wanting to experience the wide range of destinations offered. This will also establish the whole region (of which CH/12 is part of) as one of the world's most attractive tourism destinations. It is therefore not surprising that the KAZA TFCA strategic policy direction has tourism as its major driver of sustainable economic development.

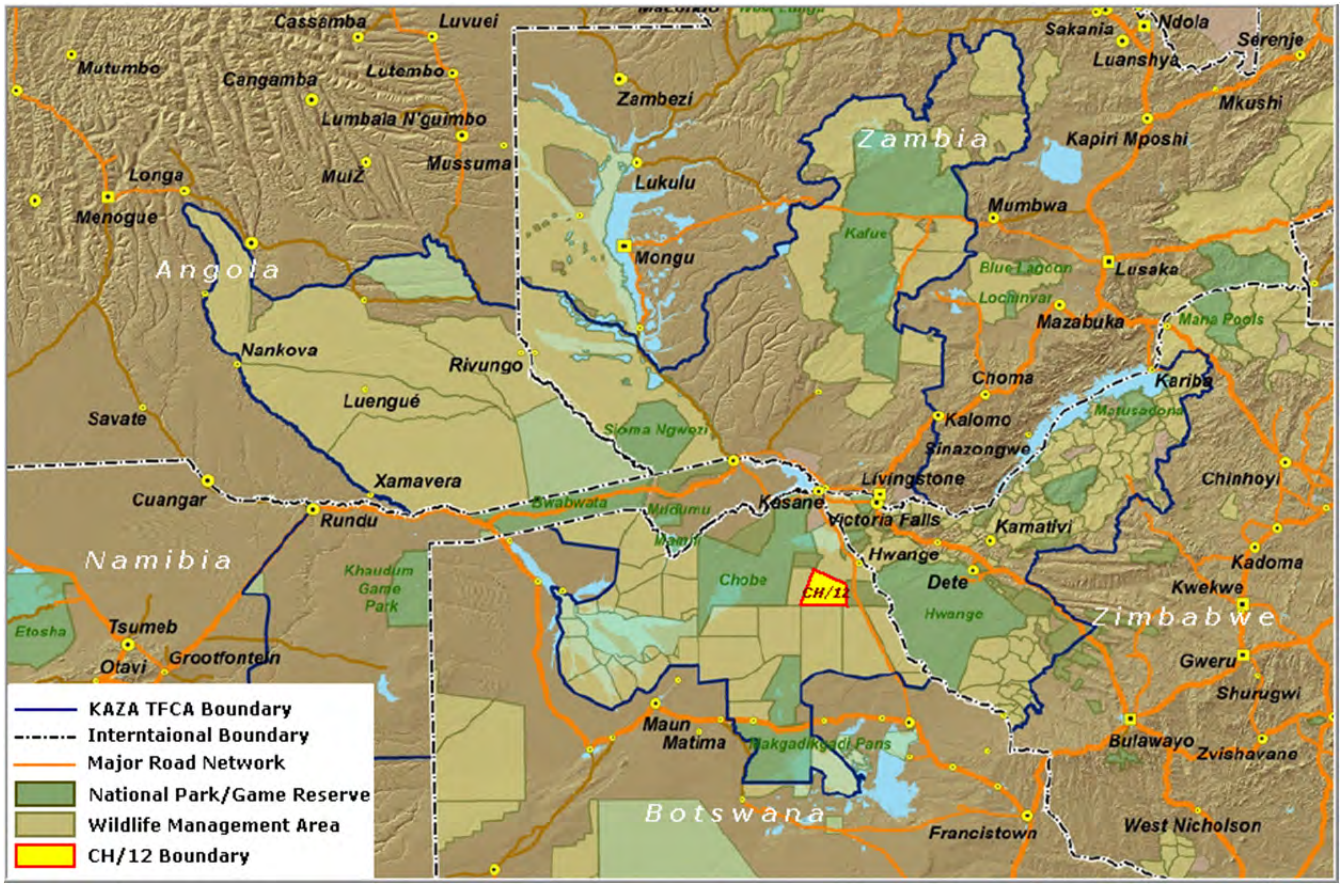


Figure 2.1: Location of CH/12 within the KAZA TFCA (Source: KAZA Secretariat)

2.4 LAND TENURE AND MANAGEMENT

2.4.1 Land tenure in CH/12 is tribal with Chobe Land Board (CLB) having jurisdiction over the area. The management of CH/12 and its resources is directed by the provisions of enabling legislations, in particular the Tribal Land Act (CAP.32:02) and the Wildlife Conservation and National Parks (CAP38:01). The management is multi-sectoral and involves Central Government departments, district authorities and the private sector. While central government is responsible for developing and overseeing implementation of national level policies and legislations, local (or district) authority is responsible for local-level policy administration and service provision.

2.4.2 Table 2.1 below summarises the management responsibilities and affiliations of different institutions for the Nunga WMA in general, and CH/12 in particular. As can be gleaned from the table, Central Government departments falling under Ministry of Environment, Wildlife and Tourism (MEWT) are the ones that are, together with Botswana Tourism Organisation (BTO), primarily responsible for regulating the tourism and wildlife sectors in the concession area.

2.4.3 District level administrative tasks are carried out by the District Administration, which includes the Chobe District Council and District Commissioner's Office. The Chobe Land Board (CLB) is, however, the primary institution responsible for land management on Tribal Land in the Chobe District, CH/12 included.

2.4.4 In addition to Local Government structures (Table 2.1), a number of Central Government departments have district offices in Kasane. This especially relates to the DWNP and its anti-poaching, fisheries and other divisions, the DWA and its hydrology and water quality units and, the DFRR and its forest reserve management and wild fires control units. The BTO and DoT also have also offices in Kasane due to the enormous importance of the tourism industry in northern

Botswana. The Kavango Zambezi Transfrontier Conservation Area (KAZA TFCA), also has an office in Kasane.

2.4.5 In addition to the central and local government department/units, there are also a number of non-governmental agencies/institutions, as well as private sector entities that are directly and/or indirectly involved in the planning and management of CH/12. This especially relates to the Hospitality and Tourism Association of Botswana (HATAB), the Botswana Wildlife Management Association (BOWMA) and the Botswana Guides Association (BOGA). Conservation NGOs represented in the District include Kalahari Conservation Society (KCS), Elephants Without Borders (EWB), Centre for Conservation of African Resources, Animals, Communities, and Land Use (CARACAL), and BirdLife Botswana. Several other institutions engaged in long-term research and monitoring are also present in the Chobe region, the largest of which is the University of Botswana mainly through the Okavango Research Institute (ORI), the Department of Biological Sciences (DoBS), and the Department of Environmental Sciences (DES).

2.4.6 The current multiplicity of sectoral policies, programmes, legislations and regulations that guide the use of land and natural resources creates challenges for effective planning, monitoring and management of CH/12. The responsibility for these policies, regulations and programmes is spread across a broad spectrum of institutions leading to fragmented implementation. It is, in this regard, possible to encounter divergences in policy objectives pursued by different institutions which, in turn, may result in sectoral land or resource use conflicts. In CH/12 these "conflicts" (though to a lesser extent) may be visible between the commercial sector (tourism), subsistence use (grass cutters) and the need for sustainable resource utilisation. With regard to this, there is need for integrated management of the concession area and enforcement of relevant legislation in order to improve the use and management of the CH/12's resources.

2.4.7 The complexity of the existing multi-sectoral and multi-layered institutional and management structures highlights the necessity for a strong coordinating body capable of ensuring integrated planning and management of the area's resources. The foundations of that coordinating body are laid down in the Wildlife Management Area Regulations of 2010 which is still awaiting Cabinet approval. Until a recognizable forum for integrated management to effectively coordinate responses is functioning, the ultimate challenge will be to ensure that stakeholder departments and agencies operating largely independently of each other are able to fulfill their mandates in a manner that represents an adequate response to current and future environmental and natural resource management issues in the concession area.

Table 2.1: Lead Management Institutions and Their Key Responsibilities in Managing CH/12

Central Government Institution	Roles/Functions
Department of Tourism (DoT) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Regulates tourism enterprises; – Set out procedures with respect to applications for tourism licensing; – Undertake inspections; – Serves as secretariat to the Tourism Licensing Committee.

Department of Wildlife and National Parks (DWNP) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Statutory responsibility for management of National Parks and Game Reserves; – Support for Wildlife Management Areas; – Enforces all legislation relating to wildlife resources; – Responsible for raising public awareness and appreciation of Botswana's wildlife resources; – Responsible for issuing guides and hunters licenses, hunting, capturing and culling, as well as fish and other wildlife farming permits. – Support for communities under the CBNRM policy (e.g. training of community wildlife guides) Given the character of CH/12 in terms of wildlife resources, the role of DWNP in the management of the concession area is quite critical.
Department of Environmental Affairs (DEA) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Competent authority for Environmental Assessment Act implementation – Responsible for overall coordination of environmental activities in Botswana;
Department of Forestry and Range Resources (DFRR) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Statutory responsibility over the utilisation of range resources including forest reserves management and implementation of the Forest Act and Policy; – Support to communities under the CBNRM policy; – Prevention and control of wild fires
Department of Waste Management and Pollution Control (DWMPC) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Providing policy direction in all matters pertaining to sanitation, waste management and pollution control; – Registering and licensing waste carriers and waste disposal sites and waste management facilities – Monitoring the collection, disposal and treatment of controlled wastes – Monitoring the level of pollutants in the environment.
Department of Water Affairs *Ministry Of Minerals, Energy And Water Resources (MMEWR*)	– Statutory responsibility over water resources in the country including supervision and control over ground and surface water utilisation and flow monitoring; – Allocation of water rights (ground and surface water) through the Water Apportionment Board
Department of National Museum and Monuments (DNMM) *Ministry of Environment, Wildlife and Tourism (MEWT)*	– Overseeing archaeological impact assessment process – Protection of national heritage sites
Department of Veterinary Services *Ministry Of Agriculture*	– Plays an active and important role in animal disease control policies and structures that have a direct impact on the ecological integrity of CH/12 and associated wildlife populations. – CH/12 is located close to CH/9, where there are framing activities hence disease control measures taken may affect the management of the concession. area

Parastatal Entities	Roles/Functions
Botswana Tourism Organisation (BTO)	– Marketing the country as a preferred tourism destination including product development and packaging, promotions and distributions; – Promoting investment in the tourism sector. – Coordinating efforts and resources of public and private sector partnership in tourism industry. – Grading and classification of tourist accommodation facilities, – Coordinating (on behalf of Chobe Land Board) preparation of a Tourism Management Plan for CH/12 concession area before it becomes the basis for tribal land allocations in the form of commercial lease agreements (concessions)
The Civil Aviation Authority of Botswana (CAAB)	– Register and license airports/airstrips – Regulate any adverse impact on the environment from aviation activities.
District (Local) Government Entities	**Roles/Functions**
Chobe Land Board (CLB) *Ministry of Lands and Housing* (MLH)	– Planning /zoning of tribal land in the District; – Allocation of land rights in the tribal land; – Revenue collection from rented land; – Collection of tourism royalties (Tribal Land); – Monitoring and evaluation of the whole tribal land management process Technical support structure of Chobe Land Board includes District Land Use Planning Unit (DLUPU). It serves as Land Board advisor in all matters relating to land use planning and land management. DLUPU is also a sub-committee of the District Development Committee (DDC) and is made up of different technical officers from Ministries and Departments with a stake in land use and related matters.
District Administration (DA)	– Coordinates the activities of Central Government departments in the district; – Oversees the implementation of government policies. District Administration also include the Technical Advisory Committee (TAC) which is a district body coordinated by District Commissioner and facilitated by the Department of Wildlife and National Parks. It is responsible for: – Coordinating CBNRM at a district level; – Advises communities and the district authorities upon any proposal that involves the commercial utilisation of community managed natural resources at district level, and monitors its implementation; – Monitors and guides the process of establishing a Joint Venture Partner for Community Based Organisations; – Assists in mediation in case of conflicts between communities and their Joint Venture Partner; and – Ensures that government policies and legislation are adhered to where commercial utilisation of natural resources is concerned
Chobe District Council (ChDC)	– Local political body that provides development leadership at the district level; – Issuing trading and other permits, including enforcement of bye laws – Responsible for the development and implementation of various District Plans, some of which are developed jointly with the Land Board – Provides a wide variety of services to communities and/or tourist operators within the District in general and CH/12 in particular.

Tribal Administration (TA)	– Responsible for tribal matters in the district including administration of tribal justice through the traditional courts (Kgotla) system; – Assist in the identification and monitoring of subsistence uses in tribal land; – Stimulate the use of culture and traditional knowledge in ecotourism; – Contribute to conflict resolution, particularly between subsistence and commercial uses, as well as between private tourism operators and community
Private Sector & Non-Governmental Organisations	Role/Responsibility
CH/12 Tourism Concessionaire	– CH/12 concession has been leased by Chobe Land Board to Bottle Pan Safaris (Pty) LTD. – The concessionaire is granted exclusive right to conduct 'consumptive tourism activities within CH/12 on the basis of concession (lease) agreement which is to expire in September, 2013. – The agreement clarifies the details of the concession including, amongst other things, the degree to which management responsibility for the area and other matters (such as accessibility and natural resource use) are delegated to the concessionaire.
Hospitality and Tourism Association of Botswana (HATAB)	– Voluntary membership association which presently includes more than 40% of all registered and operating tourism enterprises in the country; – Umbrella organization representing all sectors of the tourism industry; – Provides and enforces codes of conduct for its members; – Champions the business interests of its members through lobbying for a conductive legislative investment environment
Botswana Guides Association (BOGA)	– A networking and advisory organization established to promote the development of the locally based tour and safari industry in Botswana – Works towards on-going improvement and maintenance of high standards, professionalism and ethics of the tour and safari industry in Botswana.
Botswana Wildlife Management Association (BWMA)	– Represent a platform for the industry to facilitate contact with Government, its Ministries and Departments which are concerned with wildlife and land utilization, and with associations and societies concerned with the conservation of the natural environment of Botswana. – Acts as a repository for information on all aspects of the wildlife industry and disseminate such information to interested and affected stakeholders.
BirdLife Botswana	– Official "Birdlife International" representative for Botswana; – Aims to conserve species, sites and habitats so as to: ▪ Prevent the extinction of any bird species in the wild ▪ Maintain and where possible improve the conservation status of all bird species ▪ Conserve and where possible improve and enlarge sites and habitats important for birds ▪ Integrate bird conservation into sustaining people's livelihoods
Kalahari Conservation Society (KCS)	– The oldest environmental Non-Governmental Organisation (NGO) in Botswana (formed in 1981); – Promoting the knowledge of Botswana's rich wildlife resources and its environment through education and publicity; – Facilitating, coordinating and financing research into issues affecting natural resources and their conservation; and – Promoting, supporting and implementing wildlife conservation policies.

Okavango Research Institute (ORI) University of Botswana	– Stimulates environmental awareness through scientific and educational activities for residents and visitors in Northern Botswana. – Conducts independent, objective research, and provides information service to the public sector and civil society.
Elephants Without Borders (EWB)	Based in Kazungula, EWB is the country's leading regional cross-border research project focused on elephant conservation and management

2.5 TOURISM IN AREAS ADJOINING CH/12

Tourism in the Chobe Region

2.5.1 Northern Botswana serves as the main nature and wildlife-based tourism destination in Botswana. The Chobe and Ngamiland districts are the heart of Botswana's wildlife-based tourism industry. Maun and Kasane are located in close proximity to the unique natural features supporting large wildlife populations and scenic beauty that attracts thousands of nature-based tourists each year. Maun provides access to the Okavango Delta while Kasane provides access to the Chobe National Park and other surrounding area. The non-consumptive tourism industry provides accommodation for clients in exclusive lodges and camps and in campsites. Kasane, Kazugula, Lesoma, and Pandamatenga have accommodation facilities such as lodges, guesthouses and campsites. The Chobe District also has an international airport (Kasane International Airport) which serves tourism facilities in the district and the region. Some of the international tourism clients to CH/12 use Kasane International Airport as the main airport for arrivals and departures. In addition to air transport, Kasane is also linked to the neighboring countries of Namibia, Zambia and Zimbabwe through a tarred road network.

2.5.2 Tourism activities offered in the Chobe region include the following:

(i) Safari hunting: Safari hunting is carried out outside protected areas (i.e. outside the Chobe National Park). It is carried out in CBNRM areas belonging to KALEPA Trust, CECT and other private concession areas such as CH/12;

(ii) Game drives: This is the most common activity being undertaken, with almost every safari operation offering this activity whether it is camp based or a mobile operator;

(iii) Scenic flights: This activity seem to be growing in popularity and includes game flights over the delta;

(iv) Motor boat cruises: Boat cruises are also offered in the Chobe River. This activity makes use of a large number of small motor boats.

(v) Walking safaris: There is a limited amount of walking safaris in the Chobe area, particularly in the Linyanti area. Informal walks in the various camps and lodges accounts for the largest use of this tourist activity.

(vi) Sport fishing: Fishing trips are undertaken in the Chobe River.

2.5.3 Data from the Department of Tourism (2013) shows that the Chobe Region has 37 accommodation facilities with a total of 630 rooms and 1289 beds (Table 2.2). Some of the large accommodation facilities in Kasane are Mowana Lodge (with 114 rooms, 228 beds), Chobe Safari Lodge (81 rooms, 192 beds) and Chobe Marina Lodge (60 rooms, 132 beds). Chobe Game Lodge is located 15 kilometers from Kasane in the Chobe National Park and is also one of the roomy accommodation facilities in the area. It has a total of 48 rooms and 88 beds.

Table 2.2: Accommodation Facilities in the Chobe District

Category of Facility	No in each Category	No of Rooms	No of Beds
A*	26	522	1075
B**	11	108	214
Totals	**37**	**630**	**1289**

* *Licensed Accommodation Facilities such as hotels, motels, guesthouses including corporate guesthouses, bed & breakfast, self-catering apartments, backpackers tourist accommodation, campsites outside protected areas, including operations that offer such accommodation facilities on a timeshare bases*

***Licensed operations such as photographic/hunting camps and lodges, public camping sites or caravan sites that offer game drives or outdoor activities within wildlife management areas and protected areas, including operations that offer such accommodation facilities on a timeshare bases*

2.5.4 As already mentioned, the nearest village to CH/12 is Pandamatenga which is located along the Nata- Kazungula Road. Pandamatenga forms a transit zone between Kasane in the north-east and Nata in the east through a tarmac road. It also provides a link to Nata and other wildlife areas such as the Makgadikgadi and Nxai Pans National Park. Pandamatenga area has a total of three accommodation facilities namely: Camp Kazuma, Panda Rest Camp and Touch of Africa. Touch of Africa has a total of 10 rooms and 20 beds, Panda Rest Camp has a total of 10 rooms and 10 beds and Camp Kazuma has 5 rooms and 10 beds. Pandamatenga therefore has a total of 21 rooms and 40 beds.

2.5.5 Nata is located in the Central District and has about eight accommodation facilities which provide accommodation services to transit tourists across the KAZA region.

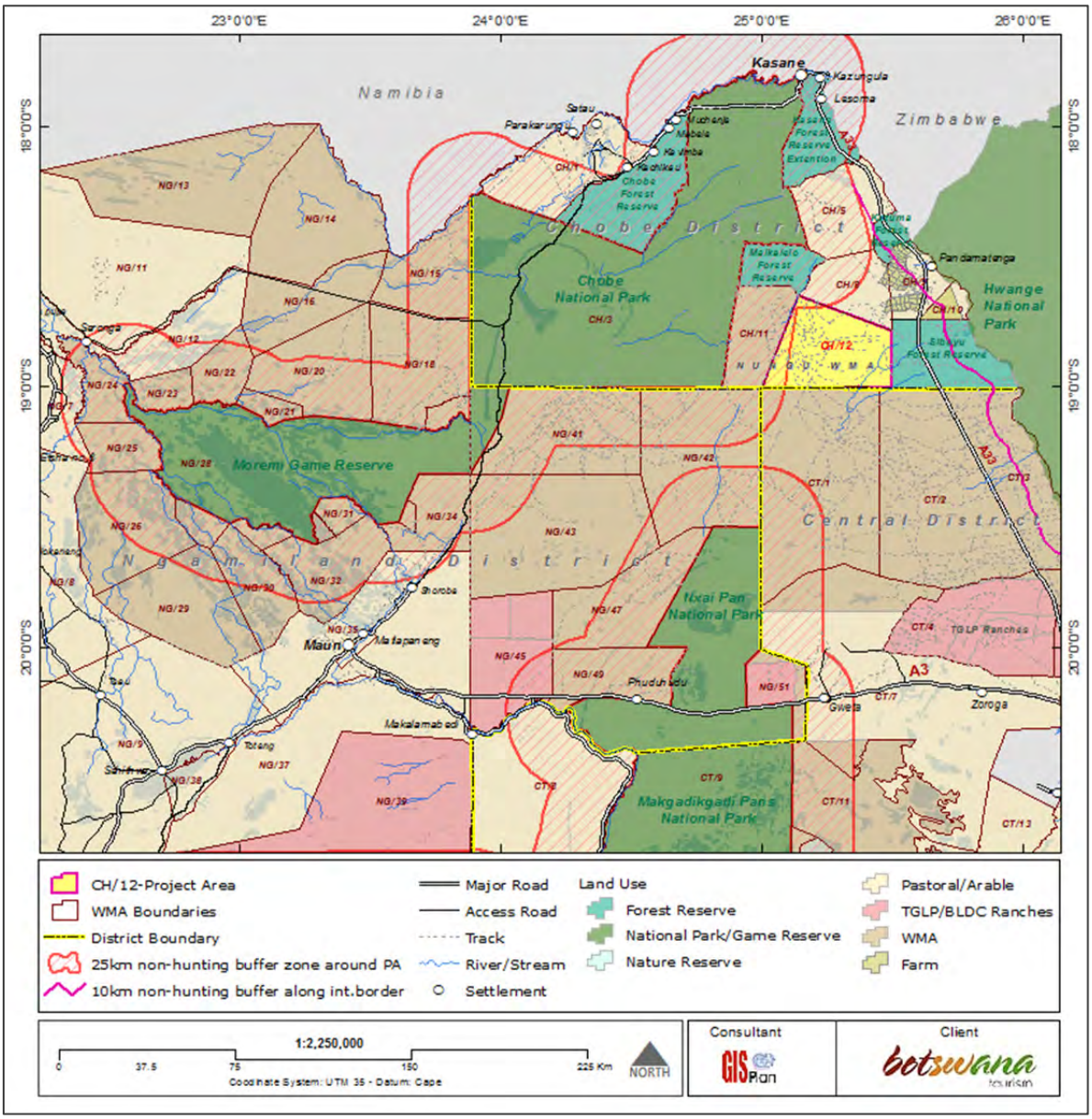
Tourism Development at Hwange National Park

2.5.6 Although located in Zimbabwe, Hwange National Park (HNP) has a significant influence in animal populations and tourism development at CH/12. The Hwange National Park is located east of the CH/12 and provides a link with Northern Botswana's migratory wildlife populations, notably elephants. Elephants from Hwange National Park are an important tourism product in that they migrate to ecologically important habitats such as the Chobe National Park, Okavango Delta and Makgadikgadi and Nxai Pans National Park.

2.5.7 Hwange is Zimbabwe's largest national park approximately 14 650 km^2 boasting large populations of wildlife. The park was developed in the 1920s. At establishment, the only perennial surface water sources available in Hwange were pools at Deka River. To increase the resident wildlife populations, boreholes were drilled to provide water to selected seasonal pans. This led to an increase in population sizes of elephant, buffalo, and zebra, although these declined when diesel pumps malfunctioned in the dry season of 1994. Ultimately, 57 boreholes were operational within 14000 km^2 in the main tourist regions. Some dams were also constructed on seasonal rivers in the north. Currently, tourism at Hwange National Park is reported to be doing well despite the economic hardships Zimbabwe has faced in recent years.

2.6 PROTECTED AREAS ADJACENT TO CH/12 AND LINKAGES

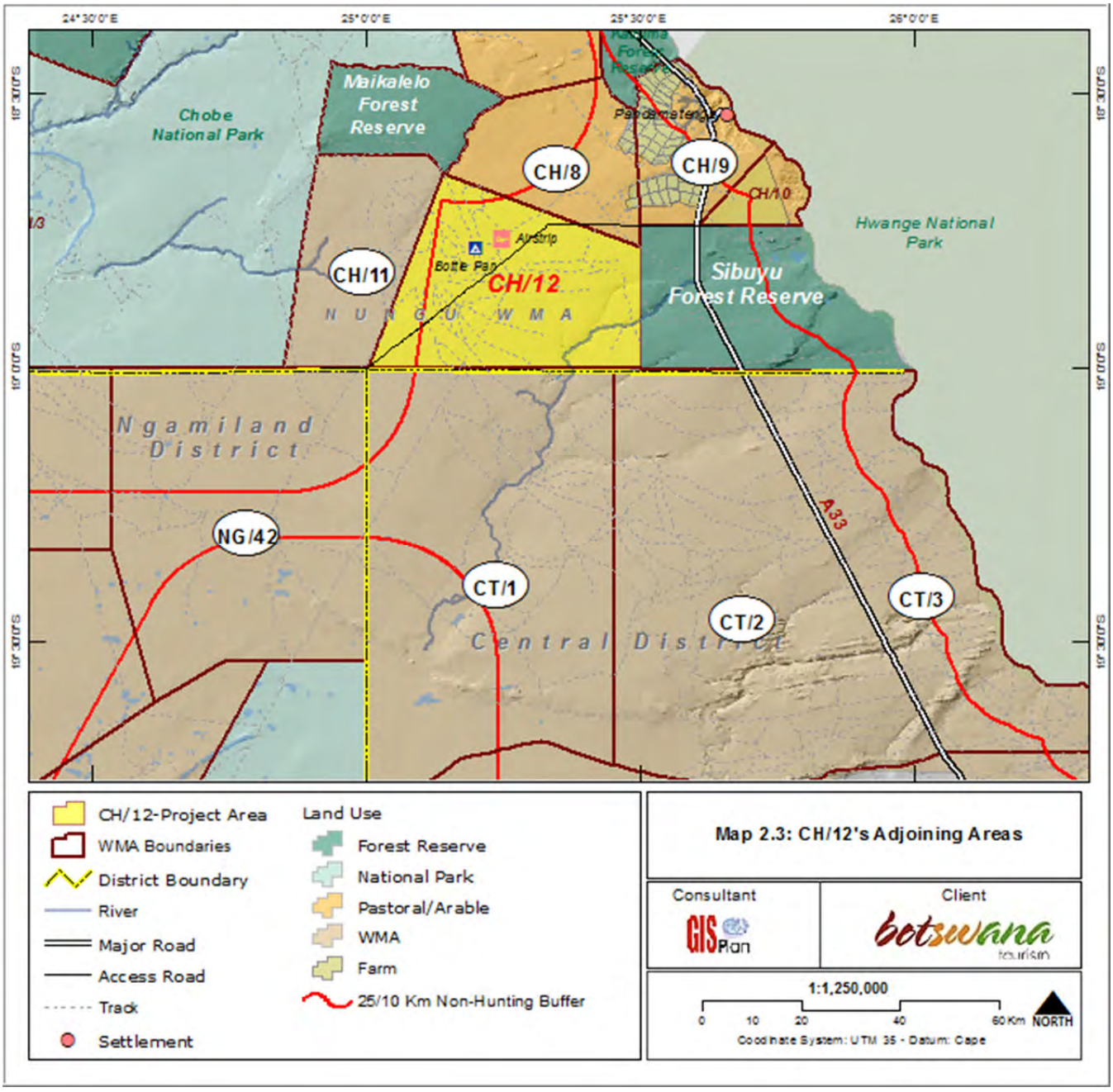
2.6.1 CH/12 and its surrounds are part of the Wildlife Management Areas (WMA) system that provides critical landscape's connectivity in linking protected areas in the northern Botswana. As Illustrated in Map 2.2 below, CH/12 is part of the Nunga Wildlife Management Area (WMA), which together with the neighboring Nata State Land and the Ngamiland State Land WMAs, provides linkages between Chobe National Park (CH/3), Makgadikgadi and Nxai Pans National Park (NG/50), Moremi Game Reserve (NG/28) and Hwange National Park in Zimbabwe. These linkages include the provision of a critically important wet season dispersal area that alleviate herbivore pressure on the dry season refuges of the Okavango Delta and Chobe/Linyanti River system, as well as the boreholes of Hwange National Park. This combination of wet and dry forage areas, annual movement patterns and linkages between the protected areas allows for the protection and management of one of Africa's largest contiguous wildlife populations. This region holds the single, largest remaining free ranging elephant population. As such it embodies a good measure of the pristine nature of the ecosystem, as well as the informed foresight of conservation authorities in the region.



Map 2.2: Regional View of Protected Areas in Northern Botswana

2.7 STATUS OF CH/12'S ADJOINING AREAS

2.7.1 Table 2.3 summarises the status and ecotourism potential of the concession areas adjoining CH/12.



Map 2.3: Area adjoining CH/12

Table 2.3: Ecotourism potential and activities in CHAs adjacent to CH/12

Name	Setting/Status/Recommendations
CT/1	– The concession area is considered suitable for use as a non-consumptive tourism concession. – Future tourism practices that can be carried out in the area should be aimed at the mid-market segment of the tourism market – Semi-permanent facilities to be developed include two tented lodges/camps with a maximum of 20-beds each;
CT/2	– The concession is considered suitable for use as a non-consumptive tourism concession. – Future tourism practices that can be carried out in the area should be aimed at the mid-market segment of the tourism market – Facilities to be developed include two tented lodges/camps with a maximum of 16-beds each.
Sibuyu Forest Reserve	– As the Reserve is located on a wildlife migration route, hunting is considered to be less suitable and "non-consumptive" ecotourism in the form of game drives and camping are recommended by the Botswana Guidelines for Utilization of Forest Reserves for Ecotourism Activities
CH/11	– The area abuts the Chobe National Park within 25 km non-hunting buffer. It is, therefore, considered suitable for non-consumptive tourism use only.
NG/42	– The concession is considered suitable for wildlife based photographic tourism either using camp or mobile operations. – Facilities to be developed include: (a) two (2) semi-permanent lodges/camps with a maximum of 24 beds per lodge/camp; (b) one (1) remote camping ground with a total capacity of 30 individuals located in 3 sites (c) three (3) wilderness camp grounds for registered mobile operators. Each wilderness camp ground shall have a maximum capacity of 15 people
CH/8	– Currently used by KALEPA Trust mainly for hunting safaris – Almost half of the concession area lies within 25 km non-hunting buffer zone around Chobe National Park
Maikaelelo Forest Reserve	– Assessed as area with medium potential for ecotourism development because of its remoteness and limited accessibility. – Envisaged to work as a buffer zone between the CNP and communal areas. As per Botswana guidelines for utilization of forest reserves for ecotourism activities, it is recommended that the reserve should specialize in non-consumptive/photographic tourism.

Legislative, Policy and Planning Framework

CHAPTER 3: LEGISLATIVE, POLICY AND PLANNING FRAMEWORK

3.1 INTRODUCTION

3.1.1 In the development of a Tourism Management Plan for CH/12 cognisance has been taken of the provisions of relevant international conventions, protocols, and other international agreements and instruments to which Botswana is a signatory. CH/12 has a diversity of natural resources in the form of fauna and flora that must be protected from potentially adverse tourist activities. It is for this reason that these activities are monitored and regulated by the provisions of relevant International Conventions, Regional Protocols, National Policies and Acts.

3.1.2 This chapter examines the international, regional and national legislative and policy frameworks within which the Tourism Management Plan for CH/12 is being developed, and contextualises the relevance of the provisions of these legislative instruments in regulating activities and the use of natural resources in WMAs and the Concession Areas in general, and in CH/12 in particular.

3.2 RELEVANT INTERNATIONAL CONVENTIONS AND PROTOCOLS

3.2.1 The international conventions and protocols to which Botswana is signatory (Table 3.1), carry with them binding obligations on the part of the contracting states. The provisions of these conventions and protocols should therefore guide the management prescriptions for CH/12 and the use of its natural resources.

Table 3.1: International Conventions with Relevance to the Development of a Tourism Management Plan for CH/12

Conventions	Objectives & Relevance
Agenda 21- Global Action Programme Year: 1992	This is an action plan of the United Nations (UN) related to sustainable development and was an outcome of the United Nations Conference on Environment and Development (UNCED) held in Rio de Janeiro, Brazil, in 1992. It is a comprehensive blueprint of action to be taken globally, nationally and locally by organizations of the UN, governments, and major groups in every area in which humans directly affect the environment. In this regard, it carries profound relevance to an environment such as CH/12 where human activities may directly affect the environment. It is considered note-worthy that Botswana has, in line with principles 16 and 17 of Agenda 21, prepared and approved a National Policy on Natural Resources Conservation and Development which calls for a comprehensive evaluation of all the economic, social and environmental implications of major policies, programmes and projects before they are implemented, to foster sustainable development. With regard to mainstreaming environmental costs in economic decisions, the system of Environmental Impact Assessment is legislated for and provides for Strategic Environmental Assessment (SEA).
Convention on International Trade in Endangered Species of Fauna and Flora (CITES) Botswana ratified the convention in 1978	The objective of this convention is to monitor and control international trading of endangered species of flora and fauna. This is particularly relevant to CH/12, since it is endowed with a variety of flora and fauna, some of which are endangered species. The Ministry of Commerce, Trade and Industry, as well as the Ministry of Environment, Wildlife and Tourism, (Department of Wildlife and National Parks) are charged with the responsibility of administering this convention. A major "limitation" of this Convention is that it does not allow for local variations to the global restrictions hence Botswana is grappling with a huge elephant population problem, particularly in the Okavango Delta, and Chobe Riverfront. On the positive side, the Convention provides for the protection of flora and fauna as components of ecosystems, especially where they are threatened by trade. Botswana is signatory to CITES and all the CITES provisions have been fully integrated into national law in 1992 (Fifth Schedule of the Wildlife Conservation and National Parks Act).

Conventions	Objectives & Relevance
United Nations Convention On Biological Diversity (CBD) Botswana ratified the convention in 1977	This convention aims at the conservation of biological diversity and the promotion of the sustainable use of its components. With the great amount of bio-diversity in the project area, the relevance of the provisions of this convention to the preparation of a management plan for the area cannot be over emphasized. Institutional responsibility for the implementation of this convention lies with the Department of Environmental Affairs in the Ministry of Environment, Wildlife and Tourism. The CBD promotes the Ecosystem Approach as the best way to achieve sustainable management of resources. The ecosystem approach provides an integrated approach to the management of land, water and living resources for the conservation and sustainable use of biodiversity. The Ecosystem Approach is integral to the development of the Tourism Management Plan for CH/12.
United Nations Framework for Convention on Climate Change (UNFCCC) Botswana ratified the convention in 1994	The Convention on Climate Change sets an overall framework for intergovernmental efforts to tackle the challenge posed by climate change, such as global warming and greenhouse gas emissions. Signatories to the Convention, of which Botswana is one, are obliged to develop programmes aimed at reducing emissions and to take measures that alleviate the effects of droughts and other consequences of climate change. The relevance of this convention to the development of a Management Plan for CH/12 lies in the fact that the area is prone to droughts and measures must be taken to reduce its effects. Artificial water provision for wildlife in CH/12 is a key management intervention with diverse implications for the natural resource base in the area, particularly under climate change regimes. The Department of Metrological Services is the Botswana focal point for UNFCCC.
The African Convention on the Conservation of Nature and Natural Resources Botswana signed the convention in 1968	The objectives of this Convention are to enhance environmental protection; to foster the conservation and sustainable use of natural resources; and harmonise and coordinate policies in these fields. One of the key obligations of the signatories to this convention is to ensure that the conservation, utilisation and management of natural resources is treated as an integral part of national or local development plans. This provision of this convention are relevant to the development of a management plan for CH/12 since the area has natural resources that must be conserved and sustainably utilised.
United Nations Convention to Combat Desertification Botswana signed the convention in 1995 and ratified it in 1996	Sustainable land management for adaptation to climate change is the underlying theme of this convention, as well as the mitigation of droughts in countries experiencing serious droughts. The convention therefore obliges countries to adopt an integrated approach towards combating drought and desertification. The relevance of the provisions of this convention in the development of the Tourism Management Plan for CH/12 lies in the fact that Botswana, and by extension, CH/12, experiences frequent cycles of drought, which require that appropriate measures be put in place to combat its effects. This has implications for artificial water provision and its likely impacts on plant-herbivore interactions, and the general physical environment.

3.3 REGIONAL AGREEMENTS AND PROTOCOLS WITH RELEVANCE TO THE DEVELOPMENT OF A TOURISM MANAGEMENT PLAN FOR CH/12

3.3.1 The regional context in this case is taken to be the Southern Africa sub region. The regional agreements and protocols are mostly those between member states of the Southern Africa Development Community (SADC), of which Botswana is a member state. A set of obligations attach to countries which have ratified these agreements and protocols, and these obligations are designed to help achieve the objectives of the protocols. Regional Agreements and protocols to which Botswana is a signatory, and which have relevance in the development of a Tourism Management Plan for CH/12 are presented in Table 3.2 below.

Table 3.2: Regional Agreements and Protocols with Relevance to the Development of a Tourism Management Plan for CH/12

Agreement/Protocols	Objectives & Relevance
SADC Protocol on Development of Tourism Botswana signed the Protocol in 1992 and ratified it in 1998	The objectives of the protocol are to use tourism as a vehicle to achieve sustainable social and economic development, and to ensure equitable, balanced and complementary development of the tourism industry region – wide. CH/12 is in Botswana which is a SADC member state and should be offered as a regional tourism product, hence the relevance of the provisions of the protocol. The KAZA TFCA, initiative within which CH/12 falls, is testimony to this.
SADC Protocol on Wildlife Conservation and Law Enforcement Year: 2003	The main objective of the protocol is to establish common approaches to the conservation and sustainable use of wildlife resources and to assist with the effective enforcement of laws governing those resources. CH/12 has wildlife resources and falls within the KAZA TFCA; hence there is immediate relevance of adhering to the aims and objectives of the protocol in conserving and managing wildlife resources in the concession area.
SADC Protocol on Forestry	The major objectives of the protocol are to promote the development, conservation, sustainable management and utilisation of all types of forests and trees; to promote trade in forest products throughout the region; and to achieve effective protection of environment and safeguard the interests of both the present and future generations. The relevance of this protocol to the development of a Tourism Management Plan for CH/12 lies in the fact that there are forest resources in and around CH/12 that need to be conserved and utilised sustainably.

3.4 NATIONAL POLICY FRAMEWORK

3.4.1 Botswana has in place a diverse range of policy and strategy documents which give direction and guidelines for the sustainable development of various sectors. This section of the Report identifies those national policies and strategy documents which have relevance to the development of a Tourism Management Plan for CH/12. These are as shown in Table 3.3.

Table 3.3: National Policies and Strategies with Relevance to the Development of the Tourism Management Plan for CH/12

National Policies	Objectives & Relevance
National Policy On Natural Resources Conservation and Development Year: 1990	The primary goals of the National Policy on Natural Resources Conservation and Development are to increase the efficiency of natural resource use to reduce negative impacts, and to integrate the work of sectoral ministries and other interest groups. More specifically the policy aims at optimizing existing uses of natural resources, diversifying the rural economy to generate more jobs, and increasing the participation of civil society in managing the environment. This policy focuses on ways and means of addressing pressures on water resources, water pollution, rangeland conditions, maintaining the value of ecosystems, and tourism development amongst others. These aspirations find immediate relevance for the development of a Tourism Management Plan for CH/12 given the necessary management interventions introduced in the area such as ground water abstraction for maintaining artificial water sources in the concession area. The responsible institution for its implementation is the Department of Environmental Affairs (DEA).

National Policies	Objectives & Relevance
National Forest Policy Year: 2011	The Forest Policy is a guiding framework that facilitates the management of forests and range resources of the country through conservation, development, and sustainable use. The Policy defines basic principles, objectives, strategies and action plans for the management of forests and range resources, as well as strategies for developing and implementing comprehensive wild-land fire management plans. It represents statements of intent that the Government sets out as part of its overall vision for forestry. The Policy emphasizes the maintenance of natural diversity, protective and productive capacity, scientific, cultural and aesthetic values of forest resources. It is thus concerned with the manner in which forests should be managed to serve societal demands for goods and the non-material values that are inherent in forests. The Forest Policy recognizes the diversity of interests related to forests conservation and utilization, and the need to involve all stakeholders in forest management and decision making. Accordingly, the Policy seeks to direct, facilitate and regulate the actions of all players in the sector. CH/12 is endowed with a diversity of forest and range resources and this policy can go a long way in guiding the development of a Tourism Management Plan for the concession area.
National Energy Policy Year: 2006	The National Energy Policy of 2006 aims at providing a least cost mix of energy supply to Botswana. The energy policy objectives are mainly that: - Energy users should have access to appropriate and affordable energy services; - Energy should be used efficiently; - The energy supply industry should be economically sustainable and efficient; - All users should have security in their access to energy; - Energy extraction, production, transport and use should not damage the environment or people‘s health and safety; and - In the long term, sustainable energy usage needs to be implemented. The Energy Policy places emphasis on developing new and renewable sources of energy as alternatives or complementary supplies of affordable and sustainable sources of energy. The future leaseholders of CH/12 should ensure that energy provision to their facilities is sustainable and environmentally friendly, in line with the policy objectives. Most of the lodges and camps in Botswana especially those in wilderness areas use diesel generated electricity. It is against this background that renewable energy options should be given attention when developing a Management Plan for CH/12.
National Biodiversity Strategy and Action Plan (NBSAP) Year: 2004	The goal of the strategy and action plan is to ensure the long-term health of Botswana’s ecosystems and components, and to encourage sustainable and wise use of resources through the provision of a framework of specific activities designed to improve the way biodiversity is perceived, utilised and conserved. Given the fact that the Chobe District, wherein CH/12 rests, is one of the major biodiversity hotspot nationally, the relevance of the Strategy to carefully reconciling biodiversity conservation objectives, and tourism development in CH/12, cannot be over-emphasized.
The Wildlife Conservation Policy Year: 1986 (under review)	The Wildlife Conservation Policy of 1986 governs the sustainable utilisation of wildlife resources, as well as the conservation thereof. The policy should be read in conjunction with the Wildlife Conservation and National Parks Act of 1992, which provides for the conservation and management of wildlife in Botswana and gives effect to CITES and any other international conventions to which Botswana is party to. It also provides for the establishment and management of national parks and game reserves, wildlife management areas, controlled hunting areas and other matters connected therewith. Apart from the scenic beauty of CH/12, resident and migratory wildlife populations in CH/12 form a major component of the natural resource base for conservation and tourism development. As such, the provisions of this Policy are crucial in guiding the development of a Management Plan for the concession area.

National Policies	Objectives & Relevance
The Botswana National Ecotourism Strategy (NES) Year: 2002	The goal of the NES is to create an environment in which all elements of tourism development planning and management facilitate, promote and reward adherence to the key guiding 'principles' of ecotourism by all of those involved in the tourism industry. These include the following: – Minimizing negative social, cultural and environmental impacts. – Maximizing the involvement in, and the equitable distribution of economic benefits to, host communities and citizen entrepreneurs. – Maximizing revenues for re-investment in conservation. – Educating both visitors and local people on the importance of conserving natural and cultural resources. – Delivering a quality experience for tourists so that there will be sustainable benefits to conservation and development). It is therefore important that environmental and tourism management in CH/12 adhere to these principles. While NES promotes local community-based tourism development or ecotourism, the challenge for CH/12 is that it is located in an area which is currently not easily accessible to local communities in the Chobe District. But with further national development initiatives in the Pandamatenga area, notably agriculture, this strategy will even be more relevant.
Botswana Tourism Master Plan Year: 2000	This Master Plan serves as a basic guideline for development of tourism in Botswana and recognizes that there are four main drivers of tourism development in Botswana. These are: (a) product diversification; (b) citizen / community participation /community empowerment; (c) private / public sector partnership; and (d) ecological / economic sustainability. In this regard, the plan recommends a modified strategy of "*high volume - mixed prices*" strategy in addition to the "high cost low-volume" strategy. The Plan also recommends Eco-certification in Botswana which is meant to encourage and support responsible environmental, social and cultural behaviour by tourism businesses. Finally, the Tourism Master Plan calls for the establishment of the Tourism Board (now the Botswana Tourism Organization) and a Tourism Development Fund. The Tourism Master Plan serves as a basic guideline for development of a Tourism Management Plan in CH/12.
Tourism Policy Year: 1990 (under review)	The policy provides guidelines for planning, developing and managing tourism in Botswana. It is designed to ensure that tourism activities are carried out on an ecologically sustainable basis. The objectives of the Tourism policy are to: – Increase foreign exchange earnings and government revenues and generate employment in rural areas – Promote rural development and the provision of services in remote areas – Improve the quality of life by providing recreational opportunities; and to – Establish a favorable national image to the outside world. The Tourism Policy advocates a "high cost - low volume" tourism approach. This approach encourages operators to charge high fees to moderate tourist access to environmentally-sensitive areas. This approach, it is assumed, will engender environmental conservation while promoting tourism development in areas such as CH/12.
National Action Plan to Combat Desertification Year: 1977	The National Action Plan to Combat Desertification was developed as a means of meeting the obligations of Botswana under the UN Convention to Combat Desertification. The Plan outlined strategies and activities to be undertaken in this regard. These amongst others are aimed at improving drought preparedness in the whole country. For CH/12, these stipulations would be critical in striking informed common ground between groundwater abstraction, artificial water point provision, concentrated wildlife populations, and impacts on biodiversity and its habitats, particularly during the dry season and during drought spells.

National Policies	Objectives & Relevance
Waste Water and Sanitation Policy Year: 2001	The overall purpose of the Policy is stated as: "To promote the health and well-being of the people of Botswana through provision of appropriate and sustainable wastewater/sanitation management and to introduce mechanisms for the protection and conservation of water resources". The specific objectives of the Waste Water & Sanitation Policy are: (a) To provide the framework for the development of affordable and sustainable wastewater / sanitation infrastructure and management; (b) To protect and improve public health and prevent pollution of natural water resources; (c) To conserve water resources. Compliance to this Policy is critical given the current status of waste water management in tourist accommodation facilities in some tourism areas of Botswana. Since tourism facilities generate liquid, solid and clinical waste, the incorporation of the policy's prescriptions into the Tourism Management Plan for CH/12 will go a long way in addressing waste management in the concession area.
Final Draft Wildlife Management Regulations Year: 2010	A Final Draft Wildlife Management Regulations was prepared in September 2010. Though not yet finally approved, its contents, particularly the First Schedule, gave an indication of what shall be included in the Management Plan for each Wildlife Management Plan Area (WMA) in terms of contents and requirements. These regulations will serve as a useful guide and give direction in the development of the Management Plan for CH/12. Suffice to note that final guidelines for the development of WMA Management Plans and the development of Concession Areas Management Plans, were prepared by Biokavango Project in 2009. These guidelines are applicable in the development of a Management Plan for CH/12 as well.

3.5 NATIONAL LEGISLATIVE FRAMEWORK

3.5.1 Table 3.4 shows some existing national legislative instruments that are directly or indirectly relevant to the development of a Tourism Management Plan for CH/12.

Table 3.4: National Legislative Framework within which the Tourism Management Plan for CH/12 is Being Developed

Legislative Instrument	Objective and Relevance
Agricultural Resources (conservation) Act Cap.35:06 of 1973	The Act provides for the conservation of Botswana's agricultural resources, which the Act defines as animals, birds, plants, soils, vegetation and veldt products, etc. CH/12 hosts most of resources; hence the Act is relevant and applicable to the development of the Tourism management Plan for CH/12. The Act is administered by the Agricultural Resources Board in the Ministry of Agriculture.
Tribal Land Act Cap.32:02 of 1970	Applies to all tribal/communal land in the country. It empowers the Land Boards to designate land use zones, and determine land management plans for the various land use zones and how they should develop. This Act is of particular importance to Chobe Land Board as the main implementation authority of the Land use and Land Management Plans. The Act should be applied and enforced if the objectives of the plan are to be fully achieved and realized. Chobe Land Board, in conjunction with BTO, is the main client for the development of a Tourism Management Plan for CH/12.
Botswana Tourism Organisation Regulations Year: 2010	The BTO Regulations provide for the regulation of the tourism industry through issuing of grading certificates, providing conditions for grading, dealing with applications for renewal of grading certificates and applications for amendment of grading. It therefore follows that accommodation facilities in CH/12 will have to comply with the requirements for grading, for them to be provided with grading stars and to be permitted to operate.

Legislative Instrument	Objective and Relevance
Botswana Tourism Organisation Act Act No.14 of 2009	The Act makes provision for the establishment of Botswana Tourism Organization (BTO), a Board of Directors, and the regulation of the tourist industry with a view of: – Promoting tourism development and well-being; – Grading tourist enterprises and conducting tourism awareness campaigns and tourism research – Marketing and promoting the establishment of enterprise ventures between citizen and foreign investors – Collaborating with local communities and non-governmental organizations in promoting sustainable tourism. This Act repealed the Botswana Tourism Board Act. The Act highlights the management role of BTO in the tourist industry of Botswana. BTO is instrumental in coordinating the development of the Tourism Management Plan for CH/12 and will continue to dispense its regulatory functions as per the BTO Act and BTO Regulations.
Environmental Assessment Act of 2010	Government adopted the Environmental Assessment (EA) Act in 2010 to repeal the 2005 EIA Act. The Act calls for an environmental impact assessment to be carried out to assess the potential effects of planned developmental activities. While this is the case, key objectives of the Act include the following: – To determine and to provide mitigation measures for effects of such activities as may have a significant adverse effect on the environment; – To put in place a monitoring process and evaluation of the environmental impacts of implemented activities. The EA Act of 2010 came into force in 2012. The EA Act of 2010 has provisions similar to the EIA Act of 2005, the main difference between the two being the provision in the EA Act of 2010 for the establishment of a Board. The Board's functions under the new Act are to register environmental practitioners and provide quality assurance regarding practitioners appointed to conduct environmental assessments. In the event that an environmental assessment is required for new developments within CH/12, the new leaseholder should ensure that environmental assessments are carried out by a practitioner that is registered with the Board. Environmental and ecological monitoring protocols will have to be incorporated within the Tourism Management Plan for CH/12, in consonance with the dictates of Adaptive Management protocols.
EIA Regulations of 2011	These regulations are aimed at regulating EIA practitioners, in terms of who is qualified to conduct EIAs. The regulations also provide a code of conduct for EIA practitioners. This is relevant to CH/12 in the sense that EIA's might be required, so it is important that qualified practitioners carry out such EIAs. To be dependable in the context of Adpative Management, environmental and ecological monitoring will also have to be conducted by qualified practitioners.
Herbage Preservation Act (Prevention of Fires) CAP.38:02 of 1978	This is the legal framework administering the management of fire in Botswana. This Act is relevant in the sense that fire is a critical factor in the functioning of ecosystems in Botswana, and by implication that of CH/12. The Act provides a well-structured set of rules for an integrated Fire Management System in Botswana, which should also be adapted and applied in the concession area.
Tourism Act of 2009 Year: 2009	The Act provides for licensing and regulating the tourist industry with a view of promoting its development and sustainability. The Act provides for the following: (a) establishment of the Tourism Industry Licensing Committee; (b) Licensing and classification of tourist enterprises; (c) Reservation of certain tourism licenses for citizens; and for the (d) observation of safety and sanitation in tourism enterprises. The provisions of the Act very much applies to CH/12 in the sense that there is a presence of the tourism industry in the area, whose activities need to be properly regulated in order to sustainably utilise the very resources that attract tourists. The Department of Tourism administers the Act.

Legislative Instrument	Objective and Relevance
Tourism Regulations Year: 1996	The Tourism Regulations provide the criteria for licensing of tourist enterprises, their classification and standards to be met in terms of safety and sanitation in tourist facilities. These regulations are of particular relevance to CH/12, given the fact that tourist accommodation facilities and related infrastructure will be established in the concession area, which need to be graded and licensed.
Water Act CAP.34:01 of 1996)	The Water Act provides the legislative framework for water management in Botswana. The Act established the Water Apportionment Board as the licensing authority. The following stipulations are enshrined within the Water Act: - The status of public water - The inherent rights of individuals to the use of water - The recording, granting, variation, and termination of formal rights to use or impound water or to discharge effluents into it - The obligations of those taking water, to use it properly - Conditions controlling pollution of public water. This Act is important in the sense that it defines ownership, rights, and use of public water. It also prohibits the pollution, fouling or poisoning or interference with or alteration of the flow of public water. The responsibility of administering this Act lies with the Department of Water Affairs (DWA). This Act locates relevance in the development of a Tourism Management Plan for CH/12 since there will be abstraction of groundwater for both wildlife and public use.
Wildlife Conservation and National Parks Act (Cap 38:01) Act No.28 of 1992	The Act provides for the gazetting of National Parks, Game Reserves and Wildlife Management Areas (WMAs), in which wildlife conservation and use is the primary land use. This Act is significantly important and relevant to CH/12, given the presence of diverse wildlife resources in the concession area. The provisions of the Act will greatly inform recommendations and guidelines put forward by the Tourism Management Plan for CH/12. The Act is administered by the Department of Wildlife and National Parks (DWNP).
Forest Act Cap. 38:03 Year: 1968	The Act makes provision for the better regulation and protection of forests and forest produce in Botswana and also provides for matters incidental thereto. This Act is relevant to Chobe District within which CH/12 lies, more so that there are Forest Reserves around CH/12, which should be protected. The Act is administered by Department of Forestry and Range Resources.
Waste Management Act Cap. 65:06 of 1998	This Act provides for the management and control of waste comprising clinical, commercial, household, hazardous and industrial waste. The Waste Management Act led to the establishment of the Department of Sanitation and Waste Management, known today as the Department of Waste Management and Pollution Control. The Act establishes a system for the registration and licensing of waste disposal carriers and facilities, introduced waste management plans, various enforcement powers and it also applies the Basel Convention in regulating the trans-boundary movement of hazardous waste. In compliance with the provisions of this Act, there is need to ensure that all the controlled waste that is generated by all development activities is disposed off in a registered waste management facility. There will be need to adhere to proper waste disposal methods to designated disposal facilities for the different types of waste that would be generated in CH/12.

3.6 POLICY AND LEGISLATIVE FRAMEWORK CHALLENGES

3.6.1 The Government of Botswana has made great strides in the development and implementation of various policies and legislations aimed at developing and regulating the tourism industry and ensuring that the industry operates in a manner that ensures the sustainable use of natural resources, protects the environment, and guarantees the safety and well-being of tourists. However a number of challenges do exist which militate against the efficient implementation/administration

of these policies and legislations, as well as the full achievements of the intended objectives. The challenges being experienced with regards to the existing legislative and policy framework as they relate to the regulation of the tourism industry, environmental management and issues of biodiversity and conservation of natural resources are summarized as follows:

(i) There is the issue of non-harmonisation of the provisions of the various pieces of legislations and policies. Many provisions of these legislations and policies often overlap, and in other cases, there are divergences in policy objectives and/or provisions dealing with the same sector. As a result, there are often confusions in the enforcement of the provisions of these legislations and policies amongst the various departments responsible for administering them;

(ii) In some cases, there is lack of adequate manpower in the departments responsible for administering the various legislations and policies to effectively enforce them;

(iii) There are a multiplicity of departments with responsibilities for administering the various legislations and policies, with minimal coordination of their different activities and efforts. This challenge underscores the need for an appropriate institutional framework with adequate coordination mechanisms to ensure that CH/12 is managed properly, with regards to sustainable tourism development.

3.7 RELEVANT MANAGEMENT PLANS OF HIGHER ORDER

3.7.1 In the development of Tourism Management Plan for CH/12, it is important not to lose sight of the importance and need to align the Management Plan for the area to relevant higher order plans. This is because lower order plans should be informed by and draw inspiration from higher order plans. In this regard, it is important that the recommendations, guidelines and prescriptions of the Tourism Management Plan for CH/12 be consistent with those of relevant higher order Management Plans. Consequently, the Chobe District Settlement Strategy of 2000 is a higher order plan that is deemed relevant to this study. Additionally, the District Development Plan, 7 (DDP 7) and the National Development Plan 10 (NDP10) are also considered as higher order plans which should inform the Tourism Management Plan for CH/12.

4

Biophysical Environment and Status of Biodiversity

CHAPTER 4: BIOPHYSICAL ENVIRONMENT AND STATUS OF BIODIVERSITY

4.1 CLIMATE

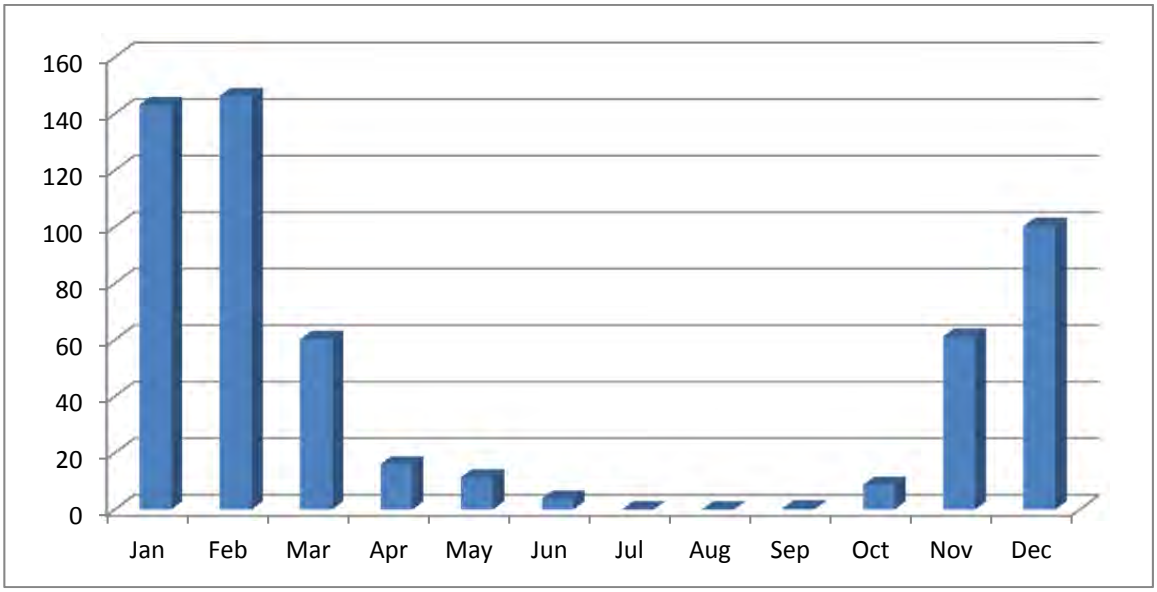
4.1.1 Aridity indices indicate that CH/12 is found in a dry and hot semi-arid steppe climate zone. Since the area's location is in the sub-tropical high pressure belt of southern hemisphere in the interior of Southern Africa, it is far away from oceanic influences, and therefore rainfall is relatively low and seasonal with high diurnal ranges of temperature. Over most of the region surrounding CH/12 the average annual water surplus is very low, as is reflected in the low mean surface runoff. The annual moisture deficit is very often greater than 400 mm.

4.1.2 Like elsewhere in Botswana the year is generally divided into two distinct seasons, namely dry and wet. During the wet season (November to April) a prolonged low-pressure system develops over the region, drawing in moist air from the surrounding land and oceans. In the dry season (May to October) low-pressure areas move northward and the influx of high-pressure leads to stable dry conditions. There is evidence that the climate of the southern African region (including CH/12) is also strongly influenced by the El Nino phenomenon. When this phenomenon is strong, it leads to drought conditions over the region, and when weak it brings periods of above average rainfall.

4.2 RAINFALL

4.2.1 CH/12 belongs to a region of summer rainfall with the mean annual rainfall value revolving around 550 mm and the coefficient of variation of about 30%. As illustrated in Figure 4.1, rainfall is highly seasonal with more than 90 per cent occurring between November and March. It occurs on a few isolated rainy days and in isolated locations, seldom exceeding 59 rain days per year. As illustrated in Figure 4.2 below, precipitation is most likely to happen around December to February. Precipitation is least likely around July/August, occurring in less than 1% of the days.

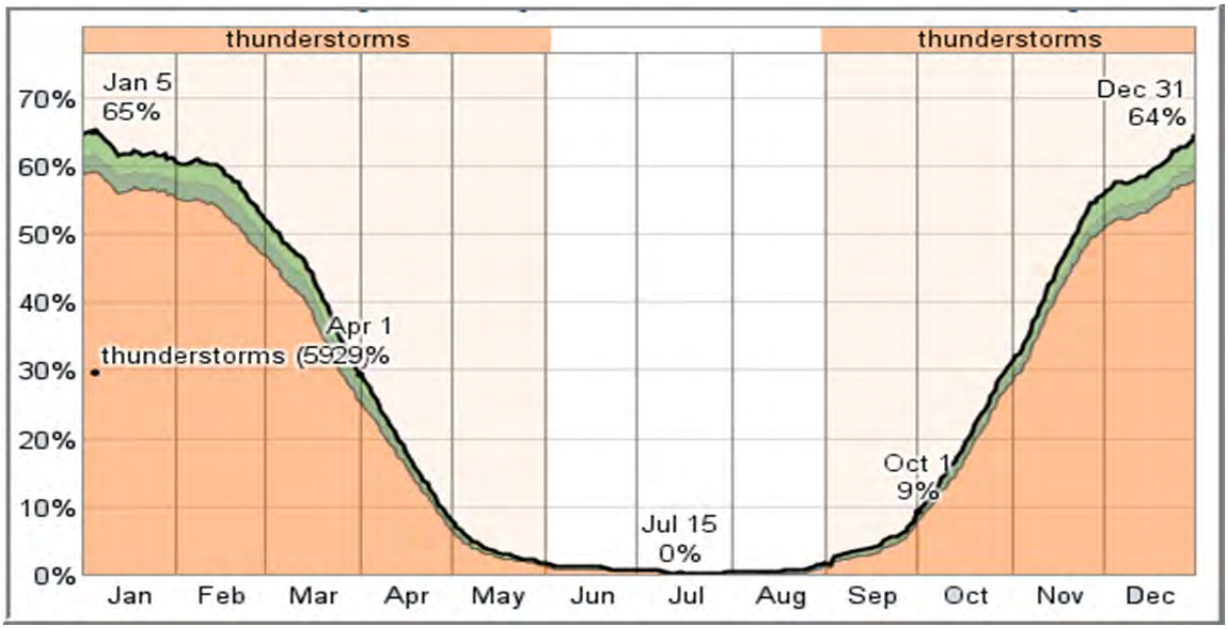
Figure 4.1: Monthly Average Precipitation for January 1996 - December 2011



Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	
143.1	146.2	60.2	16.0	11.4	3.7	0.0	0.0	0.4	8.6	61.2	100.2	[mm]
Average Precipitation for (January 1996 - December 2011) : **551.0 mm**												

Source: Data collected from the weather station located at Pandamatenga

Figure 4.2: Rainfall Probability for CH/12 Area; (based on records at the Pandamatenga weather station from January 1996 to December 2011)



4.2.2 Rainfall in the concession area is caused mainly by convection thunderstorms presenting more than 89% of common precipitation occurring in CH/12 and its surroundings. Thunderstorms typically occur as localized events. Based on the historical records at the Pandamatenga weather station they are most likely around January/February. Other common forms of precipitation recorded in the area include moderate (5%) and light rain (5%), as well as drizzle (1% of total rainy days).

4.2.3 Under average rainfall conditions the natural pans in the concession area will normally retain water from the beginning of the rainy season (usually November) up to the end of May. The above average rainfall years will yield water that can be retained for a longer period. In addition, it has also been reported that rainfall in CH/12 and its surroundings has to exceed a minimum threshold of at least 30 mm before any runoff could occur, owing to high temperatures, low humidity and mainly sandy and flat terrain. Many rainfall amounts are far less than 30 mm influencing the very ephemeral flow regimes of the Nunga River in the area. These attributes also result in high water storage requirements for natural pans and artificial water points in order to deliver the sufficient yields required for sustained wildlife use, particularly during the dry season.

4.3 EVAPORATION

4.3.1 As illustrated in Figure 4.3 the mean annual evapotranspiration in CH/12 is calculated to be in the range between 1912-1987 mm/year and even beyond. These results have shown that the open water evaporation rate can reach (and even exceed) the level of 2000 mm. These relatively high potential evapotranspiration levels mean that the soil dries up quickly and this reduces the amount of water available for plant uptake. This results in vegetation being more prone to drought.

4.3.2 Evaporation is highest during the rainy season, and it significantly reduces effective rainfall, runoff, soil infiltration and groundwater recharge. Evaporation loss from natural pans and artificial water points in the area is also significant. The natural pans in the area usually dry up at the end of the rainy season. Specifically, in a normal (average) rainfall year of close to 550 mm the natural pans will typically retain water until the end of May.

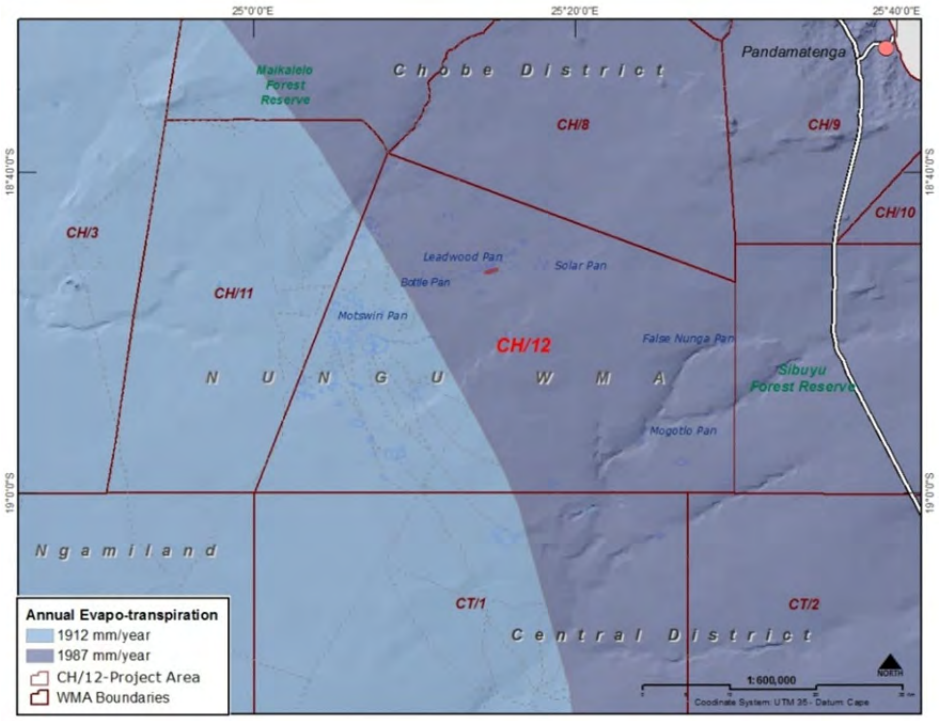


Figure 4.3: Distribution of Potential Evapotranspiration in the region surrounding CH/12

4.3.3 The aridity index calculated as the ratio of mean annual precipitation to mean potential evaporation has shown that CH/12 falls within the semi-arid category, indicating the considerable potential that inappropriate resource and land-use practices could lead to desertification.

4.4 TEMPERATURE PROFILE

4.4.1 Temperatures in CH/12 are typical of a semi-arid (continental) climate, with noticeable diurnal ranges. The maximum air temperature varies from a monthly mean of 25.4^{0}C in July to 35.1^{0}C in October with maximum temperature recorded being as high as 42^{0}C (Figure 4.4). Minimum temperatures range from a monthly mean of 10^{0}C in June to 21^{0}C in November. The hottest part of the year coincides with the period of highest precipitation while minimum temperatures in June and July may occasionally drop low enough to allow ground frosts.

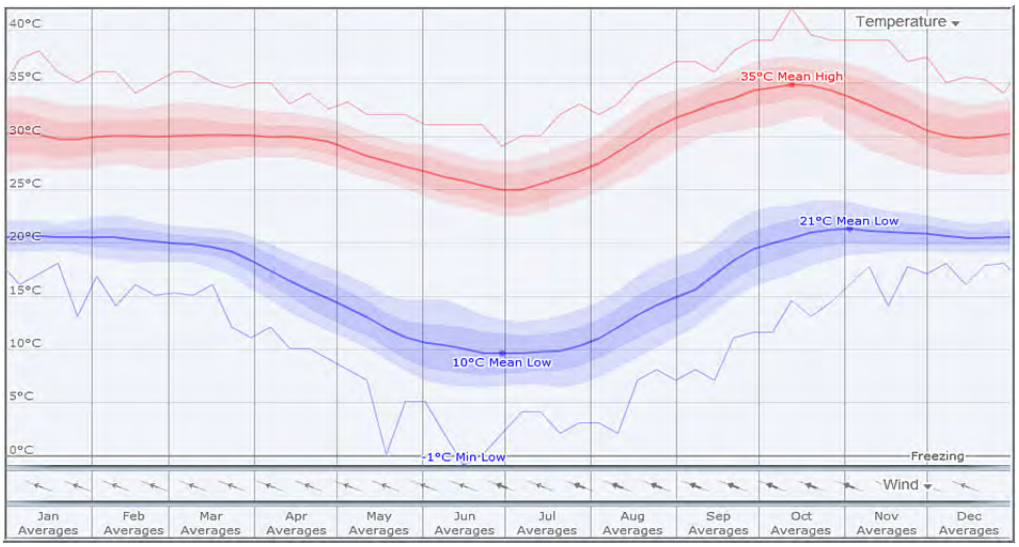


Figure 4.4: Maximum and Minimum Monthly Mean Temperatures in CH/12 for the period January 1996 to December 2011

4.5 RELATIVE HUMIDITY

4.5.1 As illustrated in Figure 4.5, relative humidity in CH/12 typically ranges from 16% (dry) to 94% (very humid) over the course of the year, rarely dropping below 10% (very dry) and reaching as high as 100% (very humid). The air is driest around September, at which time the relative humidity drops below 19% (dry) three days out of four; it is most humid around January, exceeding 92% (very humid) three days out of four. Humidity also increases before rainstorms, and is therefore also high between November and March.

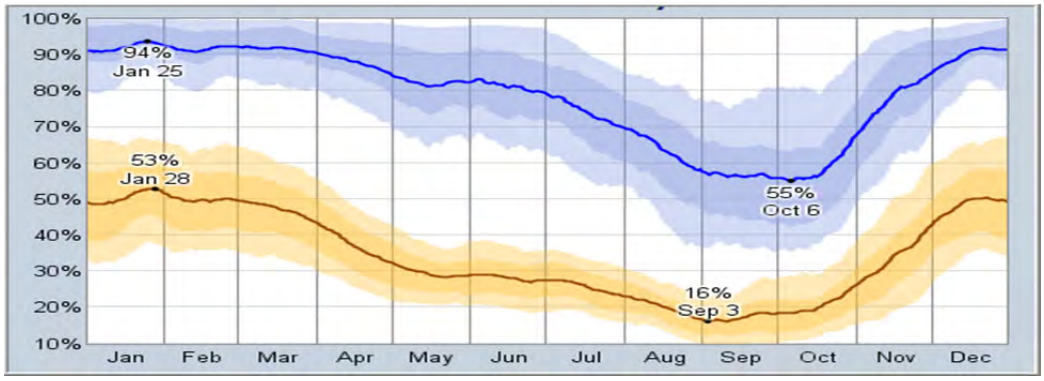


Figure 4.5: Average daily high (blue) and low (brown) relative humidity

4.6 SOLAR RADIATION

4.6.1 The potential solar radiation for CH/12 was calculated using the solar radiation analysis tool in the ArcGIS Spatial Analyst extension (Figure 4.6). The tool enabled mapping the effects of solar radiation/insolation over the project area for the year 2012. It accounts for atmospheric effects, site latitude and elevation, steepness (slope) and compass direction (aspect), daily and seasonal shifts of the sun angle, and effects of shadows cast by surrounding topography (FAO, 1998).

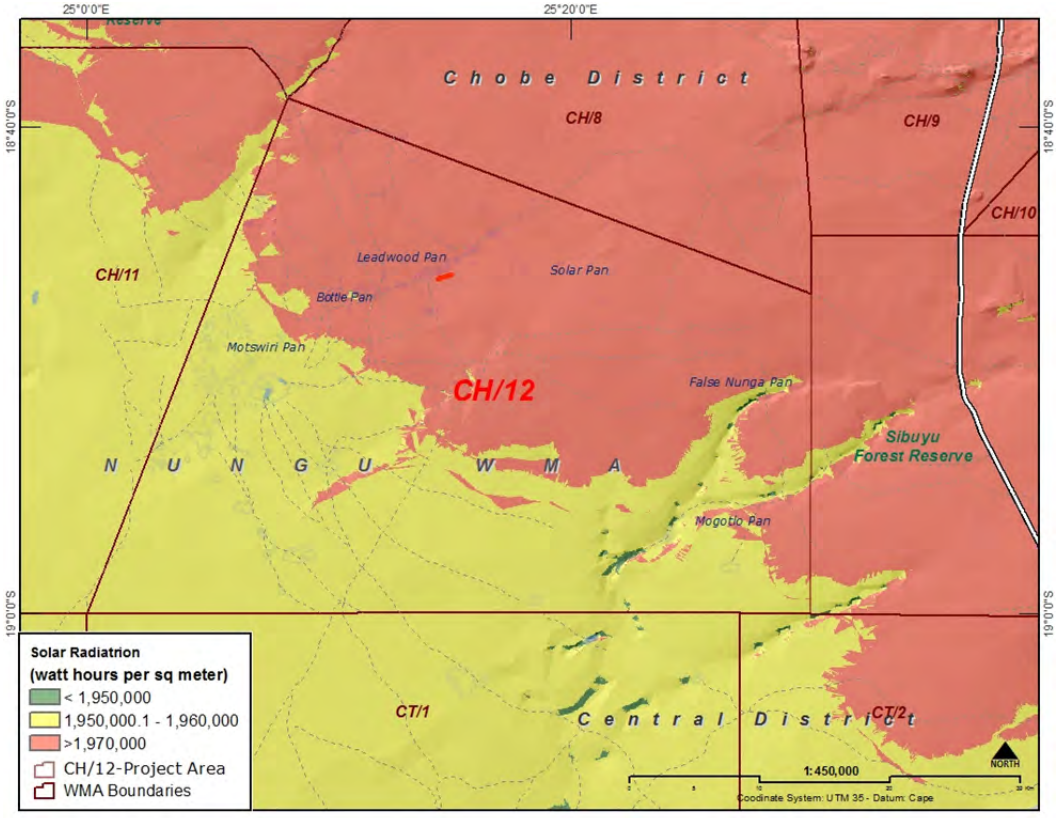


Figure 4.6: Annual Solar Radiation Potential over CH/12

4.6.2 As illustrated in Figure 4.6 the model results have shown that the total annual solar radiation over CH/12 spans between 1,950,000 to 1,970,000 watt hours per square meter (WH/m^2) with a total average sunshine duration of more than 4300 hour per annum. This suggests a very high level of solar radiation (insolation) throughout the year.

4.7 SURFACE WIND

4.7.1 As highlighted in the Figures 4.7 and Figure 4.8 the prevailing winds in CH/12 come from the east and northeast (34% and 26% over the entire year respectively).Over the course of the year typical wind speeds vary from 0 m/s to 9 m/s (calm to moderate breeze), rarely exceeding 10 m/s (strong breeze). The incidence of higher wind speeds (moderate breeze) usually occurs around October when dust storms and soil erosion can occur particularly if there has been no rainfall.

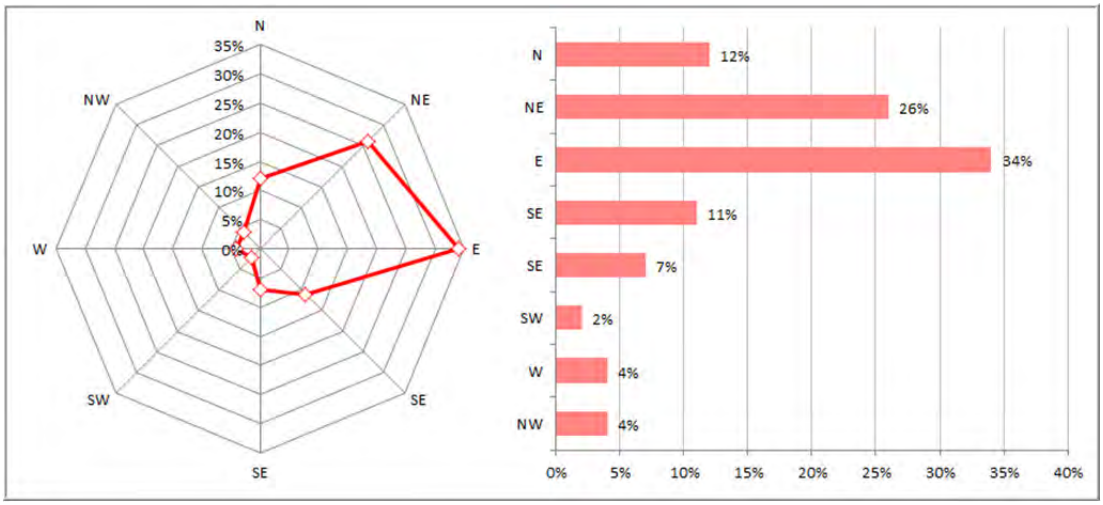


Figure 4.7: Wind- direction for January 1996 - December 2011

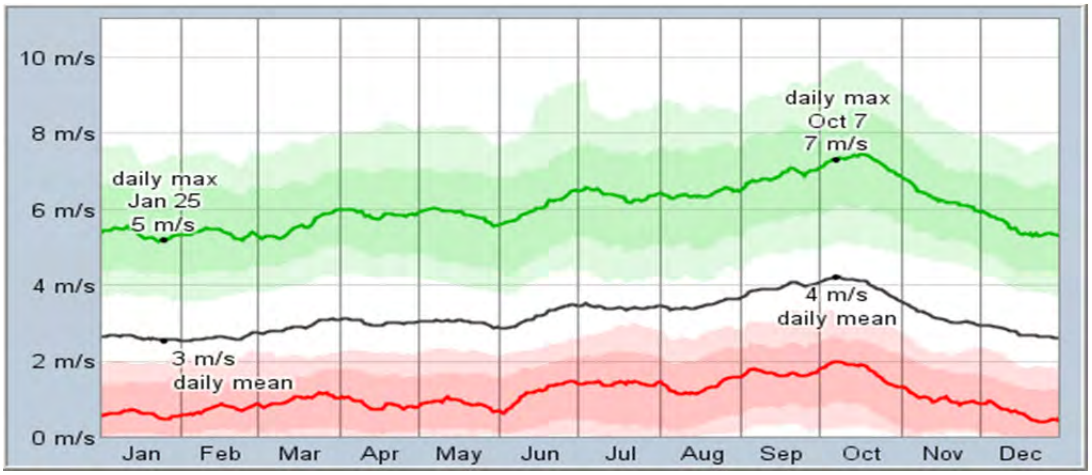


Figure 4.8: Average daily minimum (red), maximum (green), and average (black) wind speed in CH/12 and surrounding region (Source: WeatherSpark.com)

4.8 GLOBAL WARMING

4.8.1 The whole of Africa is considered highly vulnerable to climate change. Specifically, the Third Assessment Report of the Intergovernmental Panel on Climate Change (IPCC) notes a warming of about 2^{0}C over most of the African continent during the twentieth century based on historical records (UNEP, 2002). It was found with respect to the wider region where CH/12 is located that the diurnal temperature range is decreasing. There are hotter days and fewer cold days over time.

Night-time minimum temperatures increased at twice the rate of daytime maximum temperatures. Precipitation deviations from a long-term mean are stated to have increased during the last century. While the exact nature of the changes in temperature or precipitation and extreme events are not known, there is general agreement that extreme events may worsen, and trends in most environmental and ecological variables in CH/12 will likely change in response to warming. This would require active and adaptive management responses to deal with such anticipated regimes of change. The development of the Tourism Management Plan for CH/12 must be rooted in the management of such anticipated changes, as and when they do occur.

4.8.2 With regard to climate changes assumptions over the region surrounding CH/12, it is namely anticipated that rainfall may decrease by more than 15%. Furthermore, both summer and winter minimum temperatures in the concession area are expected to rise by 2-3°C, with maximum temperatures expected to increase by 1-2°C. Potential evaporation is expected to increase by 6-8%. This will have a significant impact on runoff and amplify the impacts of the already high year-to-year and longer-term variations in rainfall. This will furthermore have significant implications on hydrology and ecosystem services associated with natural pan system in the concession area.

4.8.3 It is also considered important to emphasize the fact that it is unlikely that any of the aforementioned climate change assumptions will affect the CH/12, especially within the 15-years management plan's timeframe. In this regard, there is a high level of confidence that the ecosystem throughout the concession area will continue to operate within known cyclical and seasonal fluctuations.

4.9 TOPOGRAPHY

4.9.1 As illustrated in Figure 4.9, CH/12 is generally flat with relief differences over the entire area in the order of 65 m. Specifically, the concession area lies at an altitude of between 1060 - 995 meters above sea level with a topographic surface that, dips very gently from the elevated north east to the lower lying south west area, as well as the area along the Nunga River.

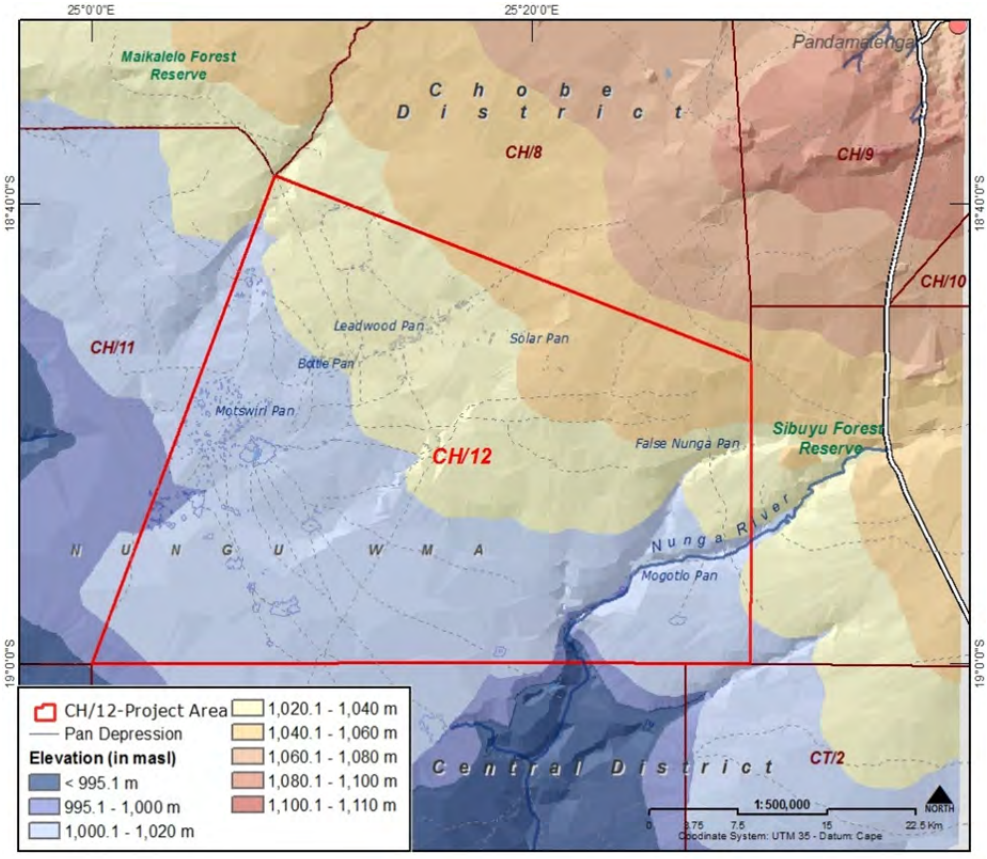


Figure 4.9: Height Zones in CH/12 (Source GISPlan)

4.9.2 In terms of site slope, CH/12 is characterised by a flat terrain with no rock outcrops (Figure 4.10). Specifically, more than 98 percent of the concession area is associated with plains or flat terrain with slopes of less than 1%. However, the prominence of very flat areas with a slope less than 0.2% presents some surface drainage limitation.

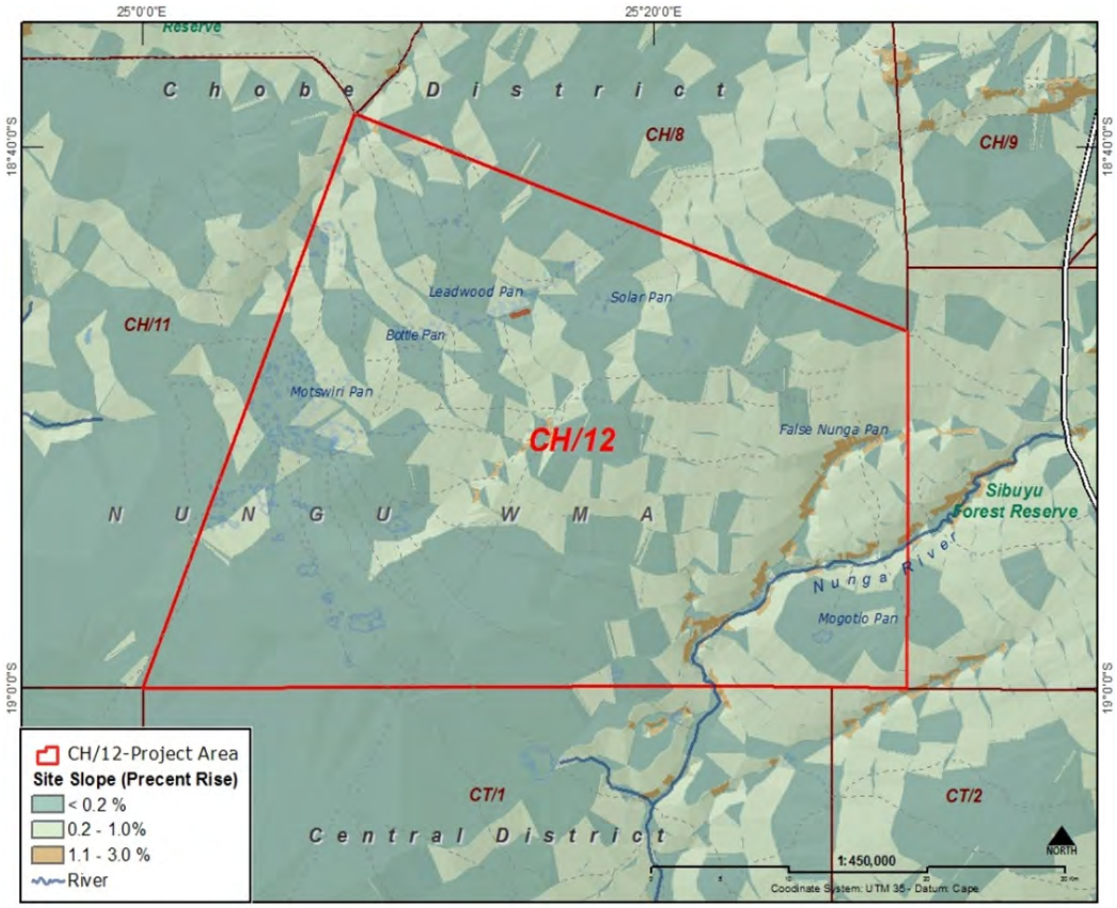


Figure 4.10: Site Slope in CH/12 (Source GISPlan)

4.10 GEOLOGY

4.10.1 The hard rock geology of CH/12 is characterised by limited outcrops as most of the area is covered by a layer of relatively thick to very thick Kalahari Sediments. There are a series of unconsolidated aeolian and alluvial sediments resting unconformable on older and eroded Karoo group rocks. These rocks essentially comprise a succession of sedimentary and volcanic rocks formed during Carboniferous to Jurassic times. The origin, composition and thickness of Kalahari Sediments are significant to the presence, yield and quality of groundwater in the project area.

4.10.2 From the structural geology point of view, CH/12 is an area which has been affected by north east - south west (normal) faulting and flexure. As illustrated in Figure 4.11, faulting and flexure along this direction has in the recent geologic past had a profound effect on the geomorphological evolution of the study area. This is particularly true of drainage patterns. There is some evidence to suggest that some of faults surrounding CH/12 are currently active.

4.10.3 At the current level of the area's geological investigation and related knowledge, there seems to be neither major economic mineral deposits nor any on-going prospecting activities in CH/12.

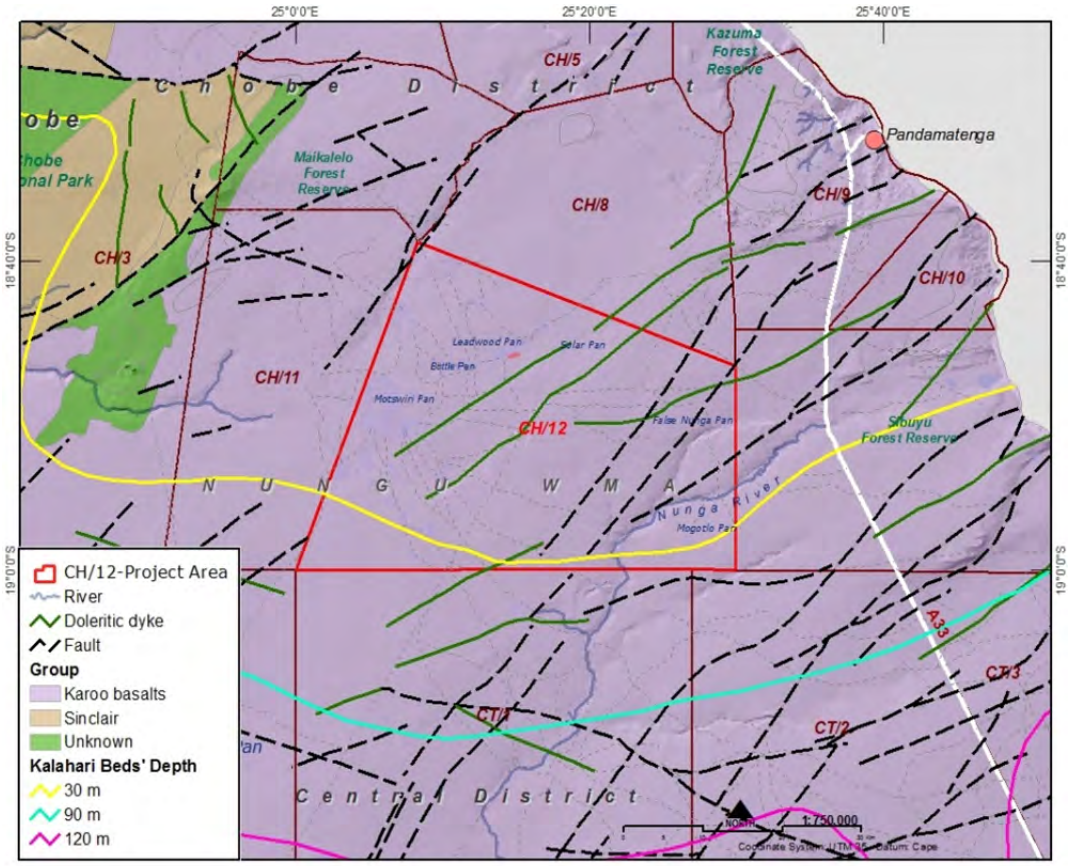


Figure 4.11: Regional Bedrock Geology (Source DGS)

4.11 HYDROGEOLOGY

Groundwater Potential and Pollution Vulnerability

4.11.1 As presented in Figure 4.12, most of CH/12 is classified as having a fair or generally high but variable groundwater potential. Accordingly, there seems to be no major constraints on groundwater availability in the concession area. The main groundwater resources are likely to be found in the Kalahari Group sediments. These aquifers are generally unconsolidated aeolian and fluvial sands. Recharge occurs predominantly by direct percolation from the surface and from the existing ephemeral water sources (NWMP, 1991). Potentially larger water resources may also exist below Kalahari Group sediments in the basalt and potentially in the Karoo sandstones.

4.11.2 Regarding vulnerability to pollution, groundwater resources differ from surface water in that they are not distinct, visible channels, move very slowly and are less prone to rapid temporal variation than surface water. Without proper monitoring and management human and wildlife impacts on groundwater resources and vice versa are usually difficult to detect. With regard to this it is noteworthy that an analysis of water samples from the existing boreholes instituted by the present concessionaire revealed that none of the boreholes currently in use are showing signs of adverse microbial and nitrate pollution.

4.11.3 Figure 4.12 also shows areas of the concession's groundwater sensitivity from the perspective of potential vulnerability to contamination as a result of land development or land use activities. Areas are classified in risk categories (negligible, low, moderate, and high) based on the assumed vertical permeability of the soils and geological settings.

4.11.4 The only area with moderate vulnerability to pollution is around Motswiri Pan where groundwater lies close to the surface and where according to National Water Master Plan (NWMP) the probability of a borehole yield of 18.2m³/day is above 80 percent.

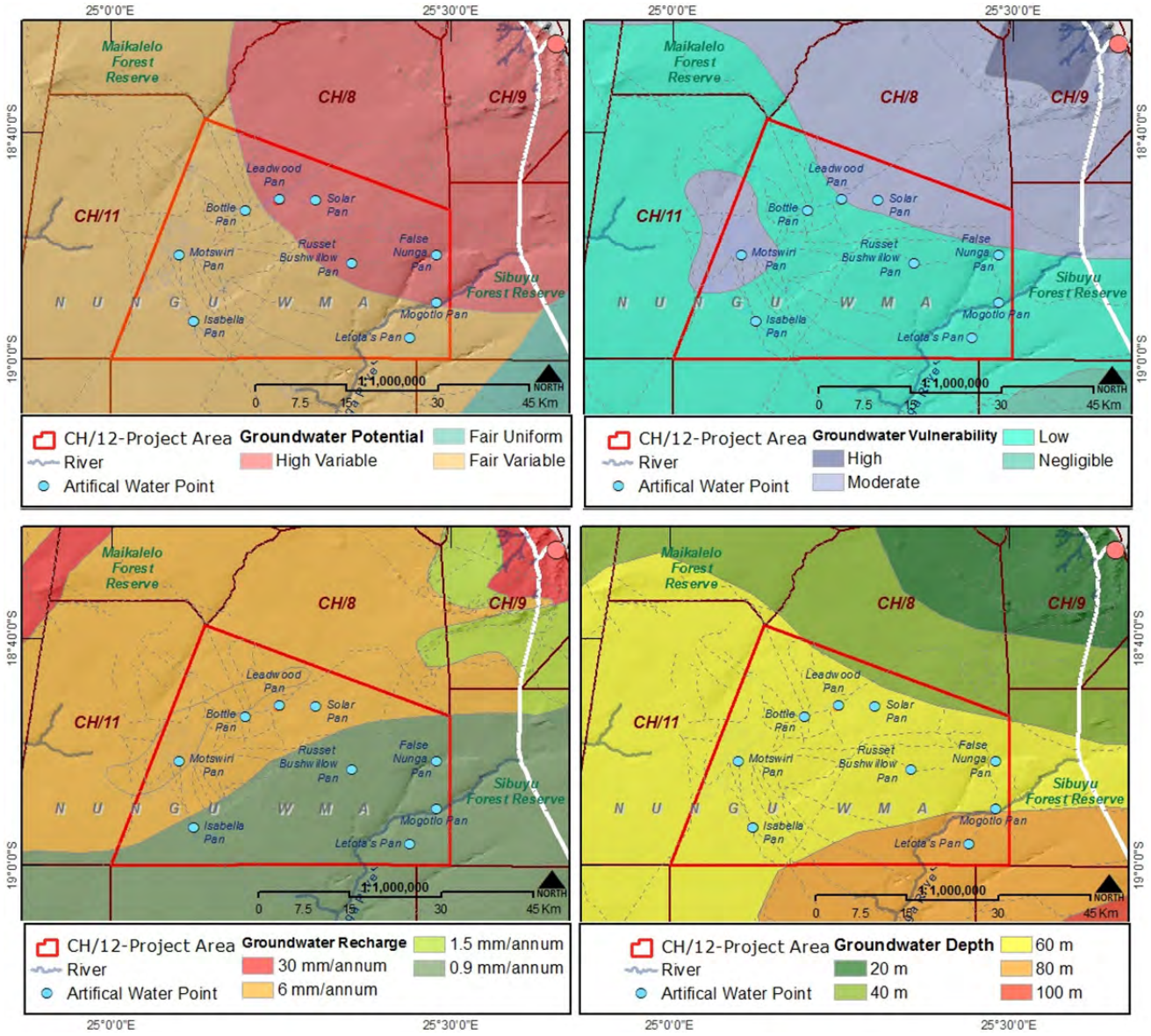
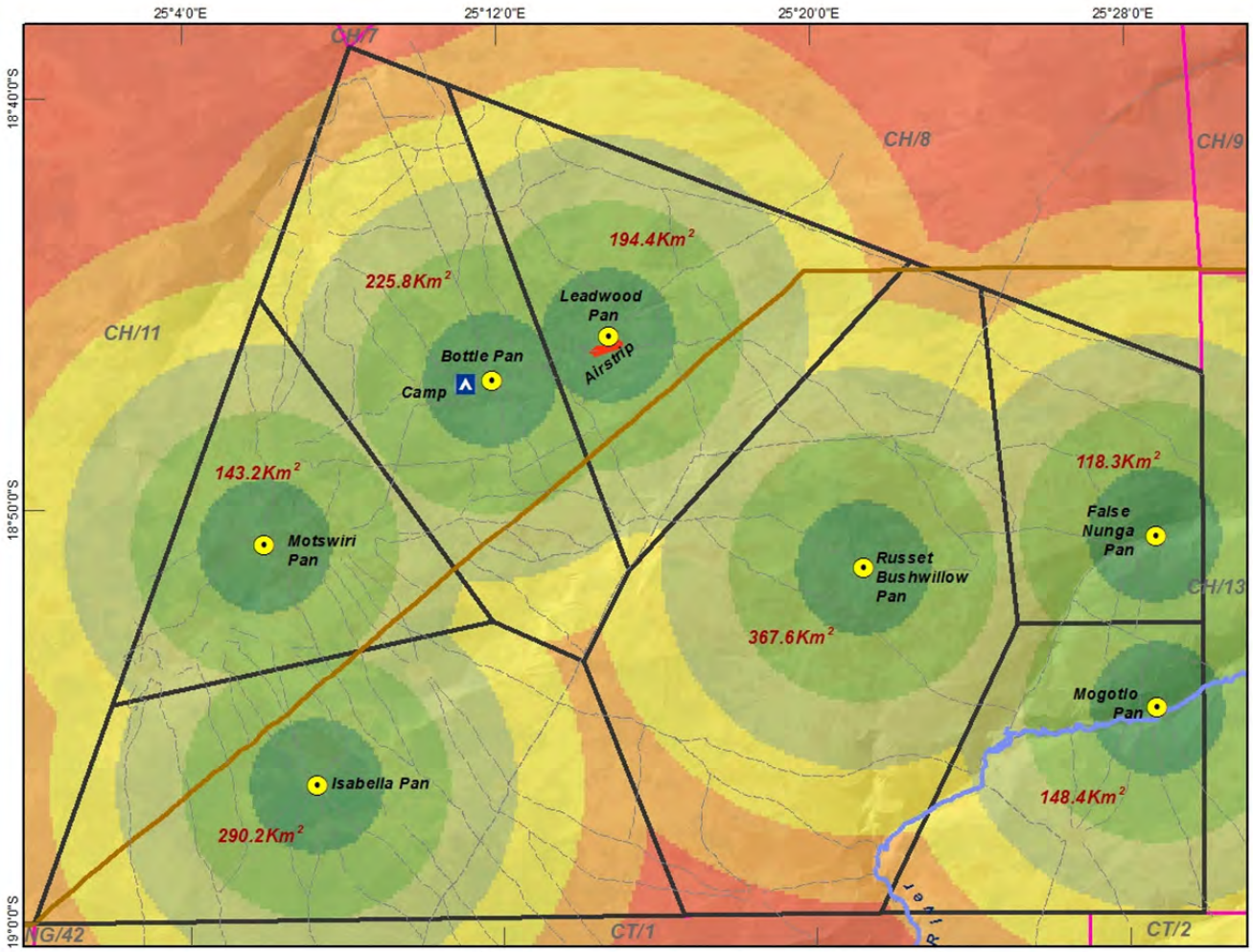


Figure 4.12: Summary of Groundwater resources in CH/12 (Source DWA)

4.11.5 The regional-scale vulnerability information as presented in Figure 4.12 is used to gauge the relative vulnerability of an area. This evaluation however should not be considered as a definitive and actual risk of groundwater contamination for the concession area. An area may be judged to be more sensitive to contamination than another area under the same development conditions. Actual risk can only be determined by a site-specific investigation. Accordingly, the vulnerability evaluation presented here aims at identifying groundwater contamination as an issue that would guide the formation of land use proposals through source-directed controls, alternative site selection and /or mitigation strategies.

4.11.6 With regard to groundwater recharge, estimates for CH/12 and its surrounding region (made as part of the National Water Master Plan – DWA, 2001) indicated that recharge is highest in the north-west part of the concession area, in distinction from its south-east portion where soils are of lower permeability.



False Nunga Pan	
Depth	153 m
Yield	5000-7000 liters/hour
Quality	Good quality potable water
Nearest BH	7654 meters
Status	Active (generator based pump)

Motswiri Pan	
Depth	100m (water level 85 m)
Yield	2000 liters/hour
Quality	Brackish/Saline water
Nearest BH	11045 meters
Status	Active (generator based pump)

Mogotlo Pan	
Depth	100 m
Yield	2500 liters/hour
Quality	Good quality potable water
Nearest BH	7653 meters
Status	BH colapsed (a new is being drilled)

Bottle Pan	
Depth	50m (2 holes)
Yield	500/3000 liters/hour
Quality	Good quality potable water
Nearest BH	5594 meters
Status	Active (generator based pump)

Russet Bush Willow Pan	
Depth	100m
Yield	very poor
Quality	Good quality potable water
Nearest BH	13203 meters
Status	Active (Solar Pump)

Leadwood Pan	
Depth	80 m
Yield	2500 liters/hour
Quality	Good quality potable water
Nearest BH	5594 meters
Status	Active (generator based pump)

Isabella Pan	
Depth	100m
Yield	very poor
Quality	Brackish/Saline water (Sulfur smell)
Nearest BH	11045 meters
Status	Active (generator based pump)

Legend

- Artificial Water Points

Existing Infrastrucure

- Airstrip
- Trail System
- Cut Line
- Fossil River Channel
- Proximity to Water Point
- CHA Boundaries

Distance from Water Point

- < 3,000 m
- 3,000.1 - 6,000 m
- 6,000.1 - 9,000 m
- 9,000.1 - 12,000 m
- 12,000.1 - 15,000 m
- > 15,000 m

1:300,000

NORTH

0 2 4 8 12 Km

Coordinate System: UTM Zone 35- Datum WGS 84

Consultant: GIS Plan

Client: botswana tourism

Tourism Management Plan for CH/12

Map 4.1

CH/12 - Artificial Water Points Distribution and Proximity

Distribution of Water Points

4.11.7 As illustrated in Map 4.1 there are seven (7) boreholes currently operational in CH/12. All of them are being used for permanent, artificial water provision for wildlife by means of pumping water from a borehole into nearby natural pan.

4.11.8 The GIS-based "buffer" analysis (Map 4.1) demonstrated that there is virtually no part of the concession area that is greater than 15 km from a water source. Specifically, 43.3% of the concession is within 6 km from a water source, 73.2% of the concession is within 9 km of a water source, and 91.0 % within 12 km of a water source (Table 4.1).

Table 4.1: Spatial Coverage of Artificial Water Points in the CH/12

Distance from Water Points	Total (in Km^2)	% of Total
< 3.0 km	193.25	13.0
3.1-6.0 km	451.08	30.3
6.1-9.0 km	444.48	29.9
9.1-12.0 km	264.26	17.8
12.1-15.0 km	115.58	7.8
> 15.1 km	19.18	1.3

4.11.9 The nearest neighborhood distance analysis showed that distance between water points in the concession varies from 5.6 km (minimum) to 13.2 km (maximum) with an average nearest neighborhood distance of 8.8 km.

4.12 HYDROLOGY

4.12.1 CH/12 is a part if the wider sandveld land region characterized by the lack of permanent surface water. The area is endowed with Mopane pan system (stretching from northeast to south west) which typically retains water during, and shortly after the rainy season.

4.12.2 The Nunga valley is the major fossil drainage which cuts across the southeastern section of CH/12. Though deemed to be a fossil landform, the valley may sporadically contain contemporary stream flow due to short-term high volume precipitation. As illustrated in Plate 4.1, the Nunga River channel is especially well drained in the eastern section towards Sibuyu Forest Reserve where there is fairly thick riverine vegetation. The river channel becomes less prominent toward the south.

Plate 4.1: Riverine Zone along the Nunga River channel in CH/12

4.13 SOILS

4.13.1 Soil formation in the study area has been influenced by the climatic fluctuations of the Quaternary Period. Parent materials are mainly the unconsolidated sediments of the Kalahari system. Soils are therefore mostly of Aeolian origin.

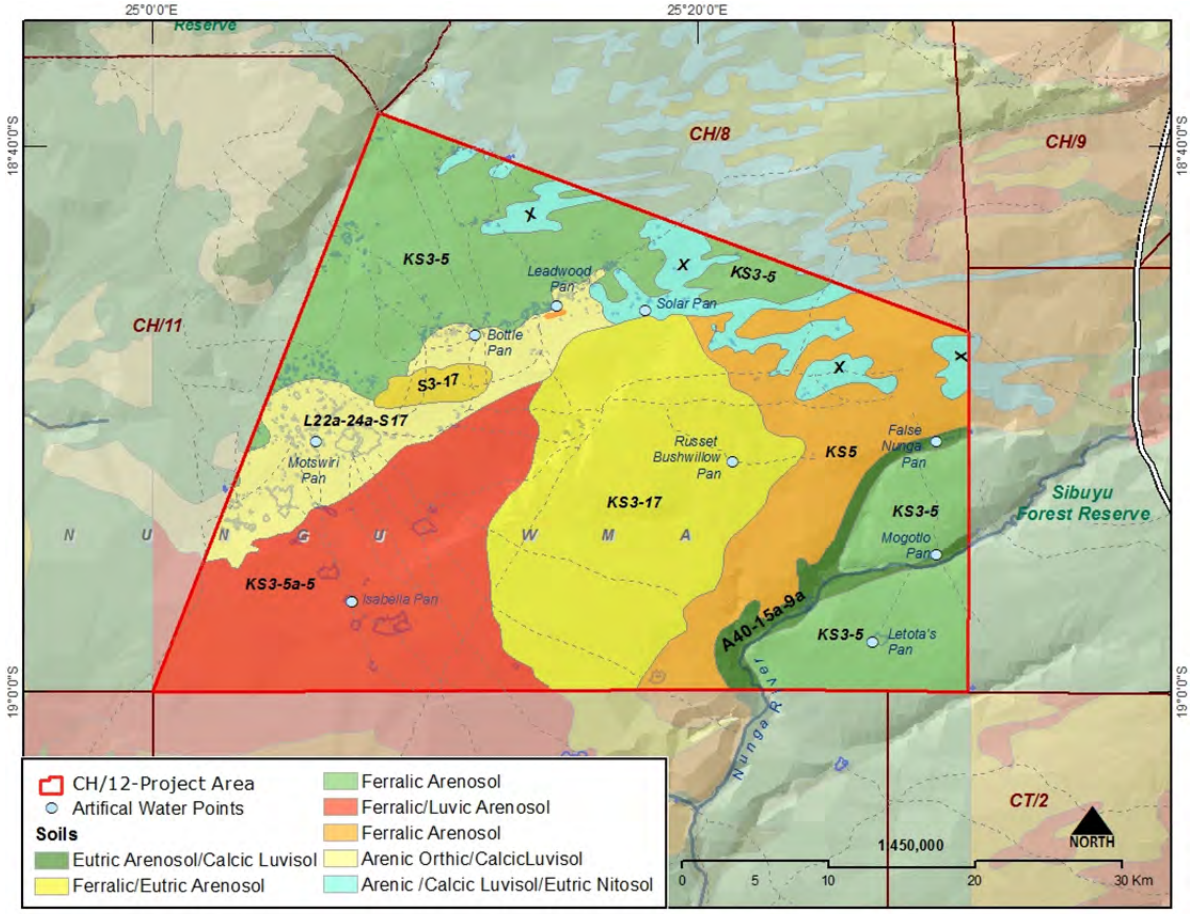


Figure 4.13: Soils Types in CH/12

4.13.2 As can be gleaned from Figure 4.13, CH/12 is dominated by Arenosols which are generally deep free draining sands resulting in high water infiltration rates, low water holding capacity and fairly reduced fertility There may be localised accumulations in places due to reworking that could form patches of luvisols, which are, are important in facilitating the formation of pans. Specifically, climatic fluctuations in the area have given rise to the formation of duripan (hard, impermeable subsurface) layers in some places (calcrete, silcrete or ferricrete) which may impede drainage, or host perched groundwater. Vegetation on these soils is generally adapted to high moisture availability for short periods of time, or to utilizing perched groundwater.

4.13.3 Patches of Luvisols have been spotted to the west of the concession area and along the Nunga River valley. These soils are characteristically deep, imperfectly to moderately well drained loams with varying proportions of sand and clay. In comparison with Arenosols, Luvisols are characterized by the higher accumulation of clay (15-25%) and, therefore higher fertility. There is some correspondence between the distribution of Luvisols and that of small pans. The increase in clay with depth means that the water storing capacity of the predominantly sandy soil is improved. Sequential excavations by wildlife such as warthogs and elephants in search of subterranean plant resources also contribute to pan establishment and subsequent changes in soil physicochemical

properties. Some waterlogging may occur depending on the topographic position of the soil. Vegetation is thus is adapted to minor periods of anaerobic conditions in the lower root zone.

4.14 VEGETATION OF CH/12 IN RELATION TO THE TOURISM PRODUCT

4.14.1 CH/12 is characterized by dry deciduous, broad-leaved, and fine-leaved savanna vegetation. The fine leaved savanna vegetation types are dominated by the Acacia species while the broad-leaved savannas are characterized predominantly by *Burkea Africana* (Mosheshe/Monato), *Baikiaea plurijuga* (Mokusi), *Colophospemum mopane* (Mophane), as well as *Terminalia and Combretum* species (see Table 4.3 for common, local, and scientific names of plants found in CH/12).

Table 4.2 Scientific, Local, and Common Names of Selected Plants Found in CH/12

Scientific (Latin) Name	Local (Tswana) Name	Common (English) Name
Woody Plants		
Acacia erioloba	Mogotlho	Camel thorn
Acacia fleckii	Mohahu	Blade thorn
Acacia luederitzii	Mooka, Mokgwelekgwele	Kalahari sand thorn
Adansonia digitata	Mowana	Baobab
Baikiaea plurijuga	Mokusi	Zambesi Redwood
Boscia albitrunca	Motlopi	Shepherd's tree
Burkea africana	Mosheshe	Wild syringa
Colophospermum mopane	Mophane	Mopane
Combretum collinum	Modubana	Variable combretum
Combretum hereroense	Mokabi	Russet bushwillow
Combretum imberbe	Motswere	Leadwood
Croton subgratissimus	Moologa	Lavender fever berry.
Mundulea sericea	Mohato/Mositatlou	Cork bush
Erythrophleum africanum	Mmako/Mokonkochi/Mobaku	Ordeal tree
Schinziophyton rautanenii	Mongongo	Manketti/ Featherweight tree
Terminalia sericea	Mogonono	Silver cluster-leaf
Grasses		
Aristida congesta	Seloka	Spreading Three-awn
Cenchrus ciliaris	Modikangwetsi/Mosekangwetsi	Foxtail Buffalo Grass
Cynodon dactylon	Motlho/Motlhwa	Couch Grass/Bermuda grass
Eragrostis pallens	Motsikiri	Broom grass
Eragrostis rigidior	Rathethe	(Broad) Curly Leaf
Eragrostis superba	Mogamapudi	Fan Grass
Schmidtia pappophoroides	Tshwang/Bojang jwa pitse	Sand quick
Stipagrostis uniplumis	Tshikitshane	Glitter grass/Shiny bushman grass
Urochloa trichopus	Phoka	Signal grass

4.14.2 The concession area's dry woodland savanna vegetation forms the basis for terrestrial wildlife habitats, particularly water-independent wildlife species. Similar to many dry land savannas around the world, vegetation structure and species diversity (abundance, composition and equitability) of CH/12 is driven by competition (intra-and inter-specific), predation (herbivory) and environmental variation and variability (rainfall, edaphic, and fire regimes). The interaction and impact of all these factors creates environmental heterogeneities for several plant-related variables leading to the development of distinct vegetation communities in CH/12.

4.14.3 As already highlighted, CH/12 rests on the Sandveld System represented by Aeolian sand deposits which are generally of poor nutrient quality, with pockets of nutrient-rich soils in selected locations of the concession area (Figure 4.13). Soils in the *C. Mopane* and *Acacia* areas (Map 4.2) have a higher clay content and nutritional status. Large herbivores prefer these latter areas

because the associated grasses are more palatable and rainfall collects in natural pans as surface water resources in these areas.

Table 4.3 Spatial Coverage of Specific Plant Communities in CH/12

Plant Community	Area in Hectares	% of Total
Acacia erioloba	13295.2	8.9
Baikiaea plurijuga -B.massaiensis- Combretum collinum	1189.9	0.8
Baikiaea plurijuga - Schinziophyton rautanenii - Burkea africana	1364.6	0.9
Combretum hereroense	6993.3	4.7
Colophospermum mopane	23194.5	15.6
E.africanum shrub	796.6	0.5
E.africanum tree	2227.9	1.5
Nunga	1437.4	1.0
Terminalia sericea	7333.2	4.9
Terminalia sericea –Burkea .africana	71271.6	47.9
Terminalia sericea -B.massaiensis-C.collinum-B.africana	1699.4	1.1
Terminalia sericea - Baikaea plurijuga	16036.3	10.8
Terminalia sericea - Baikaea plurijuga - Burkea africana	1457.4	1.0
Terminalia sericea low shrub	515.6	0.3
Total CH/12	148812.7	100.0

Source: 9th Ecological Evaluation of CHA CH/12, 2012; DIES, 2012

4.14.4 Vegetation communities of CH/12 are structured along soil-fertility and soil-depth heterogeneities, giving rise to a mosaic of vegetation types which form a spectacular view. Prominent vegetation communities within the concession include (Dubel Integrated Environmental Services (DIES), 2012):

(i) *Colophospermum mopane* (Mophane) community,

(iv) Terminalia sericea (Mogonono) -Baikiaea plurijuga (Mokusi) community,

(v) *Acacia erioloba* (Mogotlho) -*Acacia leuederitzii* (Mooka) community, and

(vi) Combretum imberbe (Motswere) -Combretum hereroense (Mokabi) community

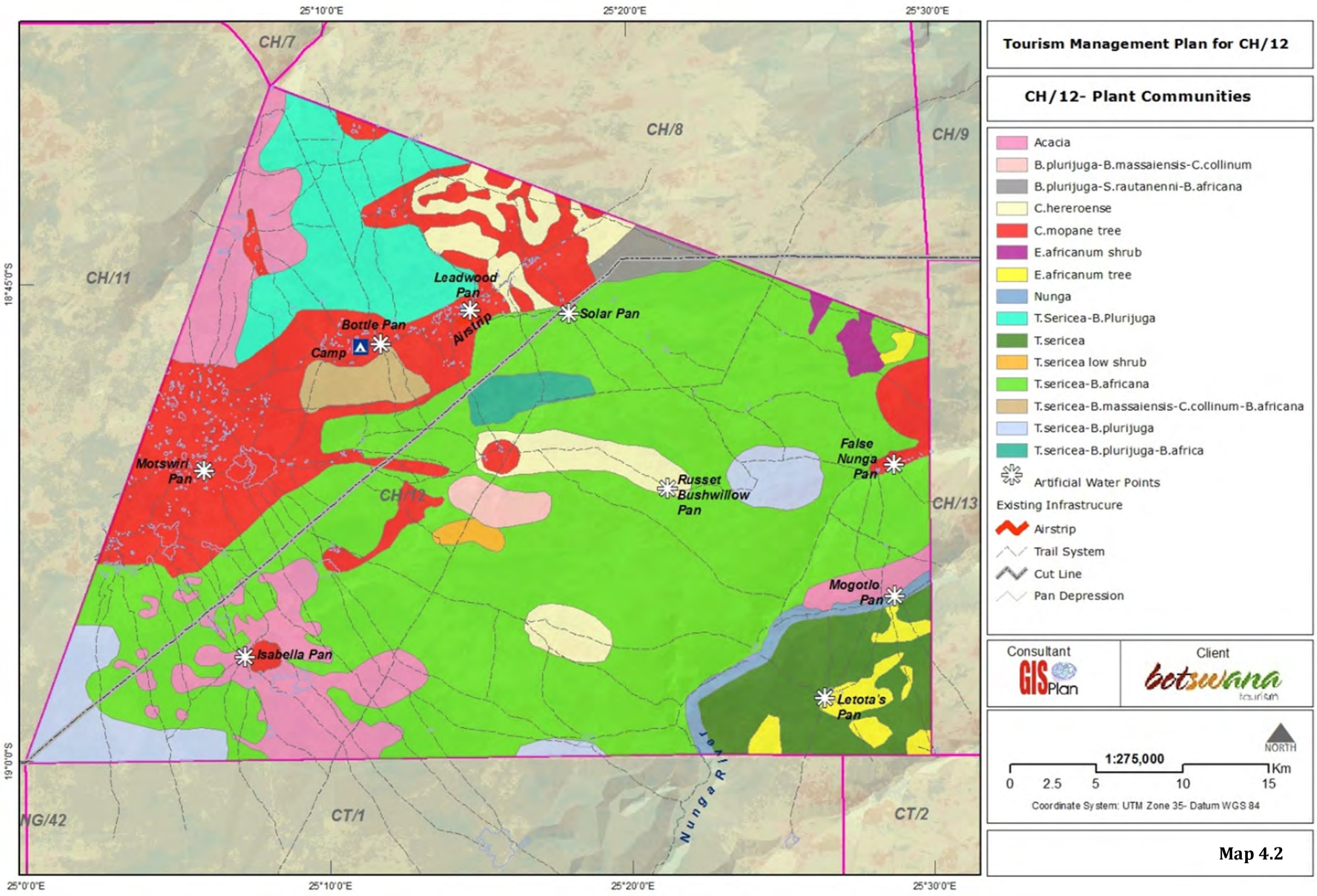
4.14.5 The spatial coverage of specific plant communities in CH/12 are indicated in Table 4.4.

4.14.6 While Map 4.2 illustrates distribution of the prominent vegetation communities in CH/12, Table 4.4 summarises their soils and associated characteristics.

Table 4.4: Soils, Drainage Pattern and Grass Palatability in CH/12's Prominent Plant Communities

Plant Community	Soils	Depth	Drainage	Palatability
Acacia erioloba (Mogotlho) *Acacia leuederitzii* (Mooka) *Combretum. imberbe Motswere) Combretum . hereroense* (Mokabi)	Light brown clayish and compacted	Moderately to deep	Imperfectly drained	Palatable
Terminalia sericea (Mogonono) - *Burkea plurijuga* (Mokusi)	Sandy with low clay content	Deep	Well-drained	Low in nutrient with low palatability
Colophospermum mopane (Mophane)	Sandy to Loamy	Moderately to deep	Well to imperfectly drained	Palatable

Source: 9th Ecological Evaluation of CH/12 CHA, Envirodel 2012; Dubel Integrated Environmental Services (DIES) 2012


25°10'0"E
25°20'0"E
25°30'0"E
18°45'0"S
19°0'0"S
25°0'0"E
CH/7
CH/8
CH/9
CH/11
CH/12
CH/13
NG/42
CT/1
CT/2
Leadwood Pan
Airstrip
Solar Pan
Bottle Pan
Camp
Motswiri Pan
Russet Bushwillow Pan
False Nunga Pan
Mogotlo Pan
Isabella Pan
Letota's Pan
Nunga River
Tourism Management Plan for CH/12
CH/12- Plant Communities
Acacia
B.plurijuga-B.massaiensis-C.collinum
B.plurijuga-S.rautanenni-B.africana
C.hereroense
C.mopane tree
E.africanum shrub
E.africanum tree
Nunga
T.Sericea-B.Plurijuga
T.sericea
T.sericea low shrub
T.sericea-B.africana
T.sericea-B.massaiensis-C.collinum-B.africana
T.sericea-B.plurijuga
T.sericea-B.plurijuga-B.africa
Artificial Water Points
Existing Infrastrucure
Airstrip
Trail System
Cut Line
Pan Depression
Consultant
GIS Plan
Client
botswana tourism
NORTH
1:275,000
0 2.5 5 10 15 Km
Coordinate System: UTM Zone 35- Datum WGS 84
Map 4.2

4.15 *Terminalia sericea* (MOGONONO) - *Burkea africana* (MOSHESHE/MONATO) PLANT COMMUNITY

4.15.1 *Terminalia sericea* (Mogonono*)* – *Burkea africana* (Mosheshe/Monato) forms the major plant community and dominates the north-eastern, eastern, central, southern and south-western parts of CH/12 (Map 4.2). It covers more than 60% of the concession. This plant community is associated with sandy soils (predominantly Arenosols) of poor nutrient status and less palatable trees, shrubs and grasses.

4.15.2 With regard to species composition, this vegetation community is predominantly characterized by a mosaic of high and low tree layers dominated by *Terminalia sericea* (Mogonono) with pockets of *Combretrum collinum* (*Modubana),* as well as large *Baikiaea plurijuga* (Mokusi). It was furthermore observed that within this community, many sub-communities occur. These include the *Burkea africana* (Mosheshe/Monato) woodland which is normally scattered within the community, as well as the large *Schinziophyton rautanenii* (Mongongo) tree sub-community, found in the central northern area and forms large trees 20 m high.

Plate 4.2: Terminalia sericea – Burkea africana found in CH/12

4.15.3 Grass species found in the herb layer of this community include *Digitaria eriantha, Eragrostis pallens, (Motsikiri), Schmidtia kalahariensis, Anthepora pubescens, Aristida stipitata, Eragrostis rigidior, Schmidtia pappophoroides, Stipagrostis uniplimus, Heteropogon contortus, Bothrichloa insculpta and Brachiaria nigropedata*. Except for the low abundance *Brachiaria nigropedata*, all the foregoing grass species are associated with the sandy soils and are of low forage value.

4.15.4 Ecological evaluation exercises instituted annually by the current concessionaire revealed that the general veld condition of this community improved from 2004 to 2006, deteriorated in 2007, and improved thereafter most likely because of consecutive high rainfall years from 2008 to 2011. The lower rainfall of early 2012 resulted in deterioration of veld condition.

4.15.5 4.15.5 Generally, field surveys coupled with findings of existing vegetation evaluation studies (notably the DIES Report, 2012) revealed that the veld conditions in this community are far better that in Acacia and C. mopane (Mophane) plant communities. This suggests that the lack of surface water (or scarcity of artificial water points), together with lower palatability prevents this plant community from being overgrazed. It was, however, observed, that areas of this plant community adjacent to *C. mopane* (Mophane) and *Acacia erioloba* (Mogotlho) pan systems are more utilized than the vegetation further away from water points, especially during the low rainfall or drought years. Specifically, it was observed that the increase in utilization of grasses by wildlife usually takes place when grazing is in short supply around water points and along drainage lines. It was

also noted that elephants use many footpaths which usually tracks the drainage system through T. *sericea* (Mogonono) plant community and utilization of these path are sometimes quite intensive. With regard to this, incidences of bush encroachment were observed especially near the *Acacia erioloba* (Mogotlho) plant community (Map 4.2).

4.15.6 It was furthermore observed that the low grazing pressure on these grass species accounted for by their low quality leads to high fuel load, making this community fire-prone. An important factor that influences the condition of *T. sericea* community is the recovery after a fire. The woody structure of areas that burned is quite open, but subsequently these areas become very dense with numerous shrubs that coppice. This has a shading effect on grasses and as such the woody component out-competes the herbaceous layer for moisture, nutrients and light. Follow-up rainfall events can significantly influence vegetation recovery after fires.

Ecological Importance Of *Terminalia sericea* (Mogonono) – *Burkea africana* (Mosheshe) Plant Community

4.15.7 Ecological characteristics and importance of *Terminalia sericea (Mogonono) – Burkea africana (*Mosheshe/Monato*)* community are summarized below:

(i) Woody and herbaceous vegetation of *Terminalia sericea (Mogonono) – Burkea africana (*Mosheshe/Monato*)* community in CH/12 provides habitat for a variety of fauna including insects, reptiles, birds, and mammals.

(ii) The *Terminalia sericea* (Mogonono) plant community with associated *Baikiaea plurijuga* (Mosheshe/Monato) and related mixed plant communities are less palatable and less susceptible to continuous herbivory by wildlife due to its lower nutrient status.

(iii) This vegetation community, however, provides forbs and annual grasses of good forage quality during the rainy season. During the dry season, bulk grazers, comprising zebra, buffalo, and elephants, are likely to benefit from the tall grasses found in this vegetation community although grazing tends to be qualitatively limiting.

(iv) This vegetation community also tends to be favored by selective grazers in early summer when moisture, energy and crude protein content is still relatively high.

(v) *Terminalia sericea* (Mogonono) – *Burkea africana* (Mosheshe/Monato) vegetation community is also characterized by diversity of edible and medicinal plants, as well as veld resources which include thatching grass, firewood, and wood-derived construction material. The most common species currently harvested is *Eragrostis pallens* (Motsikiri).

(vi) The vegetation community is highly prone to veld fires due to accumulation of high fuel loads following successive years of above average rainfall and low grazing pressure. It is also capable of relatively rapid recovery following drought, fire and grazing pressure, provided such events are followed by good rainfall.

(vii) Monitoring of vegetation points throughout CH/12 revealed that the average grass palatability index in this vegetation community has slightly decreased from 65% in 2010 to 53% in 2012. The effect of rainfall on the degradation gradient was the main driving force.

Tourism Value of *Terminalea sericea – Burkea africana* Plant Community

4.15.8 Tourism value of Terminalia sericea (Mogonono) – Burkea africana (Mosheshe/Monato) community are summarized below:

(i) Vegetation of the *Terminalea sericea* (Mogonono) - *Burkea africana* (Mosheshe/Monato) community contributes to the tourism product of CH/12 by providing a wilderness experience that can be enjoyed by tourists.

(ii) The vegetation structure is variable, displaying patches of short shrubby vegetation among tall distinct patches of *Baikiaea plurijuga* (Mokusi);

(iii) The distinctively large *Schinziophyton rautanenii* (Mongongo) trees scattered within the community adds value to the wilderness experience offered by this community.

(iv) During the rainy season, tourists could be accorded an opportunity to enjoy beautiful scenery decorated by a variety of colourful flowers.

(v) This vegetation community (when in good condition) provides valuable year-round habitat for Roan antelope, which are part of selective feeders targeting palatable portions of certain perennial grasses. It also provides browse for kudu in summer, and for eland and elephant throughout the year.

4.16 *Acacia erioloba* (MOGOTLHO) - *Acacia luederitzii* (MOOKA) PLANT COMMUNITY

4.16.1 This community is characterised by occurrence of large *Acacia luederitzii* (Mooka) and *Acacia erioloba* (Mogotlho) trees and other species such as *Croton subgratissimus* (Moologa) and *Mundulea sericea* (Mohato). It covers less than 10% of the Concession and occurs mainly in the south-western, northwestern and around the eastern Nunga River area (Map 4.2). This vegetation community is associated with the fertile soils supporting herbaceous species of good forage quality.

Plate 4.3: Acacia erioloba (Mogotlho) - Acacia Luederitzii (Mooka)

plant community found in CH/12

4.16.2 During the field survey it was observed that in the southern part of the concession this vegetation community is less defined with a medium to high tree structure. In the northern part it is more associated with scattered pans and depressions, usually occurring in the *Colophospermum mopane* (Mophane) plant community. Also found under this vegetation community are the common acacias, namely acacias of the pan systems, as well as acacias of the Nunga River system (Map 4.2). With regard to this, it was noted that the southern Nunga River system represents a wide open grassland area with few scattered trees. The eastern Nunga area consists of denser vegetation that resembles riverine conditions.

4.16.3 It was furthermore observed that within the *Acacia* vegetation community, many sub-communities occur. These include the *Boscia albitrunca(Motlopi)* -dominated areas scattered throughout the Acacia community. Grass species found in the herb layer of this community include *Digitaria eriantha, Brachiaria nigropedata, Eragrostis rigidor, Cynodon dactylon, Sporobolus ioclados* and *Eragrostis viscosa*..

4.16.4 It was also noted that the *Acacia* plant community is more susceptible to continuous grazing by wildlife due to the calcareous characteristics of soils which offers more palatable trees, shrub and

grasses to wildlife species. With regard to this, monitoring of the veld conditions revealed that this plant community, especially areas around natural pans, artificial water points and along the Nunga River are subject to continuous wildlife grazing pressure, showing incidences of bush encroachment and densification.

4.16.5 An appraisal of the existing situation and historical trends revealed that the *Acacia* plant communities are highly responsive to climate (rainfall) variability on relatively short time scales. Veld conditions in these vegetation communities have deteriorated during the years 2006 and 2007(DIES Report, 2012). Very low rainfall amounts over the whole 2006/2007 period suppressed vegetation growth both directly and through a reduction in the growth rate of rangeland resources. The situation has improved during successive years (2008, 2009 and 2010) illustrating the resilience of the *Acacia* plant communities and their ability to recover on a relatively short time scale. However, the high responsiveness to climate variability coupled with comparatively low rainfall levels and reduced atmospheric humidity make these vegetation types very sensitive.

4.16.6 Field surveys and existing environmental studies revealed that vegetation of the *Acacia* plant communities are in a poorer state that other plant communities in the concession area due to continuous wildlife grazing pressure. Specific management actions such as veld fires control regimes, management of artificial water points, as well as management of resident and migratory wildlife species will be required to stabilize and/or improve veld condition of the Acacia communities in the concession area.

Ecological Characteristics and Importance of *Acacia erioloba* (Mogotlho) - *Acacia luederitzii* (Mooka) Plant Community

4.16.7 Ecological characteristics and importance of *Acacia erioloba* (Mogotlho) - *Acacia luederitzii* (Mooka) community are summarized below:

(i) Woody and herbaceous vegetation of *Acacia erioloba (Mogotlho) - Acacia luederitzii* (Moaka) community in CH/12 provides habitat heterogeneity in the concession area, subsequently attracting a diversity of animal species such as reptiles, birds and mammals;

(ii) This vegetation community is associated with fertile soils of good clay content supporting palatable grass species, notably *Digitaria eriantha, Brachiaria nigropedata, Eragrostis rigidor, Cynodon dactylon, Sporobolus ioclados and Eragrostis viscosa*.

(iii) Due to the palatability of the vegetation and availability of surface water, the *Acacia erioloba* plant communities are more susceptible to continuous grazing by wildlife.

(iv) *Acacia* species are well known for their role in nitrogen fixation and subsequent nutrient cycling. This community is of significant ecological value since it provides mammalian herbivores with good browsing and grazing in CH/12. However, grazing tends to be quantitatively limiting.

(v) *Acacia spp*. are particularly prized by several herbivores and frugivores for their nutrient-rich seedlings, leaves, shoots, inflorescence, pods, and bark. A wide variety of herbivores, from impala, eland to kudu and elephant, consume the *Acacia* pods. The nutritive value of pods compares well with lucerne.

(vi) Due to the high grazing pressure, this community does not accumulate high fuel loads, leading to low fire occurrence except in years of exceptionally high rainfall.

(vii) This vegetation community is susceptible to trampling and deterioration in basal cover and increase in unpalatable pioneer and sub-climax “increaser” grass species under continuous grazing pressure

(viii) The species composition and veld condition (ecological index value) of this vegetation community is more affected by grazers than the sandveld types (*Terminalia sericea – Burkea africana)*. In addition to this, the general absence of succulent tubers tends to trigger utilisation of the sandveld plant communities in the later dry season, as grass moisture content declines.

(ix) Most ecological benefits brought about by acacias are not immediately apparent. It is many upon reaching maturity and large size, years after establishment, when they begin to have appreciable effects on soil quality, produce large enough patches of shade, and produce pods, gum, construction material and fuel wood;

(x) *Acacia erioloba (Mogotlho) and Boscia albitrunca* (*Motopi)* represent important sources of shade in the dry season. Shade under *Boscia albitrunca* can reduce sand temperatures by 21^{0} C and it is not unreasonable to expect almost as great temperature differentials between the sub canopy and matrix environment for *A. erioloba*. The trees' canopies reduce solar radiation and therefore moderate temperatures and evaporation rates beneath their canopies. Thus, in the heat of the day, mammals tend to concentrate their activities under large trees, with resultant accumulation of faecal deposits and carcasses that eventually decompose and transform into nutrient hotspots beneath their tree canopies;

(xi) Monitoring of vegetation points throughout CH/12 revealed that the average grass palatability index in this vegetation community ranges from 59.7% within *Acacia* community associated with *Boscia albitrunca* (Motlopi) to 74.7% within *Acacia* pan system.

Tourism Value of *Acacia erioloba* (Mogotlho) - *Acacia luederitzii* (Mooka) Community

4.16.8 Tourism value of Acacia erioloba (Mogotlho) - Acacia luederitzii (Mooka) community are summarized below

(i) In CH/12, *Acacia erioloba (Mogotlho) -Acacia luederitzii* (Mooka) community provides the best game viewing opportunity owing to its good grazing and browsing resources.

(ii) Browsers such as kudu and giraffe are a common sighting in this community during the rainy season. Zebra, buffalo, wildebeest, sable antelope and roan antelope prefer this community.

(iii) Wildlife is attracted to this vegetation community during the rainy season due to the presence of natural pans in the summer, making it a relatively prime game viewing plant community.

(iv) The species diversity of herbivores, as well as their utilisation of this plant community tends to increase with progression into dry season. Herbivore presence in the community is also facilitated by the availability of natural mineral licks and waterholes, which are common in this vegetation type;

(v) Similar to other woodland vegetation communities found in CH/12, vegetation of *Acacia erioloba (Mogotlho) -Acacia luederitzii (Mooka)* community contribute to the tourism product of CH/12 by providing a good wilderness and solitude experience that can be enjoyed by tourists.

(vi) *Acacia erioloba* (Mogotlho) is an icon of the Kalahari and Northern Botswana, with great aesthetic appeal. The open savannas with well-spaced trees likely present better game viewing and photographic opportunities than closed woody thickets, or monotonous grassy plains.

4.17 *Colophospermum mopane* (MOPHANE) PLANT COMMUNITY

4.17.1 This plant community covers about 16% of the concession area, and it is associated with soils of medium fertility, with calcrete bases supporting palatable grasses and shrubs. As can be gleaned from Map 4.2, trees or shrubs of this plant community occur mainly in the pan system that stretches from north-east to south-west in the northern part of CH/12 and in the False Nunga Area. It is represented by the occurrence of various tree forms. Shrub variations do occur but are not common and fairly small in extent.

4.17.2 It was observed that the *Colophospermum mopane* (Mophane) community are more susceptible to continuous grazing by large herbivores due to occurrences of surface water, as well as higher nutrient soils which offer more palatable trees, shrub and grasses.

Plate 4.3: Colophospermum mopane found in CH/12

4.17.3 Veld condition assessment revealed that this community is generally in poorer condition that the sandveld plant community in the central and eastern parts of CH/12. Here the condition of the veld is correlated to the distance from permanent water, with the veld in fair condition mostly being distant from permanent surface water. Areas within this plant community, especially near the surface water points and pans, seem to have been over-utilised and the soils compacted through trampling. This has resulted in incidences of the 'piosphere effect', a concentric outward radiation of herbivore pressure away from water points (See Plate 4.4). The piosphere effects arise from the combined effect of sustained grazing, trampling, defecation, and urination by wildlife resulting in the depletion of vegetation cover around water points. Accordingly, the current spatial pattern of grazing pressure should be fully recognized as an issue leading to deterioration of the veld condition in the *Colophospermum mopane* (Mophane) plant community.

Plate 4.4: Herbivore congregation around water point

4.17.4 Generally, the situational appraisal revealed that vegetation of the *Colophospermum mopane* (Mophane) plant community is more subjected to grazing pressure than the *Terminalia sericea* (Mogonono) plant community. However, in comparison with the *Acacia* communities it seems to be

in a generally healthier condition. This plant community requires sustained adaptive management to protect or restore the threatened biodiversity and natural ecological processes.. This challenge is made more difficult by the inherent sensitivity of this plant community to herbivore pressure and unpredictable rainfall.

4.17.5 From the vegetation evaluation exercises in CH/12 (DIES, 2012), it was observed that the general veld condition of this plant community deteriorated from 2004 to 2006, improved in 2007, and deteriorated again in 2008, improved in 2009, 2010 and 2011, and again deteriorated in 2012 most likely because of rainfall variability and grazing pressure.

4.17.6 There is also evidence that the *C. mopane* (Mophane) plant community is experiencing changes in vegetation composition (DIES, 2012). These include changes from perennial to seasonal grass species and increases in bush density spotted in certain areas, especially around permanent artificial water points. These changes are becoming a subject of growing concern as they appear as the product of the synergies between climatic variability (e.g. drought condition recorded in the 2003/04, 2005/06 and 2006/07 seasons), as well as the spatial expression of increasing large herbivore utilisation pressure. The recovery of the rangeland conditions in this vegetation community is possible, but only if the "average-to-above average" rainfall occurs for some successive years and if intervention to moderate large herbivore utilisation and bush encroachment in the plant community are implemented.

Ecological Characteristics and Importance of *Colophospermum mopane* (Mophane) Plant Community

4.17.7 Ecological characteristics and importance of *Colophospermum mopane* (Mophane) community are summarized below:

(i) Woody and herbaceous vegetation of the *Colophospermum mopane* plant community has been observed to be one of the most important resources for large herbivores in the concession area. It is known for supporting large communities of ungulates and some of the most significant wildlife populations of such as Elephant, buffalo, wildebeest, giraffe, kudu and at times hippopotamus. Predators such as lions, leopard, spotted hyaena, and wild dog have also been sighted within this plant community. Most natural pans are found in this community;

(ii) This vegetation community is associated with fertile soils of good clay content supporting palatable grass species, notably *Sporobolus fimbriatis, Digitaria eriantha, Brachiaria nigropedata, Eragrostis superba, Cenchrus cilliaris,* and *Eragrostis viscosa*. Grasses are generally palatable throughout the wet season and into dry season due to relatively high mineral and nutrient content, as determined by soil characteristics. However, low moisture content may limit use of grasses into the dry season, more so than in the Acacia plant community. Consequently grazing tends to be quantitatively limiting.

(iii) Rich in protein and phosphorous, *C. mopane (Mophane)* trees are key food sources for elephant and other browsers and the leaves retain their nutritional value to some extent even after leaf senescence and shedding;

(iv) Due to the high grazing pressure, this community does not accumulate high fuel loads, leading to low fire occurrence except in years of exceptionally high rainfall. Generally, this vegetation community is low to moderately prone to veld fires.

(v) Monitoring of vegetation points throughout CH/12 revealed that the average grass palatability index in this vegetation community has slightly decreased from 50% in 2010 to 48.6% in 2012. The effects of grazing and rainfall variability on the degradation gradient were adjudged as the most likely determinant;

(vi) It was also observed that the *C.mopane* plant community is relatively resilient and capable to recover condition to greater extent after good rains. Although the woody component is slow growing the coppicing ability of *C. mopane* creates some measure of resilience against elephant damage;

(vii) *Colophospermum mopane (Mophane)* is also highly valued for its wood that is commonly used in construction of houses and fences because of its great durability and resistance to termites, and as firewood because of its excellent burning and ember properties. It is considered as a true multipurpose tree, not only important for its wood but also as a source of medicine, forage and the edible caterpillars *Gonimbrasia belina*. Protection measures should be explored and implemented to attain sustainable exploitation of mopane species, which is one of the most characteristic indigenous trees in the concession area and region.

Tourism Value of *Colophospermum mopane* (Mophane) Plant Community

4.17.8 Tourism value of *Colophospermum mopane* (Mophane) plant community are summarized below:

(i) In CH/12, *Colophospermum mopane (Mophane)* community plays a crucial role as its foliage is an important browse component for many wild herbivores such as elephant, eland, kudu and impala which amongst others feed on fallen leaves and fruits of *C. mopane (Mophane) trees.* Accordingly, it does provide relatively good game viewing opportunity. Elephants are a common sight in *C . mopane* (Mophane) woodlands.

(ii) Wildlife is also attracted to this vegetation community during the rainy season due to the presence of natural pans in the summer, making it a relatively prime game viewing community;

(iii) *Colophospermum mopane (Mophane)* is one of the most characteristic indigenous trees in the region in general and CH/12 in particular. It is an important species in savanna and woodland ecosystems;

(iv) Similar to other woodland vegetation communities found in CH/12, *C.mopane* (Mophane) community contribute to the tourism product of CH/12 by providing a good wilderness and solitude experience that can be enjoyed by tourists and nature enthusiasts.

4.18 *Combretum hereroense* (MOKABI)– *Combretum imbebe* (MOTSWERE) PLANT COMMUNITY

4.18.1 This community which covers about 5% of CH/12 is characterised by *Combretum hereroense* (Mokabi) and *Combretum imberbe* (Motswere) species. The herb layer of this community is well developed with species of good forage value. It is associated with dark grey, high clay-content soils and pans. These areas have an open low woody structure with a good tall grass cover.

4.18.2 It was observed that despite some deterioration in rainfall, the veld condition in the *Combretum hereroense* (Mokabi)– *Combretum imbebe* (Motswere) *plant* community remains good. Vegetation indicators that suggested good veld conditions include; a healthy stand of natural pastures, plant cover, vitality of grasses, vitality of seedlings, abundance of organic material and good species composition. A deterioration of species composition is mainly attributed to an increase in opportunistic rainfall-driven species.

Plate 4.5: Combretum hereroense and Combretum imberbe found in CH/12

Ecological Importance of *Combretum hereroense* (Mokabi) and *Combretum imberbe* (Motswere) Community

4.18.3 Ecological characteristics and importance of *Combretum hereroense* (Mokabi) and *Combretum imberbe* (Motswere) community are summarized below:

(i) Woody and herbaceous vegetation of *Combretum hereroense (*Mokabi*) and Combretum imberbe (*Motswere*)* community in CH/12 provides habitat for a variety of fauna including insects, reptiles, birds, and mammals. The leaves are eaten by kudu, impala, elephant, giraffe. Giraffe and elephants consume the branches as well. The presence of *Combretum imberbe* (Motswere) can indicate good quality grazing.

(ii) This vegetation community is associated with fertile soils of high clay content supporting palatable grass species, notably *Digitaria eriantha, Brachiaria nigropedata, Eragrostis rigidior, Cynodon dactylon*, and *Eragrostis viscosa*. Grasses are generally palatable throughout wet season and into dry season due to relatively high mineral and nutrient content, as determined by soil characteristics.

(iii) While most of C*ombretum spp*. are small – to - medium sized trees or shrubs, the *Combretum imberbe* (Motswere) is one of the largest trees in Africa, capable of attaining a height of 20 meters with a canopy spread that is almost as wide. It is the largest tree in the region in general, and CH/12 in particular;

(iv) This community is of significant ecological value since it provides good browsing and grazing for wildlife found in CH/12. Due to the selective grazing pressure, this plant community does not accumulate high fuel loads, leading to low fire occurrence except in years of relatively high rainfall.

Tourism Value of *Combretum hereroense* (Mokabi) And *Combretum imberbe* (Motswere) Plant Community

4.18.4 The tourism value of *Combretum hereroense* (Mokabi) and *Combretum imberbe* (Motswere) plant community are summarized below:

(i) The *Combretum hereroense – Combretum imberbe* community does provide relatively good game viewing opportunity due to the presence of good forage resources and natural pans which provide reliable surface water for wildlife use particularly in years of high rainfall.

(ii) This plant community adds to the diverse scenery of the concession thereby contributing significantly to the solitude experience of CH/12.

4.19 RANGE/VEGETATION RESOURCE UTILISATION IN CH/12

4.19.1 CH/12 is among the areas endowed with a diversity of vegetation resources which include thatching grass, firewood, and wood-derived construction material such as timber. From a socio-economic stand point thatching grass is the most important vegetation resource currently utilised in CH/12. The most common species harvested in the area is *Eragrostis pallens* (Motsikiri) and to a lesser extent *Stipagrostis uniplimus*. Open grasslands supporting extensive patches of thatching grass species are widely distributed within the *Terminalia sericea* (Mogonono) -*Burkea africana* (Mosheshe/Monato) community.

4.19.2 Thatching grasses are harvested for both domestic use and commercial purposes. Local communities from Pandamatenga, as well as people from other parts of the country (notably from the Chobe, Central and North-East districts) settle temporarily to cut thatching grass in CH/12. Problems associated with these grass harvesters which were reported in the past include littering, poaching, and stealing of diesel fuel from borehole pumps.

4.19.3 It was furthermore reported that grass cutters set fires at the end of the grass-cutting season to remove moribund plant material to ensure a good new crop of grass for the following grass-harvesting season.

4.19.4 Another major natural resource utilisation concern is the short and long term ecological and socio-economic impact of grass cutting in CH/12 that is largely unknown and requires further investigation. Currently there are no strong regulatory mechanisms except for observance and control of grass cutting season which starts from July and ends in October each year.

Plate 4.6: Grass Cutters' Camp along Nata – Kazungula (A-33) Road

4.20 WILDLIFE OF CH/12 IN RELATION TO THE TOURISM PRODUCT

4.20.1 CH/12 and the surrounding concession areas support a high diversity of wildlife resources. Wildlife species found in CH/12 include steenbok, (*Raphicerus campestris*), common duiker (*Sylvicapra grimmia*), the African savanna elephant (*Loxodonta africana*), giraffe (*Giraffa camelopardalis*), kudu (*Tragelaphus strepsiceros*), warthog *Phacochoerus africanus*, Burchell's zebra (*Equus burcellii*), buffalo (*Syncerus caffer*), impala (*Aepyceros melampus*), roan antelope (*Hippotragus equinus*), eland (*Taurotragus oryx*), gemsbok (*Oryx gazella*), sable antelope (*Hippotragus niger*), hippo (*Hippopotamus amphibius*), lion (*Panthera leo*), spotted hayena (*Crocuta crocuta*), Brown hyaena (H*yaena brunnea*), leopard (*Panthera pardus*); wild dog (*Lycaon pictus*), honey badger (*Mellivora capensis)*, Chacma baboon (*Papio ursinus*) ostrich (*Struthio camelus*), ground hornbill (*Bucorvus leadbeateri*), lappet-faced vulture *(Torgos tracheliotos)*, and B ateleur eagle (*Terathopius ecaudatus*. Historically, CH/12 and the surrounding concession areas (CT/1, CT/2, CT/3, CH/8, CH/11, and CH/13 were generally characterised by low wildlife densities and limited water resources. Water dependent species such as zebra and buffalo could only be found in the area during the rainy season when natural pans were filled with rain water. A list of some of the faunal species found in CH/12 is presented in Table 4.5

Table 4.5: Scientific, Local, and Common Names of Some Animals Found in CH/12

Animal Group	Scientific (Latin) Name	Common (English) Name	Local (Tswana) Name
Mammalian Herbivores	**Mammalian Herbivores**	**Herbivores**	**Dijatlhaga**
	Loxodonta africana africana	African savanna elephant	Tlou
	Aepyceros melampus	Impala	Phala
	Ceratotherium simum	White rhinoceros	Tshukudu e tshweu
	Diceros bicornis	Black Rhinoceros	Tshukudu e nthso
	Equus burchellii	Burchell's Zebra	Pitse ya naga/ Pitse e tilodi
	Giraffa camelopardalis	Giraffe	Thutlwa
	Hippopotamus amphibius	Hippopotamus	Kubu
	Hippotragus equines	Roan antelope	Kwalata e tshetlha
	Hippotragus niger	Sable antelope	Kwalatae ntsho
	Oryx gazella	Gemsbok	Kukama
	Phacochoerus africanus	Warthog	Mathinthinyane/Kolobe
	Raphicerus campestris	Steenbok	Phuduhudu
	Sylvicapra grimmia	Common Duiker	Phuti
	Syncerus caffer	Buffalo	Nare
	Taurotragus oryx	Eland	Phofu
	Tragelaphus strepsiceros	Kudu	Tholo
Carnivores	**Order Carnivora**	**Carnivores**	**Dibatana**
	Canis adustus	Sidestriped jackal	Sekgee/Rantalaje/Phokoje
	Canis mesomelas	Black-backed jackal	Phokoje wa mokwatla montsho
	Crocuta crocuta	Spotted hyaena	Phiri
	Felis nigripes	Black-footed cat	Sebalabolokwane
	Hyaena brunnea	Brown hyaena	Phiri
	Lycaon pictus	Wild dog	Letlhalerwa
	Mellivora capensis	Honey badger	Matshwane/Magogwe
	Panthera leo	Lion	Tau
	Panthera pardus	Leopard	Nkwe
	Papio ursinus	Chacma baboon	Tshwene
Reptiles	**Class Reptilia**	**Reptiles**	**Digagabi**
	Bitis arietans	Puff adder	Lebolobolo
	Dendroaspis polylepis	Black mamba	Mokwepa o montsho
	Dendroaspis viridis	Green mamba	Mokwepa o motala
	Kinixys lobatsiana	Leopard tortoise	Khudu
	Python sebae	African rock python	Tlhware
	Geochelone pardalis	Leopard tortoise	Khudu
	Varanus exanthematicus	Monitor Lizard	Kgwatlhe

Animal Group	Scientific (Latin) Name	Common (English) Name	Local (Tswana) Name
Birds	**Class Aves**	**Birds**	**Dinonyane**
	Accipiter spp.	Goshwak	
	Anas erythrorhyncha	African teal ducks	Sehudi
	Bucorvus leadbeateri	Ground hornbill	Lehututu
	Numida meleagris	Crested guineafowl	Kgaka
	Sarkidiornis melanotos	Knob-billed duck	Sehudi
	Struthio camellus	Ostrich	Ntshe
	Terathopius ecaudatus	Bateleur eagle	Ntsu
	Torgos tracheliotos	Lappet-faced vulture	Lenong
Invertebrates/ Arthropods	**Arthropoda**	**Invertebrates/arthropods**	**Ditshidinyana**
	Family Isoptera	Termite	Motlhwa/Moruthwane
	Family Myriapoda	Millipede	Sebokolodi
	Family Scarabaeidae	Dung beetle	Khukhwane ya boloko/Pitike
	Gonimbrasia belina	Mopane Worm	Phane

4.20.2 However, three successive "road-counting animal surveys" conducted by DIES (2012) during 2010, 2011 and 2012 in CH/12 recorded a steady increase in the total number of wildlife sighted in the concession area, with average between-sighting times of one hour, and an average distance between sightings of over 11 km for all the surveys (Table 4.5). On average about 10 sightings were recorded during each survey. The most sighted animals were elephant and steenbok which were sighted over 20% of the time in all the three years. Animals which were sighted slightly over 10% include zebra, giraffe, and kudu.. The distribution patterns of elephants and most wildlife species changed drastically during 2006, and also in early 2008 and late 2009 (DIES, 2012). Wildlife species and population sizes have increased, even for rare species such as sable antelope, roan antelope, and wild dogs.

4.20.3 The increase in wildlife numbers over time is attributed to the provision of permanent surface water, which together with good veld conditions and forage from preferred plant species that is available in the concession area, aided the establishment of resident herbivore populations. Elephant and buffalo are currently the most notable large mammal species resident in CH/12. Giraffe, kudu, roan antelope, sable antelope and eland are also found in CH/12. Similar observations have been made in neighboring concessions of CT/1, CT/2 and CT/3 where artificial water points have also been provided (Ecosurv, 2012).

4.20.4 It should also be noted that the woody density at critical heights in the concession area is open enough for the habitat-sensitive species to occur. In addition, the increase in population sizes of large herbivores also positively correlated with large carnivore numbers. In this regard, spotted hyaena, lion, and leopard sightings were recorded and these animals have also become resident in CH/12. Wild dogs have also been sighted in CH/12.

Table 4.6: Summary of Animals Sighted in CH/12 during the 2010, 2011 and 2012 Ground Surveys

	2010	2011	2012
Total Time Spend Travelling	40.12 hours	52.58 hours	49.21 hours
Total Distance Travelled	412 Km	486.5 Km	509.2 Km
Total Amount of Sighting	35	62	51
Average Amount of Sighting/day	8.75	10.33	8.5
Average Distance between Sighting	11.4 km	12.41 km	11.79 km
Species Representation of Sightings	% of Sighting		
Steenbok	22.9%	20.6%	35.3%
Elephant	20.0%	25.6%	17.6%
Giraffe	11.4%	12.7%	21.6%
Kudu	11.4%	12.7%	21.6%
Warthog	11.4%	9.5%	3.9%
Zebra	8.6%	4.8%	2.0%
Buffalo	5.7%	3.2%	3.9%
Impala	2.9%	7.9%	7.8%
Roan antelope	2.9%	1.6%	2.0%
Bateleur	-	1.6%	-
Sable	-	1.6%	-
Ostrich	-	1.6%	2.0%
Lion	-	1.6%	1.6%
Honey badger	-	1.6%	-
Ground hornbill	-	1.6%	-
Gemsbok	-	1.6%	2.0%
% of Animals seen			
Steenbok	13.2%	3.8%	5.9%
Elephant	13.2%	21.9%	15.2%
Giraffe	22.1%	4.4%	9.0%
Kudu	14.7%	7.0%	1.1%
Warthog	8.8%	0.9%	0.8%
Zebra	19.1%	3.2%	0.8%
Buffalo	2.9%	44.0%	44.5%
Impala	2.9%	10.8%	21.4
Roan antelope	1.5%	0.6%	0.3%
Bateleur	-	0.6%	-
Sable	-	0.3%	-
Ostrich	-	0.3%	0.3%
Lion	-	1.2%	1.2%
Honey badger	-	0.3%	-
Ground hornbill	-	0.3%	-
Gemsbok	-	0.3%	0.6%
Total Amount of Animals seen	68	343	355

Source: 9th Ecological Evaluation of CHA CH 12, Envirodel, 2012

4.21 ABUNDANCE AND DISTRIBUTION OF LARGE HERBIVORES IN CH/12

4.21.1 CH/12 is an extensive area that is strategically situated in the eastern parts of the Northern Botswana Wildlife System. It is important to understand the ecological processes within the larger ecosystem before specific aspects can effectively be addressed on a smaller scale. It is also essential to understand the importance of this area in the larger system that is part of the Kalahari Basin Drainage System. This system covers most of the Northern and Central Botswana and is centered on the Great Makgadikgadi Salt Pans.

4.21.2 During the ecological appraisal of CH/12 (DIES,2012) it was observed that movement of wildlife in and out of CH/12 is largely influenced by availability of water and food resources. During the dry season, large water dependent herbivore species, concentrate around permanent artificial water points found predominantly within the mopane woodlands and acacia pan system of CH/12. During the wet season, large herbivores distribute themselves widely within the CH/12 and the surrounding concessions (CT/1, CT/2, CT/3, CH/8, CH/11, CH/13)

4.21.3 It should also be noted that CH/12 lies within the active Chobe-Hwange Wildlife Corridor which links the Chobe National Park and Hwange National Park in Zimbabwe. The Chobe-Hwange is an active corridor, especially for elephants, buffalo, zebra, wildebeest, roan antelope, sable antelope and eland. Observation have furthermore revealed that CH/12 could be regarded as primarily an elephant movement area which include:

(i) East–West movements between Chobe National Park , and Hwange National Park;

(ii) South- North movements from the relatively dry Wildlife Management Areas of Central and Chobe Districts towards the perennial Chobe/Zambezi River system.

4.21.4 While Figure 4.14 illustrates the present distribution of large herbivores in CH/12, Table 4.6 below provides a summary of their status in the concession area.

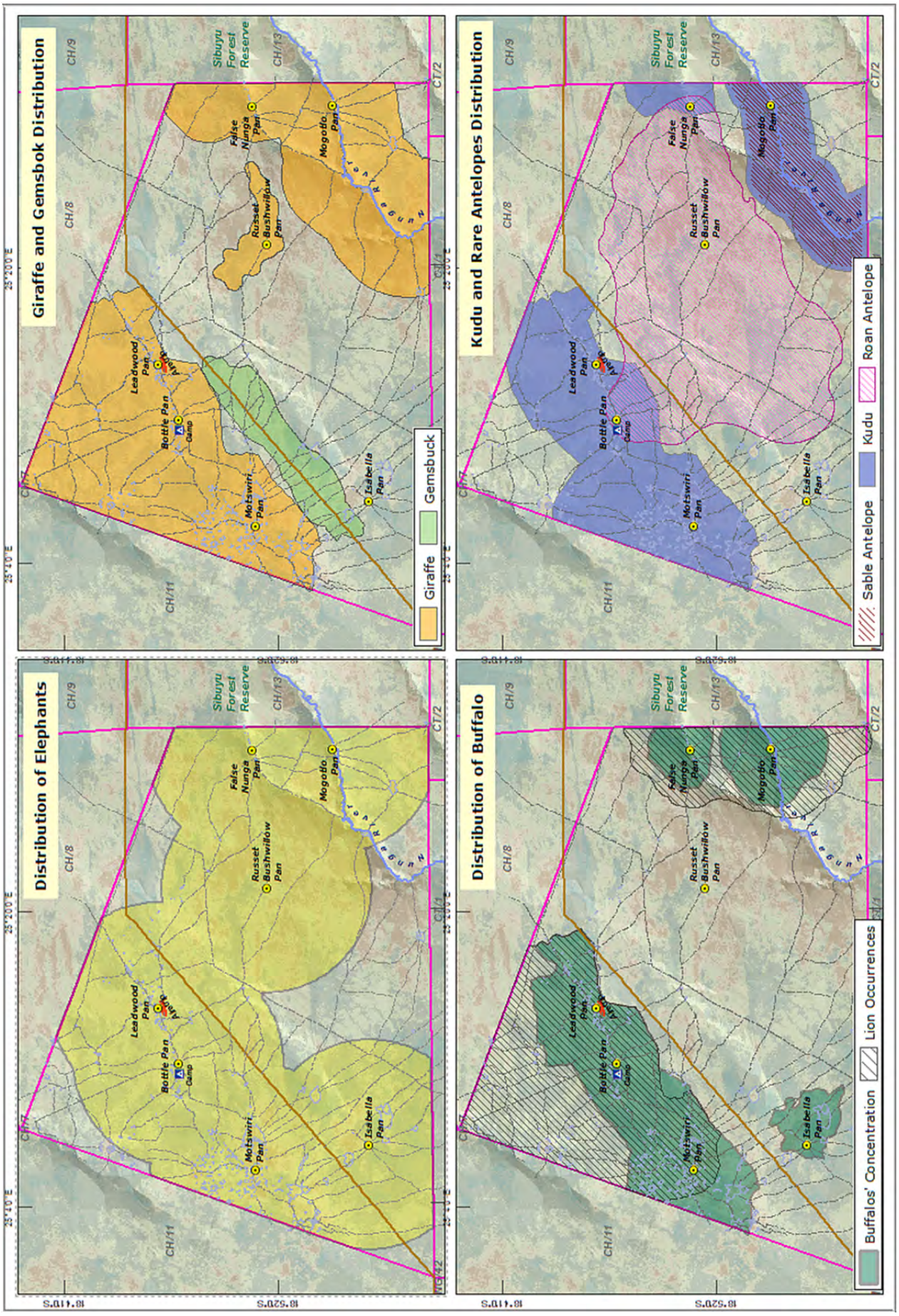


Figure 4.14: Present Wildlife Distribution

Table 4.7: Abundance and Distribution of Large Herbivores in CH/12

Herbivores	Distribution/ Status
Elephants	• Elephants are mixed feeders and surface water-dependent • CH/12 supports a high number of elephants that are widely distributed in the concession area during the wet season (December to April). • During the dry season (June – October), they concentrate within a 10 km radius of the artificial watering points where they can be found daily. • As far back as 2004, CH/12 was mainly a bull elephant area for the better part of the year. During those years female elephants moved out of the area from late April to early May when natural seasonal pans dried up. • With the establishment of functional and permanent artificial water points in CH/12, a high number of adult female elephants with young are now found in the concession area throughout the year. • Generally during the dry season elephant movement tends to be towards the perennial Chobe-Zambezi River system, while wet season movement tends to be east wards, in the direction of Hwange National Park in Zimbabwe. Elephants therefore, contribute significantly to the game viewing potential of CH/12.
Giraffe	• Giraffe are browsers and surface water independent • Giraffe are big charismatic animals found in CH/12 and the surrounding concession areas. • As surface water-independent species, the population and distribution of giraffe is not largely influenced by the artificial water points. • The population of giraffe in CH/12 is stable and distributed widely within the concession throughout the year. They are seen throughout the plant communities of *C. mopane (Mophane), Acacia, T. sericea (Mogonono)* and the Nunga/False Nunga system. • During field surveys, giraffe were observed in different vegetation communities, which is an indication of their wide distribution. The wide distribution within the concession also suggests high potential to contribute to the game viewing experience of CH/12.
Buffalo	• Buffalo are grazers and surface water-dependent • CH/12 is also known for its buffalo population, which has increased since the establishment of artificial water points. • It was observed that the population of buffalo in CH/12 grew more than ten- fold over the last nine years , most likely because the habitat had become more favorable for water-dependent species. In early 2004, there was a resident herd of only 30-40 buffalo in CH/12. Today the resident buffalo population in CH/12 is estimated to be around 400 – 600 animals at any time and could possibly be up to 800 individuals in the late dry season. • Within CH/12, the highest concentration of buffalo is found in the Mophane belt in the north western part of the concession area throughout the year, where a series of pans (Leadwood Pan, Bottle Pan, Motswiri Pan and Sunset Pan) are found. • During the late dry season bachelor herds ranging from 7-11 bulls are found regularly around Isabelle Pan. During the wet season big herds of buffalo range up and down the Nunga Fossil River, occasionally drifting into the Sibuyu Forest Reserve. • A bachelor herd is regularly observed drinking at the False Nunga during the dry season. • During the field visit a herd of close to 100 buffalo was also observed at Bottle Pan. The body condition of the buffalo was quite poor, suggesting that forage resources could be limited during the dry season. The range conditions are also affected by veld fires which remove significant amount of grazing resources for buffalo and other bulk grazers in CH/12.

Zebra	• Zebra are grazers and surface water-dependent • Although there are fair numbers of resident zebra in CH/12 (presumably due to permanent water provision) they are only found in small family groups of 6 – 8 individuals. Occasionally it is possible to see a family group of 12 zebra. • As bulk grazer which are able to subsist on coarse grasses, it is highly likely that the population size of zebra in CH/12 will increase over time as long as the artificial water points remain functional
Rare Antelopes (Roan Antelope, Sable Antelope, Eland)	• Both roan and sable antelopes are selective grazers and surface water-dependent. Over the last 9 years, roan antelope populations have increased, in abundance and distribution of family groups in CH/12 (DIES, 2012) • They occur in the *Terminalia sericea* (Mogonono) plant community system, mostly during wet season. During the dry season they regularly drink at Bottle Pan, False Nunga and Russet Bushwillow Pan where there is artificial water provision. • During the field survey a herd of 15 roan antelope was observed drinking at Bottle Pan. • Sable antelope are rarely seen in CH/12 before late August / September. They are mostly seen in the dry season around the False Nunga as single bulls or small groups. • Sable antelope are often seen coming to drink in the False Nunga River after September each year. It has been observed elsewhere, (e.g. Kruger National Park) that sable antelope are sensitive to competition. The increase in the number of resident herds of grazers in CH/12 and its vicinity is a threat to the population of sable antelope. • Elands are mixed feeders and water-independent, and have also been sighted in CH/12, but occur in low numbers.
Gemsbok and Steenbok	• Though rarely sighted, gemsbok could be spotted along the cutline between Bottle Pan and Isabella pan in the dry season • Gemsbok are mixed feeders and surface water-independent and have been located in limited numbers in CH/12 • Steenbok are commonly seen along cutline and tracks. Solitary or paired steenbok were observed browsing A. erioloba woodlands during the dry season after green herbs were no longer available. Steenbok are preferential browsers and prefer acacia savannas where low grass cover allows predator detection and escape
Kudu and Impala	• Kudu are browsers and surface water-independent, while impala are mixed feeders and water-dependent • Kudu and impala are seen daily at AWPs but it is not known if their populations would change if the AWPs were removed. Foraging observations of the more secretive kudu were limited to the woodland, where they browse year-round • The impala is a mixed-feeder that browses in the dry season. Impala herds forage primarily in woodlands and along ecotones but occasionally move >1km into the open grassland. Impala require water if the water content of forage is<30%. However, impala are rarely found more than a few kilometres from water
Warthogs	• Warthogs were sighted haphazardly within CH/12. Sightings were normally of family pairs with current offspring next to waterholes, but can be surface water-independent. • Warthog excavation activities while foraging for subterranean plant resources (e.g. stolons, tubers, and roots), notably in the Acacia, C. mopane, and Combretum plant communities provides a foundation for the creation of temporary pools that collect water during the rainy season and attract other wildlife species such as herbivores and carnivores. Animal defecations, urination, and trampling at these points not only modify the soil chemistry and physical properties that better support plant life, but further facilitate the deposition of seeds dispersed from afar, some of which successfully establish themselves around these excavated waterholes, and eventually modify the local biodiversity and transform the larger physical environment. • The foregoing scenario qualifies warthogs into the league of nature's ecosystem/environmental engineers, which contributes to the spatial heterogeneity of CH/12.

4.22 ABUNDANCE AND DISTRIBUTION OF LARGE CARNIVORES IN CH/12

4.22.1 As already mentioned, with the increase in resident prey populations in CH/12, the lion population is also expected to increase. However, lions are seldom seen in CH/12 during the wet season. In the dry season, definite patterns of movement are observed. There has been sighting of at least 3 resident males (3-5 years old) in the Mophane area near Leadwood Pan and Bottle Pan, and in areas within the vicinity of Motswiri Pan during the dry season. Observations have also revealed that there is also a coalition of male lions patrolling the Isabella Pan area in the southern part of the concession area. There is also a breeding pride of five lionesses that come into False Nunga and Mogotlho region around July every year.

4.22.2 Sighting of leopards have revealed that they are distributed throughout the concession area with a likely high density along the False Nunga and Nunga Fossil River system, especially in the dry season when they do drink regularly.

4.22.3 Observations have also revealed that spotted hyaena are rare sighting in the concession area with only three dens having been spotted in the area thus far.

4.22.4 It has been observed that a pack of 9-11 wild dogs annually spend at least 3 - 4 months of the year in CH/ 12 .

4.23 BIRDS

4.23.1 Most common birds found throughout the dry wildlife management areas in Northern Botswana can also be found in CH/12. Presently, prospective visitors may sight the following birds, during game drives through different landscapes of CH/12 :

(i) Crested guineafowl (*Numida meleagris*): These are mainly distributed throughout Mophane and Acacia zones, as well as False Nunga/Nunga Fossil River system;

(ii) Knob billed Ducks *(Sarkidiornis melanotos*): These have been sighted in the wet season in all the pans throughout the concession area;

(iii) African Teal Ducks *(Anas erythrorhyncha):* These have also been spottedin the wet season in all the pans throughout the concession area;

(iv) Doves (*Streptopelia spp.)* and Sand grouse (*Pterocles spp*.): These have been sighted during the dry season around waterholes , very often in high concentrations

(v) Goshawks *(Accipiter spp.)* and Lappet-faced Vulture *(Torgos tracheliotos)* .

4.24 AMPHIBIANS AND REPTILES

4.24.1 Most of the herpetons found throughout the dry wildlife management areas in Northern Botswana are also found in CH/12. The African Rock Python *(Python sebae),* Puff Adder *(Bitis arietans),* Black Mamba *(Dendroaspis polylepis),* and Green Mamba *(Dendroaspis viridis)* are among the common snakes found in CH/12. The Leopard Tortoise *Geochelone pardalis* and the Monitor Lizard *Varanus exanthematicus* can also be located in CH/12.

4.25 INVERTEBRATES

4.25.1 CH/12 is habitat to less charismatic but ecologically important soil fauna such as dung beetles, termites, and millipedes. Dung beetles and termites are some of the invertebrate soil fauna community commonly found in the semi-arid CH/12 environment. Millipedes on the other hand

are moisture-limited and only become surface active during the wet season. All three groups of organisms have significant effects on ecosystem structure and functioning in different but significant ways.

Dung beetles *(Insecta: Scarabaeidae)*

4.25.2 Dung beetles of the subfamily Scarabaeinae are important ecosystem engineers. Their functional importance in the ecosystems include soil fertilization and aeration, increased drainage, increased rates of nutrient cycling, prevention of rangeland wastage, and control of pest flies and internal parasites of mammalian herbivores. Besides these functions, dung beetles are useful indicators of ecosystem wellbeing. They are 'donor driven', i.e., they rely on other organisms in the community for resources, but do have significant effects on nutrient cycling and the distribution of nutrients within the ecosystem, and as such affect primary production. Many other specific dung beetle effects include improvement of water holding capacity, soil structure, soil chemistry, etc. In CH/12 dung beetles are some of the main agents responsible for facilitating the decomposition and conversion of large mammalian dung, notably that of elephant origin, into nutrients back into the soil profile for subsequent plant uptake.

Termites *(Insecta: Isoptera)*

4.25.3 Termites are also a part of the ecosystem engineer league of organisms. They are terrestrial and typical inhabitants of tropical, sub-tropical, and semi-arid regions such as CH/12 where they are often significant members of the invertebrate soil fauna. Because they have evolved the ability to modify their micro-environment within their nests and foraging galleries, termites have evolved to be the most successful detritivores in the seasonally dry tropics and savannas (Kaunda, 1994) such as that of CH/12. They are an important component of many ecosystems because they play a role in the flow of energy and nutrients at both the herbivore and decomposer levels. Termites also feature in the diets of many vertebrates within CH/12, as well as in the diets of some human societies. They have also been implicated in environmental damage through their herbivorous foraging activities on both living and moribund plant components. When considering the ecological role of these organisms, it is therefore important to note that this role depends on their population densities and biomass. The dominant termite species in the semi-arid Northern Botswana ecosystems belong to the subfamily Macrotermitinae, which are predominantly mound builders. These mounds reach maximum heights in the grassland and savanna woodlands of the Northern Botswana where they are often a diagnostic feature of the African landscape, contributing to its tourism appeal. Subterranean species also occur among the Macrotermitinae sub-family.

Millipedes (Diplopoda: Myriapoda)

4.25.4 Millipedes are generalist detritivores which are widespread and abundant in savanna woodlands of Southern Africa (Kaunda, 1994; Dangerfield and Kaunda, 1994). However, millipedes are moisture-limited, and as such their humificative functions in semi-arid savannas, characteristic of CH/12, are mostly performed during the rainy season when humidity is relatively high. Since microbial activity in savannas is also extremely moisture dependent and therefore seasonal, it follows therefore, that millipede effect on nutrient dynamics will likely fluctuate accordingly (Kaunda, 1994). Leaf litter is the main food item but other food items include soil, algae, and carrion (Kaunda, 1994). Upon consumption, leaf litter is converted from its original form to a new, potentially more decomposable form. The comminution of leaf litter by millipedes can enhance microbial activity, which may act as sinks or sources of nutrients through the processes of nutrient immobilisation and mineralization. Consequently, these organisms play a major role in leaf litter

turnover, regulation of decomposition processes, especially through their association with the soil micro-flora, and nutrient dynamics.

4.26 WILDLIFE SPECIES OF SPECIAL SIGNIFICANCE

4.26.1 There is number of wildlife species of conservation importance in CH/12. These species include rare, threatened, vulnerable and endangered species (Table 4.7). The African wild dog is the only endangered species found in CH /12.

4.26.2 It must however be noted that since CH/12 rests within a wildlife migratory area between Northern Botswana Wildlife System and Hwange National Park, there is a likelihood of sighting the near-threatened white rhino *(Ceratotherium simum),* and the critically endangered Black rhinoceros *(Diceros bicornis)*, both of which have the capacity to range for up to 300 km. Sechele (2007) reported that introduced white rhino home-range sizes in Moremi Game Reserve ranged 17-650 km^2, and some individuals were capable of moving over 250 km from their release site on Mombo Island in Moremi Game Reserve to be relocated in Nxai Pan National Park. Such extensive movements make it quite likely that white rhino could be sighted in the CH/12 concession area, and to a lesser likelihood, black rhino.

Table 4.8: Animal Species of Special Significance Found In CH/12

Critically Endangered	Endangered species	Near Threatened Species	Rare Species	Vulnerable Species
There are no critically endangered species resident in CH/12	African Wid Dog (*Lycaon pictus*) 	Brown hyaena (*Hynaena brunnea)* 	Roan antelope (*Hippotragus equines*)  Sable antelope (*Hippotragus niger*)  Eland (*Taurotragus oryx*) 	African elephant (*Loxondota Africana*)  Black-footed cat (*Felis nigripes*)  Lion (*Panthera leo*) 

4.27 IMPORTANCE OF WILDLIFE TO THE PHOTOGRAPHIC TOURISM PRODUCT IN CH/12

4.27.1 Although some wildlife species in CH/12 have steadily increased over years, their densities and distribution are yet to support a top class game viewing experience. CH/12 does not exist in isolation and it is part of the larger Northern Botswana Wildlife System which suggests that the area benefits from natural movement of animals from elsewhere. It is therefore critical to note that, though unnatural, the provision of artificial water points is vital to the tourism product of CH/12, notably during the dry season. For the photographic tourism to succeed, provision of artificial water points has to be sustained in CH/12, while taking concerted efforts to document the ecological impacts and implications associated with the intervention. Artificial water points have the potential to attract resident herds which can be viewed by tourists all year round. Specifically, during the field visit to CH/12 it was observed that elephants, buffalos, warthog, zebras, roan antelope, and sable antelope congregate at artificial water points where they could easily be viewed by tourists, especially during the dry season.

4.27.2 Four of the "Big Five" wildlife species (elephant, buffalo, lion, and leopard) are present in reasonable numbers throughout the year in CH/12. Rare and endangered species such as sable antelope, roan antelope, and wild dogs are regularly sighted, especially in the eastern and southern part of the concession area, suggesting a relatively rewarding game viewing experience for tourists.

4.27.3 However, existing records of road sightings as reported by DIES (2012) suggest that CH/12 is still to offer higher game sighting encounter rates and game viewing potential which is actually expected once the resident wildlife habituate to non-consumptive tourism, given the transition from a history of hunting within the concession area.

4.28 CHALLENGES AND ISSUES OF WILDLIFE MANAGEMENT IN CH/12

Wildlife Monitoring

4.28.1 The major challenges of managing wildlife in CH/12 and the Northern Botswana Wildlife System at large is the lack of comprehensive inventories of wildlife and natural resources and their interactions, in particular the paucity of ecological data such as genetics, distribution, behaviour, demography, and ecosystem functioning. Data on population trends are scanty although some indicators show that some species are increasing while others are decreasing (Chase, 2011). The DWNP has limited human and financial resources to conduct comprehensive inventory and monitoring of wildlife resources on its own. However, great potential lies in the collaboration and cooperation between DWNP, the private sector (particularly those practising tourism business), and research institutions. A typical example is the long-term ecological evaluation that has been conducted in CH/12 by Bottlepan Safaris (DIES, 2012). For CH/12, two key potential areas for research projects stand out from the two existing management interventions in the concession area: artificial water provision and hunting. First, would be the documentation of "before and after" environmental and ecological changes brought about by provision of permanent water points. Second, is the documentation of the relative impacts of hunting, including the reported looming stoppage thereof, on various target species and other wildlife, across levels of biological organisation.

Poaching

4.28.2 Illegal hunting remains a major concern and challenge in Northern Botswana in general, and the Chobe District in particular, suggesting that potentially, CH/12 could also be under threat given the recent proliferation of illegal hunting in Northern Botswana's protected areas and beyond. CH/12

is located a considerable distance away from settlements but can be easily accessed by four-wheel-drive vehicle. Although poaching incidents in CH/12 have remained minimal, it is possible that some level of poaching goes unnoticed, particularly during the grass-harvesting season. It was noted during the field survey and stakeholders' consultation that reports of poaching incidents are relatively minimal in CH/12. Currently there is limited anti-poaching activity in the concession area, which may suggest that poaching activities could also potentially escalate in CH/12.

4.29 ARTIFICIAL WATER PROVISION FOR WILDLIFE

4.29.1 CH/12 has limited permanent surface water for use by wildlife since soils are predominantly deep and sandy, thereby offering very little potential for natural pans. Surface water under natural conditions is only found in pans and depressions in fossil river and mophane woodlands after rains. Provision of artificial water points in CH/12 is therefore a major management intervention. Currently there are seven artificial water points, six of which are operational. Permanent artificial water provision is through pumping water into existing natural pans. Since 2004, five boreholes have been drilled and three artificial water points have been created (Table 4.8). Two of these boreholes, one near the Bottle Pan Camp and the other in the southern Nunga area, are dry. Further details of the permanent artificial water points are presented in Table 4.8:

4.29.2 As can be gleaned from Table 4.8 water provision has progressively increased since 2004. The oldest pans that are used as artificial water points are Motswiri Pan, Bottle Pan, and the False Nunga Pan, all located in Mophane woodland where seasonal surface water is available in most years. The rest of the boreholes were drilled and commissioned after 2004. The water levels in the pans are almost kept constant through pumping water from boreholes. However, the water levels at pans differ from year to year due to variation in rainfall and rainwater collection. With the high rainfall of 2008, 2009, and 2010, water levels were especially high.

4.29.3 It should be emphasised that the water point sites are aesthetically acceptable as they mimic the natural conditions. These water points are quite effective and are regularly used by resident and migratory wildlife species. The quality of water in all artificial water points in CH/12 is good, except for two AWPs which yield salty water (Motswiri and Isabella Pans).

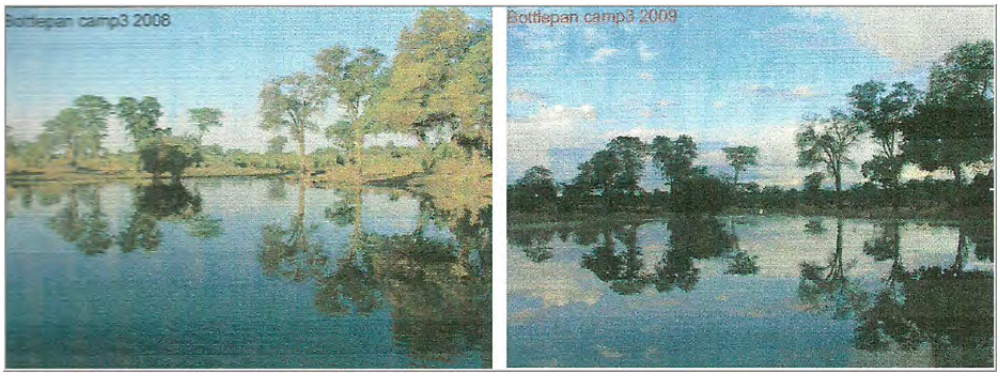


Plate 4.7: Bottle Pan- One of the most attractive artificial water points in CH/12 (wet season)

4.30 POSITIVE AND NEGATIVE IMPACTS OF ARTIFICIAL WATER POINTS IN CH/12

Challenges of Provision of Artificial Water Points in CH/12

4.30.1 Provision of water for wildlife is one of the difficult and expensive management interventions in CH/12. According to DIES (2012) it costs over P 500, 000 per annum to run the current artificial water points in CH/12. However, this figure is likely to drop considerably when cheaper modern technology such as the use of solar power is introduced to power boreholes. The current operational costs are not only because of the remoteness of the area, but because of the low rainfall

and the increased large numbers of animals, especially buffalo and elephants that utilize these permanent water points.

Table 4.9: Details of the Permanent AWPs in CH/12

	Pan/Water point Name	Year Established	Age	Location within plant community	Characteristics (as per field visit, conversation, and photo panoramas, and DIES 2012)
1.	**Bottle Pan**	During mid-1960's	>40 years	Mophane	• Good water quality • Also provides water to the Camp and for staff use • Originally established to supply water for cattle trekked from Ngamiland for sale in Livingstone • Tree damage increased in 2011 and 2012 • Woody plant species composition decreased to 4 species in 2012
2.	**Motswiri Pan**	1999/2000	8-12 years	Mophane	• Fairly salted and problematic since 2004 • Borehole finally collapsed in 2005 • New borehole drilled, but no water found • Pan was dry in 2005, only filled with rainwater in 2005 • Borehole fixed in 2006 and is in full operation • High impact on vegetation due to high animal densities in 2011 and 2012 • Woody plant species composition at waterhole decreased to 3 species in 2012 • Reports of hippo sighting here during 2006, 2007, and 2011
3.	**False Nunga Pan**	1999/2000	8-12 years	Mophane	• Good water quality • Damage increased in 2011 and 2012 • Damage declined away from the pan
4	**Old Solar Panel Pan**	2005	7 years	Combretum	• Good water quality • Utilised for only one year and closed in 2006 • Impact is minimal and regarded as normal for a seasonal pan
5.	**Mogotlho Nunga Pan**	2005/2006	8 years	Acacia	• Good water quality • Highly impacted with large trees eradicated in 2012 • More open in 2008, 2009, 2010, 2011, and 2012, than 2007
6.	**Russet Bushwillow Pan (New Solar Pump Pan)**	2006/2007	6 years	Combretum	• Good water quality • Less severe impact on vegetation • In 2012 area away from pan is 7.8% more open than at the pan • Plant species composition at the pan much lower than away from the pans • Damage increased at pan in 2011 • Lower height class more prominent than higher height classes in 2012 • Damage decreased slightly away from pan
7.	**Leadwood Pan**	2006/2007	6 years	Mophane	• Good water quality • Water levels significantly higher in 2008-2010 than in 2007 • Impact before 2011 less severe • In 2011, there was severe impact • Large Leadwood tree also died in 2011
8	**Isabella Pan**	2008	4 years	Acacia	• Good water quality • Severely impacted (after four years) • 19% of trees surveyed were dead in 2012 • Most *A. luederitzii* trees were damaged in 2012 • No large trees recorded

Positive Impacts of Artificial Water Points in CH/12

4.30.2 The presence of artificial water has a significant impact on the development of the tourism potential and utilization options within CH/12, an otherwise low photographic tourism area. Through the provision of artificial water points, the habitat suitability of the area for several water-dependent species has been enhanced and this resulted in an increase in wildlife numbers and the photographic tourism potential CH/12. Water points provide focal points for tourists, and so enhance the economic viability of the conservation areas.

Negative Impacts of Artificial Water Points in CH/12

4.30.3 A significant body of literature revealed that water points pose a threat to biodiversity. Potential impacts of artificial water points in CH/12 include the increase in population of water-dependent species at the expense of rare ones in the short term. It was furthermore noted that while the establishment of resident herds within CH/12 is a positive development from a photographic tourism viewpoint, abundant water supplies may support increased stocking levels of ungulates in the short term but at a cost of the populations' ability to survive severe droughts in the long term.

4.30.4 During the field survey some of potential adverse consequences of artificial water points in CH/12 have been observed. They are mostly related to:

(i) Incidences of soils and vegetation degradation and habitat modification around water points;

(ii) Domination of elephants around water points, limiting access to water resources to the detriment of lesser herbivores

4.31 VELD FIRE IN CH/12

4.31.1 Fire is a common phenomenon and problem in CH/12. The fire season in CH/12 usually runs from June to November. There are two main sources of ignition in CH/12, namely, lightning which occurs during the dry thunderstorms at the beginning of the rainy season (October–November), and fires set by people (arson) for various purposes.

4.31.2 It has been observed that within the Chobe District, fire occurrence is common during the dry season in the Greater Pandamatenga area that abuts CH/12. Fire records from Chobe District indicate that the wild fires are almost exclusively started by people. Most fires occur in August-September window, suggesting that fires are not caused by lightning since no thunder storms occur during that period (Map 4.3). It was noted that the causes vary widely, but known and suspected sources of ignition include; campfires, discarded cigarettes, vehicle fires, hunters, safari expeditions and wildlife poachers. Grass cutters are particularly known for burning old moribund grasses to facilitate the emergence of new grass shoots.

Plate 4 8: Veld Fire Scars in CH/12

4.31.3 Most fires in CH/12 burn under hotter ambient conditions (e.g. October / November) under high grass fuel loads. Such fires are quite destructive and are known to kill trees and shrubs, and damage the growing meristems. This is exacerbated by the likelihood that plants would already have re-mobilised stored resources towards outer stem extremities in the form of buds and flowers, in anticipation of the start of the main rainy season (December). Grasses, by contrast, are less prone to irreversible damage, because their growing meristems are sometimes below ground surface.

4.31.4 There is evidence that fire continues to cause dramatic vegetation change in CH/12, particularly in the *Terminalia sericea* (Mogonono) - *Burkea africana* (Mosheshe/Monato) community where grass fuel load is always high even under years of relatively low rainfall. It is highly likely that the hot fires that have been occurring in CH/12 and the surrounding areas over many years have affected plant diversity. Loss of woody vegetation cover may be replaced by either grasses (in the case of moist areas where grasses have a competitive advantage), or by a new phase of woody plant regrowth (in the case of drier areas where deep tap roots of for example *T. sericea* (Mogonono) have a competitive advantage). There is evidence that previously tall woodlands in some parts of CH/12 and the surrounding concession areas have been transformed into low dense scrub and open grasslands. This habitat transformation favoured some ungulates, particularly those that require relatively open space that facilitates enhanced predator detection.

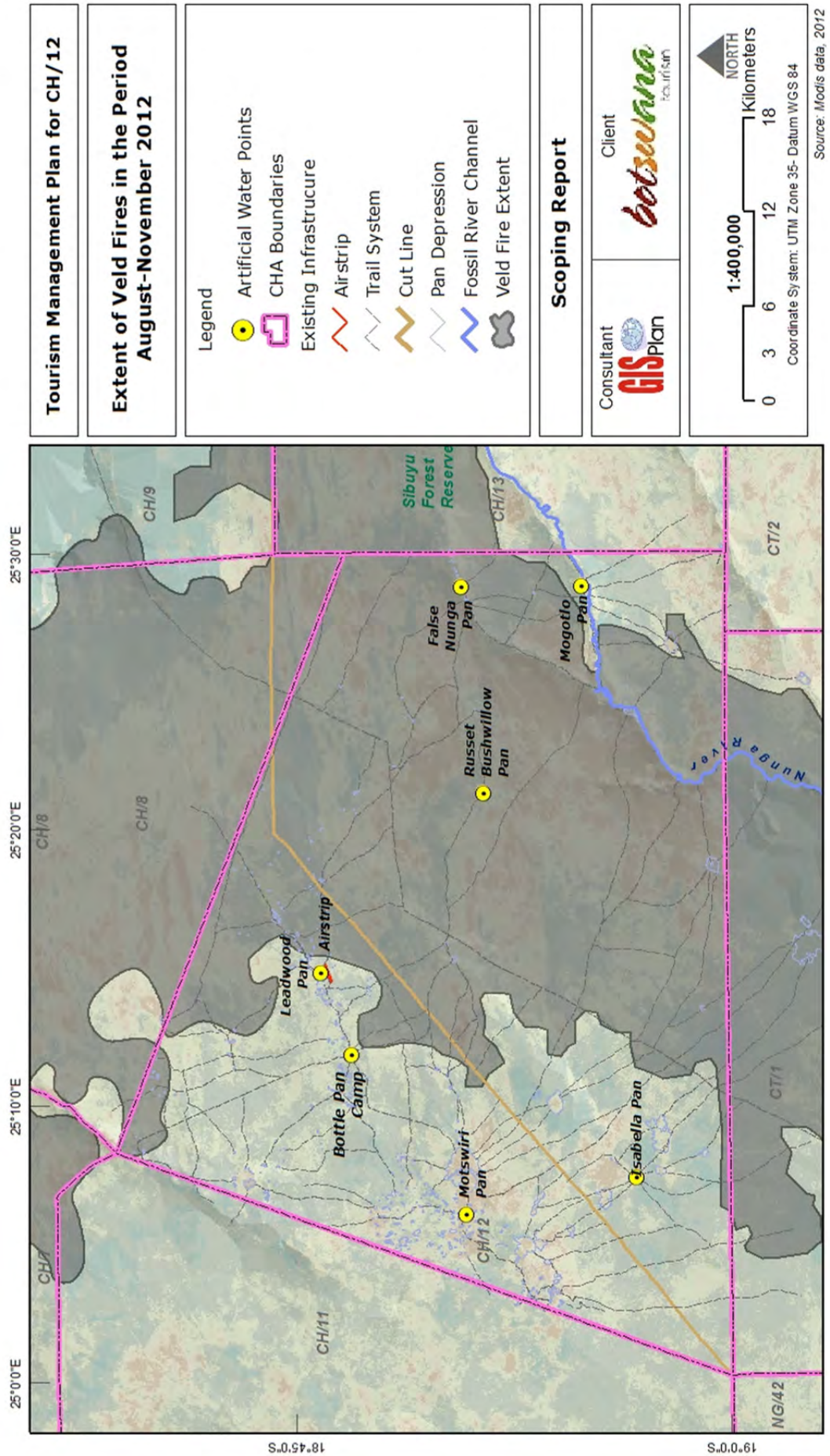
Ecological implications of veld fires in CH/12

4.31.5 The ecological implications of fires are summarized below:

(i) The common incidents of fires in CH/12 suggest that fire plays a significant role in the ecological functioning of systems found in CH/12. Specifically, the frequency of fires is considered very important and must be monitored and controlled. When the frequency of fires is too low, the fuel loads become too large and very hot destructive fires may occur. Large trees are then affected and tree mortalities escalate. The only practical way of lessening the occurrence of such events is to employ a burning programme of so-called "cool fires", so as to prevent high fuel loads from accumulating, thereby limiting the potential for large trees destruction and fire spread.

(ii) The removal of dry moribund grasses by fire affords herbivores in CH/12 access to high quality forage resources, thus reducing the nutritional stress endured by herbivores. Fire stimulates grasses and forbs to grow, attracting grazing herbivores and altering their spatio-temporal distribution within CH/12 and the surrounding Concession Areas. Fire enables nutrients trapped in dead woody and herbaceous plant material to be released, thereby enhancing the nutrient status of the already nutrient poor soils such as those found in the *Terminalia sericea* (Mogonono) - *Burkea africana* (Mosheshe) community.

(iii) It was also noted that rainfall and grazers have and continue to influence the fire regime and its effect on habitats. Rainfall is a primary determinant of the rate of grass fuel load accumulation whilst grazers have the opposite effect. With regard to this, it was observed that the lack of fire in the Mophane and Acacia zones within CH/12 can be attributed to excessive utilization of grass biomass by herbivores, thus significantly reducing accumulation of fuel loads. On the other side, the T. *sericea* (Mogonono) plant community which dominates in CH/12 is less palatable and animals do not utilize it to the same extent as the palatable areas. This, in turn is likely to trigger accumulation of high fuel loads which usually ignite when conditions are most favourable for fires (i.e. high, dry fuel loads and high ambient temperatures –most likely to occur in the late dry season)



Map 4.3 Veld Fire Extent in the Period August-November 2012

(iv) It is clear that the driving forces of CH/12's ecosystem, namely rainfall, surface water, fires and hebivory, need to be monitored and adaptively managed. A strict "No Fire Policy" for the CH/12 is ultimately unsustainable and likely to result in continued ecosystem damage and loss of tourism and resource use potential.

4.32 SUMMARY OF BIODIVERSITY STATUS OF CH/12 AND ITS IMPLICATIONS ON TOURISM

Biodiversity Indicators

4.32.1 The biodiversity of CH/12 is in good condition based on species abundance and distribution as the main indicators of biodiversity status. Most of the species which are expected to be present in CH/12 have been sighted. However, sable antelope and roan antelope occur in relatively low densities, while elephants, zebra and buffalo occur in relatively good numbers, and are widely distributed throughout the concession area owing to the provision of artificial water points which facilitates the establishment of resident herds. Most of the dryland bird species and reptiles that occur elsewhere in the dry woodland savannas of the Chobe District do occur in CH/12. Except for seasonal grass cutting and wood-based construction materials, there is no evidence of other harvesting of vegetation resources in the concession area that could threaten the biodiversity of CH/12.

4.32.2 Uncontrolled fires remain the main threat to biodiversity mainly because some of the fires burn under high temperatures which results in extensive damage to vegetation and other life forms.

Biodiversity and the tourism product of CH/12

4.32.3 From a tourism standpoint, biodiversity of the CH/12 has potential to support photographic safaris due the presence of a variety of mammals, birds, reptiles, invertebrates, and different types of flowering plants. However, birdlife is limited particularly during the dry season. It is important to note that emphasis in the concession should be placed on the wilderness experience, notably the solitude it offers. Such wilderness experience can be enjoyed through foot safaris during which wildlife sightings would be possible. In addition to this, the spatially heterogeneous vegetation of CH/12 contributes significantly to the scenic beauty of the area, particularly during the rainy season when there is lush green vegetation.

5

Existing Land Use and Infrastructure

CHAPTER 5: EXISTING LAND USE AND INFRASTRUCTURE

5.1 TYPES OF LAND USE IN CH/12

5.1.1 As illustrated in Map 5.1 the prevailing (or rather, only) land uses and activities in CH/12 are those related to tourism in the form of trophy hunting safaris. Specifically, CH/12 is presently designated as a single use concession and is operated as a non-resident consumptive tourism concession. The lease for CH/12 is currently granted to Bottle Pan Safaris which has for the past seven (7) years conducted safari (trophy) hunting in the concession.

5.1.2 As already mentioned no community lives or has any direct connections within CH/12. The concession is, in this regard relatively protected from human interference that might endanger its natural "unspoiled and wilderness" character. Veld products utilization in CH/12 may involve thatching grass harvesting by people from different parts of Botswana.

5.1.3 CH/12 is at present utilised for safari hunting operations. These operations are seasonal in nature and in CH/12 are carried out between the months of April to September every year. The DWNP has been responsible for setting the hunting quotas and the hunting season. As illustrated in Table 5.1, the principal consumptive tourism activity offered in CH/12 is an exclusive trophy hunting for which 30 hunts are being recently marketed per year. Of the species that were included in the hunting quotas of 2004 to 2012, elephant, buffalo, kudu and impala were the most important hunting species in CH/12. However, given the structure of hunting quota allocations it is clear that the concession is being used for elephant trophy hunting almost exclusively.

Table 5.1 Hunting quotas allocated to CH/12 from 2004 to 2012

Animal Species	2004	2005	2006	2007	2008	2009	2010	2011	2012
Baboon	10	10	7	7	7	7	7		
Buffalo	2	2	2	2	2	2	4	2	1
Eland	2	2	2	2	2	1	1		
Elephant	6	10	12	14	16	18	22	23	23
Gemsbok	1	1	1	1	2	2			
Hare, Cape	10	10	5	5	5	5	5		
Hare, Scrub	10	10	5	5	5	5	5		
Hyaena, Spotted	2	2	2	2	1	1			
Impala	3	3	3	3	3	3	5	5	5
Jackal, Black-backed	5	5	3	3	3				
Jackal Side- striped	1	1							
Kudu	2	2	2	2	2	2	2	1	1
Leopard	2	1	1	1	1				
Lion		1	1	1					
Monkey, vervet	5	5	2	2	2	2	2		
Porcupine	5	5	2	2	2	1	1	1	
Steenbok	14	14	9	9	9	5	5		
Warthog	2	2	2	2	2	2	2		
Zebra	2	2	2	2	2	2	2		
Wildebeest	2	2	2	2	2	2	2		
Total	**89**	**93**	**66**	**68**	**68**	**61**	**67**	**31**	**30**

Source: 7th Ecological Evaluation of CHA CH/12, DIES, 2012

5.1.4 The appraisal of the current situation revealed that the demand for elephant trophy hunting (together with allocated elephant's hunting quotas) can economically sustain CH/12 (including maintenance cost for 7 permanent artificial water points).

5.2 TYPES AND ADEQUACY OF INFRASTRUCTURE DEVELOPMENT

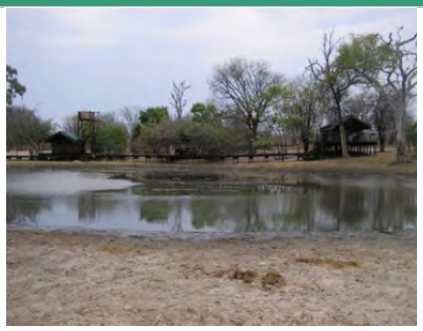
Bottle Pan Camp

5.2.1 The tourism facilities in the concession area have so far been developed exclusively to meet the needs of safari hunters and were not designed for non-consumptive tourism. This includes one functional semi-permanent safari hunting camp (known as Bottle Pan Camp). While Figure 5.1 portrays the location of the Camp within the concession area, the section below is an attempt to provide its detailed profile in terms of accommodation type, number of tents/rooms, number of beds, market level, energy use, water supply and waste management, amongst others.

Bottle Pan Camp Background Info	
Type of Accommodation:	**Semi-Permanet Tented Camp**
Number of Tents:	3 twin-bedded for hunting clients 1 single bed manager's tent
Number of Beds:	**7** beds

Bottle Pan Camp is built from semi-permanent materials which include tents, poles and thatching grass.

The Camp offers luxurious, twin-bedded, East African style tents, built on elevated wooden decks under canopy of indigenous trees. The raised decks offer superb views over the Bottle Pan in front of the camp. Each tent has en-suite facilities with hot and cold running water. Walking trails connecting each tent are also elevated.



Safari Tents around Bottle Pan

Accessibility:	The Camp is accessible by air through a private licensed airstrip. Road access is possible by 4WD vehicles via sandy access track(s) connected to the north-east/south-west cut line.		
Activities on Offer:	Tourism activities are currently focused on seasonal and an exclusive trophy-hunting. Hunting safaris are conducted in a professional manner. Emphasis is put on exclusivity, providing a high quality experience and client satisfaction, rather than a high turnover of clients.		
Market Level:	**Up-market level**		
Market Mix:	Almost all visitors are international predominantly from the North America. Regional visitors contribute an insignificant number of tourists to the Camp.		
Peak Season:	April to September	Average length of stay:	14 (21) nights

Dining room, bar and lounge

The Dining room is thatched and has concrete floors. It is also situated around the Bottle Pan which is continuously pumped with borehole water. As such it offers tourists an opportunity to watch wildlife watering at the Pan while enjoying their meal and leisure time.

Dining Area at Bottle Pan Safaris

Staff Accommodations

There is a total of 12 staff houses made from corrugated iron sheets at Bottle Pan. The twelve (12) staff houses have a total of 22–25 beds depending on the number of people employed and the season. That is, during the hunting season, the number of people staying at staff housing increases due to temporary employment.

Illustration of water that is pumped into the Pan at the Camp during dry season

The Camp's Kitchen, Store Room and Workshop Area

The Camp's Kitchen is brick and mortar and roofed with iron sheets. Kitchen floors are made from concrete slab.

Behind the kitchen is a storeroom, constituted from defunct container generally used to carry goods by trucks.

Mechanic workshop area is also concreted to allow cleanup of possible oil and fuel spills.

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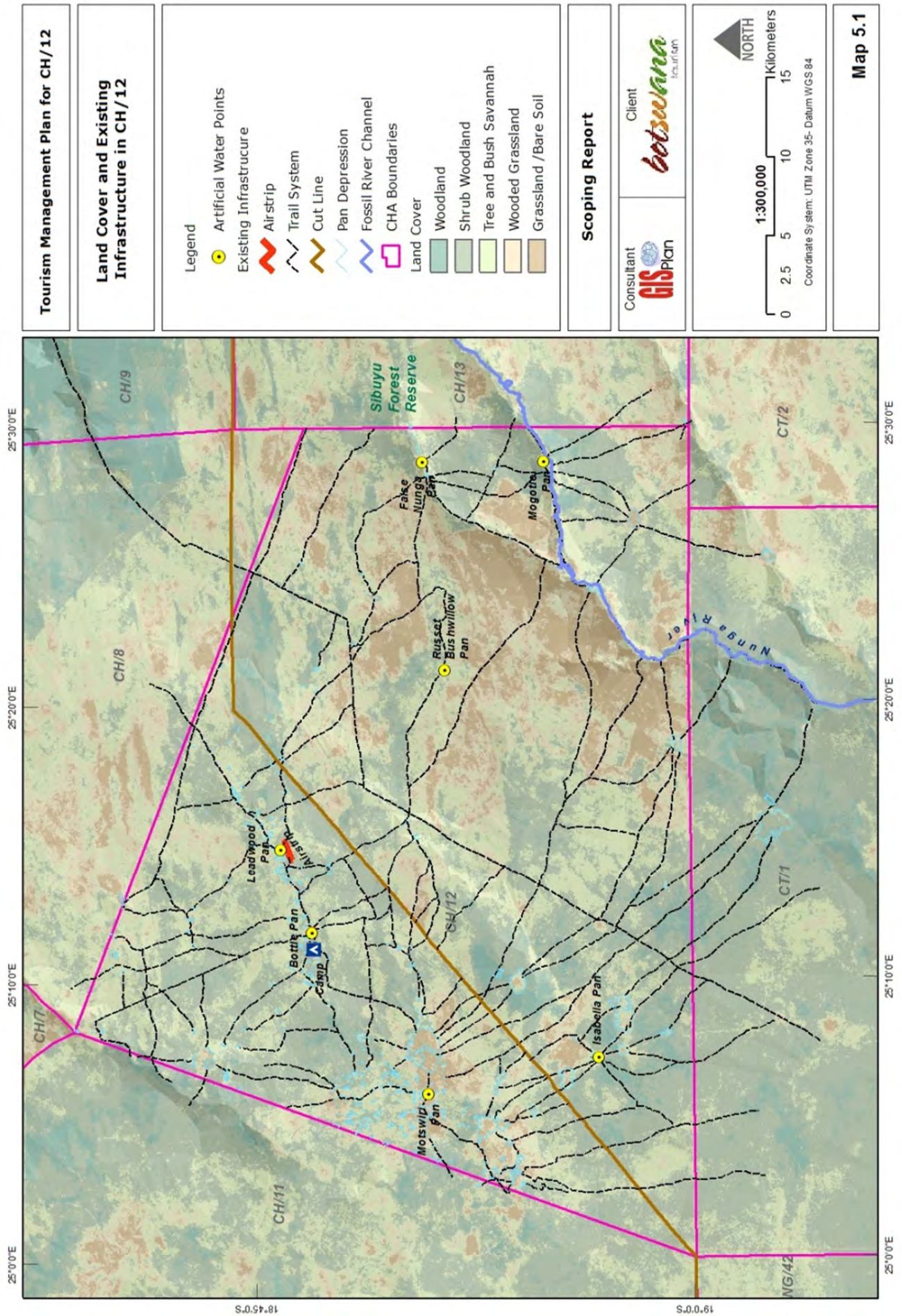
Number of Employees:	The only source of employment in CH/12 is that provided by Bottle Pan Safaris. The number of people employed by the Camp is relatively small when compared to those employed in photographic tourism camps and lodges. The Camp's Management indicated that the camp employs 12 permanent staff only, though this number can rise to 25 people or even 45 people during the "6 months hunting seasons" (when seasonal staff members are employed).
Bottle Pan Camp Infrastructure	
Energy Sources:	Propane gas power is used for cooking in the kitchens, heating water for staff and clients ablutions. An emergency power supply in the event of a loss of power from the 12-volt batteries is available at Bottle Pan Camp Diesel generators are used to run freezers and fridges. It is also used for the charging of backup batteries (12 volts) for camp lighting.
Water Supply:	The water supply for the Camp consists of bottled drinking water, as well as water pumped from the borehole and filtered for safe use.
Solid Waste:	All solid and organic waste is separated, packaged and removed from site to the Kasane landfill.
Liquid Waste Disposal:	The Camp uses the soak-away septic tank system for waste water management.

Bottle Pan – Issues/Challenges

1. There will be requirement to decommission the present camp site and commission a new semi-permanent camp that would elevate standards of the facility in meeting luxury photographic tourism norms
2. The prospective concessionaire shall be required to undertake all technological and other improvements in order to minimize (if not eliminate) the existing environmental concerns
3. Given the "ever growing" demand to reduce carbon emissions (even by this, small-scale facility), there will be a need to replace the existing diesel- generator-based power supply with solar solution.
4. Regardless of high level of facility maintenance, technological improvements will also be required to minimize (if not eliminate) sanitation concerns.


Tourism Management Plan for CH/12
Land Cover and Existing Infrastructure in CH/12
Legend
Artificial Water Points
Existing Infrastrucure
Airstrip
Trail System
Cut Line
Pan Depression
Fossil River Channel
CHA Boundaries
Land Cover
Woodland
Shrub Woodland
Tree and Bush Savannah
Wooded Grassland
Grassland /Bare Soil
Scoping Report
Consultant
GISPlan
Client
Botswana Tourism
NORTH
1:300,000
Kilometers
0 2.5 5 10 15
Coordinate System: UTM Zone 35- Datum WGS 84
Map 5.1
CH/7
CH/8
CH/9
CH/11
CH/12
CH/13
CT/1
CT/2
NG/42
Sibuyu Forest Reserve
Nunga River
Leadwood Pan
Bottle Pan
Motswiri Pan
Fake Nunga Pan
Mogothe Pan
Russet Bushwillow Pan
Isabella Pan
25°0'0"E
25°10'0"E
25°20'0"E
25°30'0"E
18°45'0"S
19°0'0"S

5.3 AIRSTRIP

5.3.1 CH/12 has one airstrip facility located 8 km from Bottle Pan Camp (see Figure 5.1). It is licensed by CAAB for operation of non-scheduled flights by light aircrafts of maximum authorized weight not exceeding 5700 kg. The airstrip currently meets specifications for private licensed airstrips formulated in the "Procedures for the Licensing of Private Aerodromes" issued by CAAB. In this regard, the runway is made of material capable of withstanding 5700 kg mass of an aircraft. The stopway also has the same strength as the runway so as to prevent structural damage to an aircraft running over it. The strips on either side of the runway are graded to required slopes. The airstrip is formally owned by Bottle Pan Safaris. With regard to license, it is issued by CAAB, usually for a period of one year and it is renewable

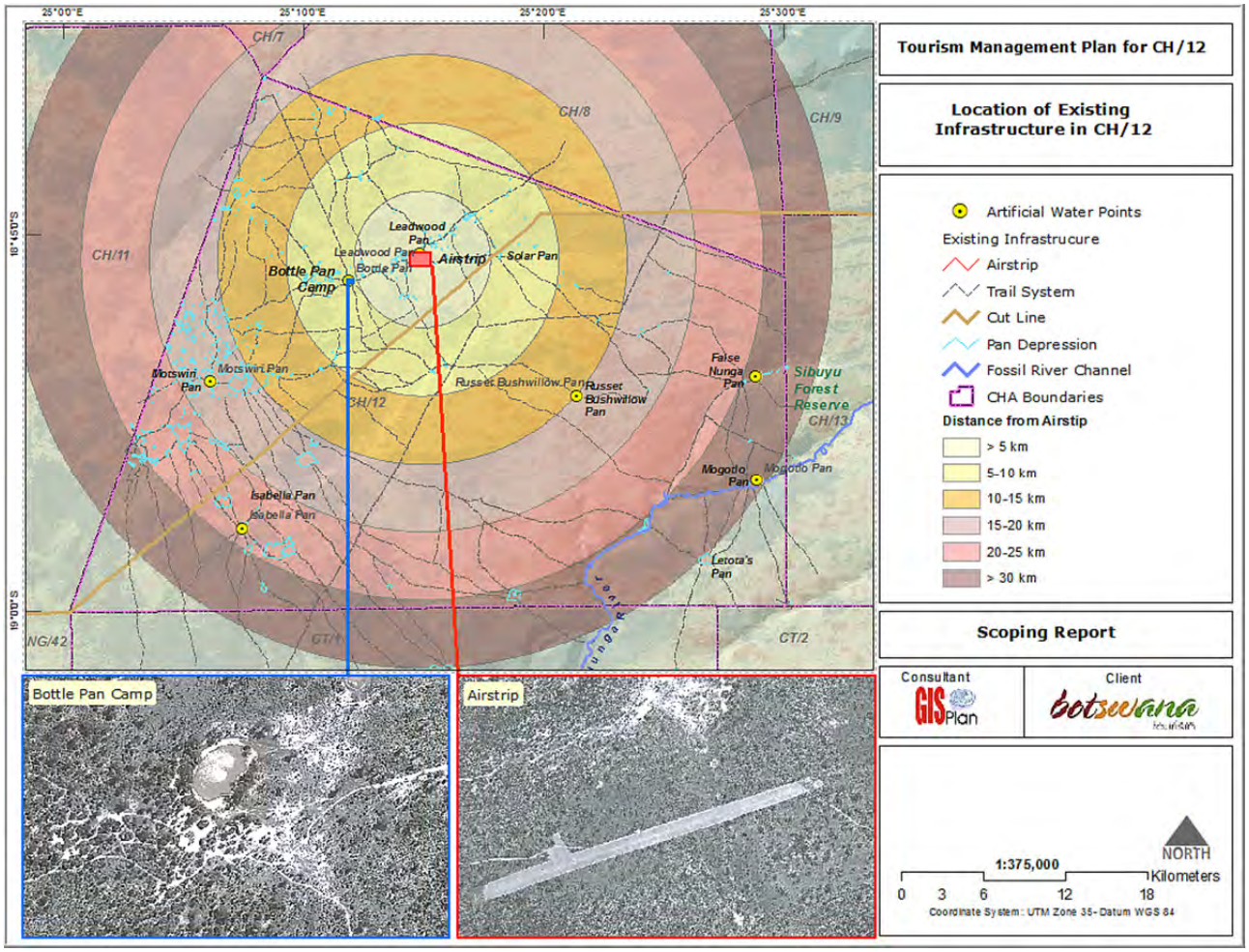


Figure 5.1: Location of Bottle Pan Camp and Airstrip within CH/12

5.4 FIREBREAKS

5.4.1 CH/12 has been cut across by one major firebreak (cut line). As shown in Map 5.1, it passes through the concession and interconnects the area with NG/42 and Nata-Kazungula (A33) primary national road through CH/8. During the field survey it was observed that the firebreak is properly maintained.

5.5 ROADS AND ROAD ACCESS

5.5.1 Access to CH/12 is only possible along the aforementioned firebreak (cut) line traversing the concession. As already indicated, the cut line is connected to the national primary road (A33), as well as to the existing trail system within the concession (see Map 5.1). The cut line in general and the CH/12's trail system in particular are loose sand tracks requiring 4WD vehicles all year round. During the wet season these trails may become quite challenging to negotiate. The CH/12's trail system is predominantly slow going, winding and sandy and usually follows elephant paths. Tracks have not been graded and are occasionally opened up by removing trees or branches that were broken by elephants while traversing through the area. Furthermore, to avoid compaction and restriction of water absorbance with an increased run-off and erosion, none of the roads and trails is hardened. No signage occurs in the concession area at present.

Plate 5.1: Existing Road (Trail) System Quality in CH/12

5.6 ENVIRONMENTAL STATUS OF CH/12

5.6.1 CH/12 is generally a clean concession area. This is partly because the concession is located in an area which is not easily accessed by local communities. In addition, there is only one camp (Bottle Pan) which is generally a hunting camp that operates for about six (6) months a year. However, minor environmental concerns were observed in the concession area during fieldwork. These include the following:

(i) ***Liquid Waste disposal & Soak-away septic tank system*** – Bottle Pan Camp use the soak-away septic tank system for wastewater management. An interview with the Manager of the concession indicated that the groundwater table might be lower as the camp is situated at a Pan. In this regard, the continued use of this system might have effects on ground water (especially during rainy seasons) when it rises to even 0.5 meters beneath the surface, causing septic tank overflow. The continued use of soak-away septic tanks by this camp has the potential for groundwater contamination from faecal bacteria and nitrates. The problem is made worse by the fact that Bottle Pan Camp appears to be situated in an environment prone to water logging. A change of the waste management system for the concession area is therefore necessary. Proper waste management standards will need to be recognized and applied to all the sectors of waste (i.e. clinical, solid and liquid).

(ii) ***Petroleum products*** – Petroleum products like used oil from the diesel engines used to pump water is transported to Kasane Landfill through hired companies. In this regard, much of the liquid waste and hazardous materials are disposed safely in Kasane Landfill. All fuel storage facilities in CH/12 have bund walls to ensure that spills and leaks are contained. Although storage facilities have plastic ground sheets covered with sand so that spills can be

collected and shipped out if necessary, there will be a need for upgrading the all facilities following guidelines provided for in Botswana's Waste Management Strategy.

(iii) ***Clinical waste Disposal*** – Clinical waste can be harmful to both human beings and wildlife. While this is the case there are no measures put in place by the current concessionaire on the safe disposal of clinical waste from CH/12. As a result, measures would need to be taken to ensure proper clinical waste disposal which includes the collection and proper storage of waste before being disposed of the concession area, e.g. to Kasane Landfill.

(iv) ***Solid waste*** - All waste and rubbish in CH/12 especially at Bottle Pan Camp is sorted (i.e. glass, plastic and tin are separated) and then transported and disposed of in Kasane. Generally, CH/12 appears to be a very clean concession area when compared with some of the concession areas especially those which have human settlements and campsites.

(v) ***Litter*** **-** There was no refuse litter observed during the site visit and field survey throughout CH/12 and in particular at Bottle Pan Camp. In this regard, it can be concluded that CH/12 is a clean concession area. While this is the case, littering was reported in CH/12 in the last two years mainly because of the grass cutters who invaded and camped in the concession area to harvest thatching grass.

(vi) ***Energy Use*** – Bottle Pan currently uses both solar energy, gas cylinder and diesel generated energy. The three (3) tourist tents and the manager's camp use solar energy for lighting. Propane gas power is used for cooking in the kitchens, heating water for staff and clients ablutions. An emergency power supply in the event of a loss of power from the 12-volt batteries is available at Bottle Pan Camp. Diesel generators are used to run freezers and fridges. It is also used for the charging of backup batteries (12 volts) for camp lighting. The camp also uses solar energy for the accommodation tents for visitors all the time. The use of solar energy may need to be considered by Bottle Pan Camp since it is more eco-friendly than diesel power generation.

(vii) ***4WD Tracks*** – Access tracks from the country's main road network to CH/12 are generally not many as is the case with other concession areas. As a result, the primary access tracks in the concession are manageable and do not affect the aesthetic value of an area. However, analysing the recent high-resolution imagery available for the concession, a number of 4WD trails and pathways were identified in CH/12. They are mostly created for trophy hunting purposes and follow elephant paths.

5.7 EXISTING MANAGEMENT FRAMEWORKS AND STRUCTURES

5.7.1 CH/12 is a concession area with just one tourism operator (Bottle Pan Safaris) operating in the concession. It was noted during stakeholders' consultation that CH/12 does not have any "Concession Management Committee" which regularly meets to discuss issues, mitigate or resolve conflicts.

5.7.2 An overview of the existing situation also revealed that natural resource use, planning and management, and in that regard the enforcement of legislations/policies in CH/12 is, at the central and local government levels, insufficient. There is a lack of means to regularly inspect the area's resource and eco- status, and to make management decisions or enforce existing regulations. This has led to a virtual absence of natural resource and biodiversity monitoring from the government side, in CH/12, and a corresponding lack of input into natural resource and biodiversity management efforts. The situation is, however, greatly rectified by notable efforts of the concessionaire in CH/12, (i.e. Bottle Pan Safaris) in conducting regular yearly ecological monitoring and evaluation programmes and collecting and exchanging information related to vegetation, wildlife and the general biodiversity with the relevant government institutions and other stakeholders.

Summary of Identified Issues and Challenges

CHAPTER 6: SUMMARY OF IDENTIFIED ISSUES AND CHALLENGES

6.1 INTRODUCTION

6.1.1 Field Surveys, consultations with relevant stakeholders and analysis of collected baseline information/data on existing situations in CH/12 have all enabled the identification of prevailing issues, problems and challenges in the concession area. These, to a large extent, will inform the guidelines, regulations and strategies aimed at improving operations and efficient functioning of CH/12, in a manner that clearly spells out management structures, obligations and responsibilities. The identified issues already captured in greater details in the preceding chapters are summarised and presented in the sections that follow.

6.2 MANAGEMENT ISSUES

6.2.1 An appraisal of the current status of CH/12 revealed that the concession area does not have any "Concession Management Committee" which regularly meets to discuss issues and mitigate or resolve conflicts.

6.2.2 It is further noted that the management of CH/12 is multi-sectoral and involves a multiplicity of stakeholder departments which have management and regulatory responsibilities over the area. The multiplicity of institutions involved creates huge challenges for effective planning, monitoring and plan implementation in the concession area. Lack of strong mechanisms for the coordination of their different responsibilities and activities is the main issue.

6.2.3 It is furthermore noted that natural resource use, planning and management, and in that regard the enforcement of legislations/policies in CH/12 is, at the central and local government level, weak. There is a lack of means to regularly inspect the area's natural resources, and to make management decisions or enforce existing regulations. The situation is however, greatly rectified by notable efforts of the current concessionaire in CH/12 in conducting regular yearly vegetation monitoring and evaluation activities.

6.3 BIOPHYSICAL ENVIRONMENT AND STATUS OF BIODIVERSITY

6.3.1 It was observed that soils in the *C. Mopane* (Mophane) and *Acacia* (Mogotlho/Mooka) plant communities in the western and north-western part of CH/12 have a higher clay content and higher nutritional status. Elephant and other large herbivores concentrate in these highly palatable vegetation communities, where surface water is available and directly influence the vegetation structure of these communities. .

6.3.2 Areas within the C*. mopane and Acacia spp.* plant communities, especially near the surface water points and pans, appear over-utilised and the soils compacted through trampling. This has resulted in incidences of the 'piosphere effect'. Accordingly, the current spatial dynamic of grazing pressure should be fully recognized as a growing concern that should be carefully monitored.

6.3.3 There is evidence that the *C.mopane* and *Acacia* plant communities in CH/12 are also changing in vegetation structure, converting from open woodlands, to high shrubs, and to a low shrubby appearance. This especially relates to zones around pans whose water levels are kept almost constant through groundwater pumping. Specific preferred tree species are targeted by large herbivores and the visual effect is clearly seen on A*. erioloba* (*Mogotlho), A luederitzii (Mooka), and*

C. mopane (Mophane) trees. In addition to this, incidences of degradation of vegetation and increase of bare land patches especially around pans, is a subject of concern.

6.3.4 CH/12 is among the areas endowed with a diversity of vegetation resources which include thatching grass, firewood, and wood-derived construction material. From a socio-economic stand point, presently thatching grass is the most important vegetation resource found in CH/12. Local communities from Pandamatenga and people from other parts of Botswana settle temporarily to cut grass in CH/12. Problems associated with grass cutting which were observed in the past include littering, poaching, and stealing of diesel from borehole pumps. Currently there are no strong regulatory mechanisms except for control of the grass cutting season, which usually starts from July and end in October each year. It is also suspected that grass cutters set fires at the end of the cutting season to remove moribund plant material and enhance the grass crop of the next season. Although such suspicions have not been confirmed, it is highly likely that grass cutters do use fire in that manner. Off-road driving and the development of numerous tracks is also becoming a subject of concern.

6.3.5 With regard to rangeland conditions in CH/12, it was observed that the grass species composition, its dynamics and change over time and space in the concession area is a result of a synergy between rainfall variability, herbivory and fire. The significance of rainfall variability has been identified in terms of occurrence of long-term cycles of wet and dry sequences. The specific sequence of dry or wet sequences seems to be the major factor determining the changes in CH/12's grass species composition.

6.3.6 Veld fire has also been noted as an important factor in influencing the ecology of CH/12's dry land savannah ecosystem and its rangeland conditions. It is observed that fire opens up the woody component and burns old moribund plant material to stimulate new growth that attracts animals to CH/12, especially the less palatable sandy areas. This, in turn has an ability to influence animal distribution in the concession and consequently lessen the herbivore pressure on the palatable vegetation of the pan and fossil river system within the concession area. This would likely relieve grazing pressure on preferred vegetation and provide them with the much needed "rest or recovery" period.

6.3.7 It was furthermore noted, that fire is a commonly used management tool by grass cutters. Under the present conditions of open access, large areas of CH/12 and its surroundings burn almost every year, despite a total ban on the practice. No responsibility is taken for final outcomes, and attempts to control them are not yet successful. Besides its significance in determining vegetation structural dynamics, it was also noted that these (human-induced) veld fires (especially ones that burn under hotter ambient conditions) have negative consequences on biodiversity components such as slow moving tortoises and ground nesting birds. Such fires also have the potential to kill trees and shrubs. Accordingly, more control over veld fires and their frequency in CH/12 is considered as one of the most important challenges. Frequent and usually high magnitude veld fires are bound to decrease the prospect of CH/12 as a key photographic tourism destination. However, a strict "No Fire" policy for the CH/12 would also be ultimately unsustainable and likely to result in continued ecosystem damage and loss of tourism and resource use potential. In this regard there is a need to institute and implement an early winter rotational burning programme that would reduce fuel loads whilst avoiding irreversible damage and stimulating species diversity.

6.3.8 A further challenge the management of CH/12 will face, especially in relation to the area's rangeland carrying capacity relates to estimates of the likely consequences of climate changes. According to various climatic models it appears that these eco-zones are likely to experience both increasing aridity and frequency of extreme precipitation events. Some models go further to show

that one of the possible results of global warming could be a more than 15 % decrease in rainfall, along with 5-10 % increase in rates of evapotranspiration. This, if and when it happens, would cause considerable changes in vegetation and biomass distribution with implications for the management of CH/12. It is unlikely that any of these climate change assumptions would affect the CH/12 within the 15-years management plan's timeframe. In this regard, there is a high level of confidence that the ecosystem throughout the concession area will continue to operate within known cyclical and seasonal fluctuations.

6.3.9 With regard to wildlife, the lack of permanent surface water in CH/12 was one of the most important factors that have influenced productivity in the system in terms of wildlife abundance and distribution. Within the concession area open water is, under natural conditions, only found in pans or depressions, as well as in the Nunga "fossil river" after rainfall events.

6.3.10 The development of artificial water points, by means of targeting seven existing natural pans throughout CH/12 into which water is pumped for wildlife, has also had a major impact by encouraging the habituation of species that would under natural conditions migrate back to traditional dry season home ranges closer to the Okavango, Linyanti, Chobe and Hwange systems. It was noted that existing natural pans are clearly beneficial in terms of providing focal points for tourists, contributing to the attractiveness of the concession area, and thereby enhancing its ecotourism and economic viability.

6.3.11 It was also noted that the provision of permanent water throughout CH/12 resulted in dwindling effect of surface water as one of the most critical limiting factors that determine the functioning of, and interaction between plant and animals in the concession area. Unquestionably, surface water has significant positive effects on wildlife abundance and distribution in CH/12. Large game species such as buffalo and elephant move into CH/12 and become resident, especially in zones where surface water is found.

6.3.12 On the other hand, the provision of permanent water throughout CH/12 has also led to concerns that it may upset the balance and functioning of the ecosystem, probably negatively in the long term if these influences are not acknowledged, monitored, and adaptively managed. The destruction of woody vegetation around waterholes by large herbivores, especially elephants, might cause problems for the conservation of other less mobile herbivores that depend upon vegetation close to permanent water sources.

6.3.13 Observations have also been made that animal numbers in CH/12 have increased over the years, most likely as a result of the availability of permanent water. At present, CH/12 supports a diversity of wildlife resources, with elephant and buffalo as the most notable mammalian species impacting on the vegetation.

6.3.14 CH/12 does not exist in isolation. It is a part of larger Northern Botswana Wildlife System suggesting that the concession area benefits from the natural movement of animals. It is, in this regard observed that wildlife might need some time to habituate to non-consumptive tourism due to the transition from previous hunting activities that have caused enhanced levels of vigilance and flight away from humans.

6.3.15 The sheer size of CH/12, together with the vast extent of neighboring concession areas, Forest Reserves and National Parks (Chobe and Hwange) is one of the greatest advantages that make this concession unique. The adjoining and adjacent areas form an ecological unit and are inter-dependent on each other in terms of ecosystem component and services. They should support each other principally in terms of providing wildlife in the region with the ability to move in and out of the system to take advantage of a bountiful food source during the wet season and leave during

drought, when conditions render survival almost impossible. Changes in yearly migrations or movement patterns of animals do occur, underscoring the complexity of the CH/12 environment and the need for integration and monitoring. Therefore, maintaining landscape permeability and connectivity to other nearby systems, is also noted as one of the most important challenges.

6.3.16 Appraisal of the existing situation revealed that buffalo, giraffe, and elephant are present in reasonable numbers in the concession area throughout the year. Rare and endangered species such as sable antelope, roan antelope and wild dogs are regularly sighted, especially in the eastern and southern part of the concession area, making photographic game driving experiences in the concession area viable. The increase in prey species numbers also positively enhanced predator numbers. Lion and leopard sightings were recorded and specific prides and individuals could be identified

6.3.17 The veld condition is in an acceptable state, with enough preferred forage species and heights available in the area, while the woody density at critical heights is open enough for the habitat-sensitive species to occur in CH/12.

6.3.18 Generally, the appraisal of the existing situation revealed that biodiversity status in CH/12 remains in relatively good conditions and, except for human-induced fires, there are few other serious threats to the biodiversity of CH/12 that require urgent reactions.

6.3.19 Conflicts between grass cutters and tourism activities remain a major potential threat although no major conflict has been reported yet, and the situation is still under control.

6.3.20 Pans are a very important part of CH/12's environment. In general, more knowledge is required regarding the structure and functioning of pans, the relationship between rainfall and water holding capacity, as well as the role of animals such as warthogs and elephants in pan formation and maintenance.

6.3.21 Poaching, especially cross-border is reported to be relatively low in CH/12. Structured conversations with the Concession Management revealed that the current concessionaire has cordial relations with law enforcement institutions such as the Botswana Defense Force and the Department of Wildlife and National Parks who have so far been quick to respond when incidents of poaching were reported. Although the exact frequency of incidents of illegal hunting is not known, some observations have indicated that any illegal off-take of wildlife from CH/12 and its surrounding could reverse the increase in wildlife populations within the concession area, thus diminishing its potential for non-consumptive ecotourism development. Accordingly, illegal hunting which is prevalent in the Chobe District and elsewhere may also be regarded as a major threat to the wildlife resources and their contribution to the tourism product of CH/12..

6.4 LAND USES, TOURISM ACTIVITIES AND ENVIRONMENTAL ISSUES AND CONCERNS

6.4.1 Identified issues, problems and challenges relating to land uses and tourism activities in CH/12 are summarised as follows:

(i) Historically, CH/12 was (and still is) a successful and profitable safari hunting concession area. Accordingly, a shift from safari hunting to photographic tourism makes the concession to face competition from already developed photographic tourism sites. Therefore, a key challenge especially over the first few years of the shift to non-consumptive tourism relates to provision of a sufficient range of quality, viable products with an innovative and marketable theme. Specifically, there is a danger of flooding the market with a range of quality but poorly conceived nature and culture-based products that offer similar

experiences and which collectively may exceed market demand. In this regards, it is believed that the commercial viability of CH/12's non-consumptive ecotourism programme will be enhanced if its products complement (integrate) well with other existing and planned tourism initiatives in the region.

(ii) Appraisal of the current situation revealed that tourism use within CH/12 is considered to be below its carrying capacity. Specifically, the current tourism use of CH/12 even during the peak season does not appear to have a widespread impact on its environment and ecological integrity.

6.4.2 The issues and concerns on the environment, relate in summary, to the following:

(i) The only Camp in CH/12 (Bottle Pan) uses soak away septic tanks for sewerage disposal. This could have implications for underground water contamination. Field observations revealed that the problem is at present not serious but points to the necessity to undertake facilities upgrading and other efforts aimed at minimizing sanitation concerns.

(ii) The Camp, as well as the borehole pumps, uses generators which are not environmentally friendly, in terms of noise pollution, as well as oil and diesel spillages. The current Concession Manager indicated that they are on course to replacing the diesel pumps with solar powered ones commencing end of February 2013.

6.4.3 Environmental concerns in CH/12 are at present moderated by the low level of visitors, together with the high level of site maintenance that the current concessionaire provides. The presence of on-site management has also minimised the potential for sanitation concerns. However future improvements will certainly be required. With regard to this, the prospective concessionaire will be required:

(i) To continue focusing on upper market segments and thus refurbish existing accommodation facility (Bottle Pan) in order to elevate the quality of services required for upper market tourism;

(ii) To recognize and apply waste management standards that are stipulated in the Tourism Management Plan for all categories of waste (i.e. clinical, solid and liquid) waste;

(iii) To replace the existing diesel generator-based power supply (especially for borehole pumps) with the more environmentally-friendly solar powered supply given the need to reduce noise pollution around pans, as well as the "ever growing" demand to reduce carbon emissions (even by small-scale facilities)

6.5 SWOT ANALYSIS FOR CH/12

6.5.1 The identified issues and challenges already captured in greater detail in the preceding chapters are summarised and presented hereunder in the form of a SWOT (Strengths, Weaknesses, Opportunities, and Threats) analysis for the CH/12 concession area.

6.5.2 The SWOT appraisal below presents an overall picture of the strengths, weaknesses, opportunities and threats that characterise CH/12.

Strengths

(i) Low human/community foot print, thus enhancing the pristine and wilderness character of the concession area

(ii) There are no land use conflicts, as there is no competition for land from activities such as livestock and arable farming (With farming developments in the Pandamatenga area, conflicts might arise in the future)

(iii) Arid environments are best suited for wildlife based economies

(iv) Migratory systems have a higher carrying capacity than continuous grazing systems

(v) There is high likelihood of sighting some of the charismatic species such as the "Big Five";

(vi) Potential of all natural pan and artificial water sites in the area to be promoted as wildlife viewing and scenic vistas

(vii) Ability to reintroduce species once found in the ecosystems concerned and link protected areas via the KAZA TFCA corridor;

(viii) High level of site maintenance provided by the concessioner, considerably minimise the potential for the sanitation and other environmental concerns

(ix) Key infrastructure services requiring considerable investments (access road & airstrip) already in place

(x) The proposed tourism products found to be feasible in CH/12 can easily be integrated in the diverse range of attractions in Botswana (diversification of the tourism product)

(xi) Well thought out policies and plans that guide and support tourism in Botswana with particular reference to the Chobe region

(xii) Stable political and economic environment in Botswana;

(xiii) Considerable potential for returns on investments in the tourism industry given the proximity to existing national parks

Weaknesses

(i) The lack of permanent surface water throughout the year;

(ii) The attractiveness of the area in terms of game viewing is directly related to the availability of water which needs to be pumped and subsequent costs influence the financial feasibility of a non-consumptive tourism venture.

(iii) Seasonal migration of many game species may influence the annual viability and success of photographic tourism

(iv) Changes in seasonal migration patterns of game according to rainfall variability in the area

(v) Wildlife might need some time to become habituated to non-consumptive tourism due to a history of previous hunting activities in CH/12

(vi) The vegetation is in most of CH/12's areas fairly dense, and visibility from the photographic tourism viewpoint, is not optimal.

(vii) Relevant Government departments have limited capacity to undertake regular monitoring of the spatio-temporal variation of ecological and environmental parameters in CH/12;

(viii) Limited involvement of locals in the tourism industry

Opportunities

(i) Wildlife-based outdoor recreational activities are likely to increase

(ii) Wilderness areas and the biodiversity they contain are likely to increase in value

(iii) Largely intact dry-land habitats offer opportunities for walking safaris during which tourists experience African wilderness;

(iv) If CH/12 continues to be well managed, the opportunity exists for keeping and/or increasing resident wildlife populations;

(v) Existing cut-lines, as well as wildlife/human trails through the concession offer opportunity to develop nature trail system with relatively minimal vegetation disturbance

(vi)	The area is part of the declared Kavango-Zambezi Transfrontier Conservation Area.
(vii)	There is potential through the KAZA-TFCA development for stronger linkages between western Hwange National Park and the eastern Botswana concession areas, in terms of both wildlife and visitor management
(viii)	Eco- tourism practices are gaining popularity in global tourism.
(ix)	Potential for employment opportunities to increase with unlocking the photographic tourism potential of the concession area.
(x)	CH/12 area has great potential to attract both domestic and international tourists and investors due to its unique environment which can serve as tourist attraction
(xi)	Opportunities for involvement of more locals in the tourism industry
(xii)	Good governance including regional (e.g. KAZA TFCA) and national governance initiatives in place (KAZA)
(xiii)	Increased income generation for government from fees and tax as tourism activities expand to photographic tourism
(xiv)	Upgrading the concession area for an up-market clientele is likely to improve environmental management standards and customer services
	Threats
(i)	Shifting from safari hunting to photographic tourism could lead to greater levels of poaching risks and uncontrolled natural resource utilization by local communities;
(ii)	The area is subject to frequent human-induced and uncontrolled fires;
(iii)	Unwanted tracks in a tourism destination area affecting the aesthetic value of an area;
(iv)	There is a lack; monitoring the area's biodiversity and natural resource base, which compromises and threatens informed and effective decision- making or enforcement of the existing regulations;
(v)	There may be attempts to boost profits, which may lead to environmental mismanagement in the area Potential for negative human-wildlife interactions with increased use
(vi)	Economic down turn affects investment capability of private sector
(vii)	Recurrent droughts
(viii)	Climate Change
(ix)	Diseases (HIV/AIDS) especially among workers can negatively affect productivity.

6.5.3 From the foregoing SWOT appraisal it could be deduced that the strengths and opportunities of the ecotourism industry in CH/12 outweigh the weaknesses and threats to its continued development. The Tourism Management Plan for CH/12 therefore capitalises on the strengths and opportunities of the concession area when prescribing strategies and management guidelines, such that they do not erode the strengths or diminish the opportunities. On the other hand, the Plan will also come up with guidelines and strategies aimed at addressing areas of weaknesses and threats, in such a manner that areas of weaknesses could be strengthened where possible, and mitigation measures prescribed for dealing with the threats. In this sense, the above SWOT appraisal serves as a useful tool in the development of the Tourism Management Plan.

7

Vision, Strategic Goals and Objectives for CH/12

CHAPTER 7: VISION, STRATEGIC GOALS AND OBJECTIVES FOR CH/12

7.1 INTRODUCTION

7.1.1 The preceding chapters of this Tourism Management Plan focused on collecting background information for the situational analysis of elements and sectors that presently exist in the concession area. These include previous land use planning and resource management initiatives, other tourism and recreation studies and inventories that were carried out. Existing tourism products were reviewed and potential tourism opportunities identified. Members of the Project Team consulted local tourism operators and other stakeholders to gather data for analysis and synthesis into the Report.

7.1.2 Outcomes of the various analyses and field surveys have enabled the consolidation of strategic directions presented in this chapter. Their intent is to provide an information base that can be used to understand what the tourism resource is in CH/12 and how best to support sustainable tourism development and identify priority opportunities for the concession area.

7.1.3 There is no doubt that ecotourism is a leading economic consideration in CH/12 and without the wilderness land base, this industry would not continue to thrive. Consequently, strategic directions suggested in the following sections of the Report are aimed at linking the ecotourism products and opportunities in CH/12, to its natural resources. With this link made, the importance of managing the resources for sustainable ecotourism becomes the focus, mindful of the prevailing resource use issues and potential conflicts that might arise between and among resource users.

7.2 CH/12 VISION, STRATEGIC GOALS AND OBJECTIVES

CH/12's Tourism Development Vision

7.2.1 The Government recognizes the fact that Botswana is an international tourism destination and as such, any tourism development vision for CH/12 should be premised on Government's policy direction of promoting and achieving sustainable tourism in the country. In the case of CH/12, sustainable tourism should therefore, meet two primary requirements: (a) the demands of the growing number of local and international tourists; and (b) safeguarding the biodiversity, wilderness character and ecological functionality of the area.

7.2.2 Given that CH/12 is located in a naturally unspoiled and sensitive environment linking adjoining Wildlife management Areas, National Parks and Game reserves, tourism development in the area should therefore be designed in such a manner that ecosystem connectivity and wilderness appeal in the concession are not compromised.

7.2.3 From consultations with stakeholders it emerged that ecotourism development in CH/12 in the years ahead, should follow a path that:

(i) Protects, maintains and improves the biodiversity integrity of the concession area;

(ii) Ensures that the ecological systems, unspoiled nature and wilderness character of the area are not negatively impacted by tourism activities, and that the tourism carrying capacities of the environment are not exceeded;

(iii) Preserve the landscape's connectivity of CH/12 through wildlife movement corridors as one of the key elements needed for the wider area biodiversity conservation framework.

(iv) Provides for appropriate management structures that will ensure efficient running of activities within the concession area;

The Vision

CH/12 will become a regionally prominent destination for ecotourism in Northern Botswana and serve as a role model for sustainable ecotourism development and professional management and conservation of biodiversity.

Management Goals

7.2.4 The overarching management goal for Concession Area CH/12 is "***to unlock the ecotourism potential of the area in a sustainable manner recognizing that the largely unspoilt natural environment and wilderness is a major draw card for tourists***". Other management goals and specific objectives should therefore be achieved without prejudice to the primary and overarching management goal as stated above.

7.2.5 The following specific management goals are formulated for CH/12:

(i) Transforming the current hunting use of CH/12's and its environmental resources into 'photographic' tourism assets;

(ii) Proposing ecotourism products found to be feasible and complementary with products of neighbouring WMA and PAs;

(iii) Promoting the long term maintenance and preservation of the biodiversity and where necessary ensuring its rehabilitation and restoration;

(iv) Ensuring that CH/12 is managed so that it can continue to function and evolve with minimum human intervention and where the integrity of landscapes and scenery is protected;

(v) Adopting and implementing a "green" (eco-tourism) strategy;

(vi) Defining the nature of the visitors' experience foreseeable in CH/12, in general and for various destinations in particular;

(vii) Creating a conducive investment and operational environment attractive to ecotourism companies;

(viii) Ensuring the provision, installation, development and maintenance of adequate and unobtrusive infrastructure, facilities and equipment conductive to conservation

(ix) Establishing cooperative, collaborative and mutually beneficial relationships amongst all stakeholders, in order to ensure the long term sustainability and viability of CH/12

(x) Creating an environment in which the impact of decisions on the biodiversity in the concession, as well as its natural resources can be measured, and decision-makers held accountable.

7.3 SCENIC VALUES AND VISUAL RESOURCES

7.3.1 Given the nature of CH/12, scenic values and visual resources, as components of the wilderness experience, are considered to be the key to both present and future ecotourism use opportunities in the concession area. With regard to this, the following scenic values and resources in the concession are considered note-worthy:

Natural (Unspoiled) Character of CH/12

7.3.2 Evidence suggests that many people have a strong relationship with 'the wilderness' and specifically value the wilderness experience as an opportunity to escape from urbanity. Accordingly, the current "unspoiled surroundings", as well as the wilderness character of CH/12 devoid of extensive human alteration are considered as one of the area's key values in providing opportunities for quality wilderness experience. Any future ecotourism and infrastructure development should therefore maintain and preserve these CH/12 values.

Wildlife resources

7.3.3 The presence of wildlife in CH/12 is integral to the scenic appeal since it is wildlife in their natural habitats that makes the concession area a potential place to visit. Particular attractions are large herbivores like elephants and buffalo as well as predators such as lions, leopards and wild dogs. It is well documented that tourists appreciate vertebrate diversity at large, favoring the charismatic "Big Five", namely elephant, rhino, lion, leopard and buffalo. Given the fact that the majority of these species could be found or are resident in the concession area serves as one of the major draw cards for ecotourism opportunities in CH/12.


Plate 7.1: Elephants and Buffalos Spotted in CH/12 during the Dry Season- October 2012)

7.3.4 Since wildlife is considered to be an integral part of CH/12's scenic resources, the maintenance and preservation of critical habitat for wildlife is of utmost importance. There seems to be widespread agreement that, if the ecological integrity of CH/12 is retained and land uses are managed appropriately, the area has the potential to continue supporting the aforementioned "Big Five" population.

Natural Pans and Artificial Water Points

7.3.5 CH/12 contains landscape resources affording opportunities for scenic vistas in almost all parts of the concession area. These scenic vistas are essentially natural pans that collect water during the rainy season, as well as permanent artificial water points which are maintained by the current concessionaire by means of pumping underground water into the natural pan depressions located throughout the concession area. Several birds and mammal species congregate at these water points during the dry season.

7.3.6 All permanent artificial water points in CH/12 seem to be aesthetically adequate as they mimic natural pan conditions. As such they all have a potential to be promoted for ecotourism development at CH/12 as "wildlife viewing and scenic vistas".

Vegetation/Forest Resources

7.3.7 Similar to other dry woodland areas, CH/12's vegetation, and especially *Acacia erioloba* (Mogotlho) -*Acacia luederitzii* (Mooka) plant communities, can contribute to the tourism product of the concession by providing a good wilderness and solitude experience that can be enjoyed by tourists. *Acacia erioloba* (Mogotlho) is an icon of the Kalahari and Northern Botswana, with great aesthetic appeal. Open savannas with well-spaced trees likely present better game viewing and photographic opportunities than closed woody thickets, or grassy plains.

Cultural /Heritage Tourism Resources

7.3.8 The appraisal of the situation in CH/12 showed no cultural heritage resources identified within the concession. However, CH/12 is likely to benefit from surrounding tourism nodes like Kasane and Kazungula which are diversifying their ecotourism products from wildlife and scenic base to cultural heritage tourism experiences.

7.4 ECOTOURISM DEVELOPMENT STRATEGIES

Ecotourism Potentials

7.4.1 As demonstrated in the Scoping Report and this Plan, CH/12 has quite a history of tourism use, and indeed has wilderness tourism development potential. However, this potential has not been identified in the past mainly because the concession area was designated exclusively for safari hunting. In addition, non-consumptive ecotourism opportunities in CH/12 have not been previously harnessed mainly because of the scarcity of open surface water throughout the year to attract wildlife, and by extension, eco-tourists.

7.4.2 The appraisal CH/12 has however indicated that the concession area is gaining momentum in terms of its non-consumptive ecotourism development potential. In this regard, the Project Team for this Tourism Management Plan, as well as stakeholders that were consulted are of the opinion that opportunities for wilderness recreation experiences and tourism use in CH/12 at this point of time are viable. This is based on the following :

(i) CH/12 covers an area that is larger than 100,000 hectares (148800 ha) and as such it is above the size threshold generally preferred for a quality wilderness experience. However, the dry climate together with a lack of permanent surface water is the crucial limiting factor that determines wildlife abundance and distribution. Therefore, despite the size of CH/12, the need to provide and properly manage artificial water points is essential if wildlife populations are to be maintained throughout the area over the long term.

(ii) CH/12 has developed its wildlife viewing value over the last 15 years from few sightings to relatively good opportunities. This mainly results from the current concessionaire's efforts in providing permanent artificial water points distributed throughout the concession area. It is further believed that wildlife in CH/12 might need some time to habituate to non-consumptive tourism due to the transition from previous hunting activities.

(iii) It is already mentioned in this Report that tourists appreciate vertebrate diversity, while favour sighting of the "Big Five" species. The fact that the majority of these species (especially elephant, buffalo) could be found or are resident in the concession area presents one of the major draw cards for ecotourism opportunities in CH/12.

(iv) The current "unspoiled surroundings", as well as the "wilderness character" of CH/12 creates an opportunity to attract more tourists and investors interested in nature-based tourism. This especially relates to provision of opportunities for solitude, as well as a high quality wilderness experience in a largely unspoilt environment.

(v) Potential of all natural pans and artificial water sites in the concession to be promoted as "wildlife viewing and scenic vistas" is yet another component of the wilderness experience and is vital to future tourism opportunities in CH/12. This also creates an opportunity for diversification of ecotourism products and activities in the area.

(vi) Non-consumptive ecotourism potential in CH/12 may in the long term also be significantly boosted once the KAZA Transfrontier Conservation Area initiative comes to practical fruition. It is, in this regard, expected to establish stronger linkages between western Hwange National Park and the eastern Botswana concession areas (including CH/12), in terms of both wildlife and visitor management.

Opportunities for Eco-Tourism Products in CH/12

7.4.3 The development of a range of viable non-consumptive ecotourism products with a distinctive and marketable theme is without doubt the priority objective of this Tourism Management Plan for CH/12. On the basis of ecotourism potentials summarized in the previous section, CH/12 lends itself logically to the development of ecotourism products that combine guided safaris, bushwalks and wilderness mobile camping excursions and opportunities to experience wilderness scenery, remoteness, and solitude.

7.4.4 At present, wildlife viewing experiences in the form of exclusive, low intensity (4-6 visitors) 4x4 game drives may be opportunistic up to the moment when wildlife in CH/12 acclimatises to non-consumptive tourism due to the transition from previous hunting activities. It is expected that increases in the population sizes of prey species would also positively enhance predator numbers.

7.4.5 With regard to the above, it is the considered view of the Project Team and stakeholders consulted that primarily ecotourism product development in the concession needs to focus on the CH/12's wilderness character and its wildlife viewing and scenic vistas. The existing seven natural pans, acting as permanent artificial water points and distributed throughout the concessions, arouses keen interest on account of their scenic and wildlife viewing values and have the potential to become a key marketing theme for the CH/12's ecotourism programme.

7.4.6 When identifying potential ecotourism products for development in the concession area, it will be desirable to avoid, whenever possible, developing similar types of products that will compete with each other in the same general location of CH/12. Consultations with industry players revealed that preferences among eco-tourists and independent travellers may revolve around 3 to 4 days duration mobile "pack it in, pack it out" wilderness walking safaris which could invoke a sense of unpredictable excitement. This appears to be intensely attractive to a large number of foreign visitors. Additional products offering include extended wilderness type trips as well as shorter, easier weekend type walking safaris and/or nature photography tours suitable for families and older visitors to complement the aforementioned 3 to 4 day trekking tours. However, the sequence of introducing tourist activities in CH/12 should allow for phasing-in activities that take into account animal habituation foremost. As such, game drives are recommended foremost before walking safaris can be undertaken to avoid dangerous wildlife previously subjected to hunting pressure. Apart from the risk to human life, animals exposed to previous hunting regimes have also proved to be wary, elusive, and evasive of human presence, thus posing an initial challenge to photographic tourism.

7.4.7 It is genuinely believed that the above ecotourism products could meet most of the market's demand over the first years of this ecotourism development strategy for CH/12. At a later stage, or even parallel to the aforementioned ecotourism products, it will be necessary to diversify and expand the ecotourism programmes capable to attract other special interest tours and increase

revenue generation for the concession. Besides exclusive, low intensity 4x4 game viewing experiences, these programs are likely to include:

(i) Walking safaris for special interest groups

(ii) Elephant trekking and wilderness camping;

(iii) Guided cultural excursions to surrounding communities offering a glimpse of local lifestyles and traditional handicrafts;

(iv) Animal back- riding (activity which may require management approval from the relevant authority)

7.4.8 Besides CH/12's airstrip, access road and trail system already in place, the development of quality trekking-based and other ecotourism products in the concession as summarized above would require investment in other essential infrastructure and facilities including mobile campsites, viewing points, and eco lodge accommodation. Furthermore, it will be crucial for all infrastructures to adhere to best practice and ecotourism standards in accordance with the guiding principles of ecotourism and the expectations of visitors participating in ecotourism programmes. It is genuinely believed, that infrastructure that has minimal environmental impacts and uses architectural design styles that blend with the natural environment will demonstrate the CH/12's Tourism Management Plan's commitment to true ecotourism practice and enhance the programmes reputation in the regional ecotourism market.

The Target Market

7.4.9 The situational appraisal revealed that CH/12 presently attracts up-market safari hunters from developed countries, especially USA. It is also believed that CH/12 can attract the same up-market photographic tourists when it becomes a non-consumptive concession area. This is particularly due to the fact that the concession area is rather remote and may not be attractive to self-drive tourists. Instead, up-market tourists who are already clients and have a package in their schedule to visit other camps in the Okavango Delta and Chobe might be interested or attracted to visit the concession area. With regard to this, the challenge for CH/12 is to develop a range of quality ecotourism products that will attract visitors, meet market demands and complement other experiences in the Okavango Delta and Chobe region. The focus of the concession on provision of a high quality wilderness experience to a small but affluent clientele would amongst others require substantial investments in very comfortable to luxurious eco-lodge accommodation. Thought investment costs are high it is expected that with effective marketing and a competitive quality product financial returns can also be high.

7.4.10 The target market to be attracted to CH/12 when it becomes a non-consumptive concession area should not be solely focused on up-market clientele. Other distinct visitor groups each with their own profiles need to be taken into account when identifying, developing and marketing CH/12's ecotourism products. The target visitor groups distinguished by levels of expenditures, behavior and/or preferences are summarized in Table 7.1 below:

Table 7.1: Target Visitor Group Profile for CH/12 Ecotourism Programmes

Type of Visitor/ Tourist Group	Financial Budget	Time Budget	Group Characteristics/ General Interest
Package tourist (small group sizes)	Medium	1-4 days	– Tourists who pre arrange and pay for organized package tours. Tend to be professional people between 35 – 45 years. – Interested in short walking safaris, soft adventure, brief cultural village visits. – Tours need to be well organized and professionally serviced as costs and therefore expectations are higher. – A growing market that is accessed by formal partnerships with private tour companies
Special Interest Groups/Visitors	Medium -High	1 – 2 weeks	– Potentially includes bird watching, wildlife viewing, and wilderness safari tours. – This group generally has higher expectations that are commensurate with the higher costs. – Generally operated and marketed by specialist tour companies. – Products need to be well planned and professionally run with expert guides.
Eco lodge/luxury camp visitors	High	3-5 days	– Require very comfortable to luxurious accommodation, wildlife viewing opportunities, undisturbed nature, scenery, relaxation, and tours guided by professional guides. – This group has high expectations and in very many cases comprise of older, professional or retired people.

7.5 TOURISM CARRYING CAPACITY ANALYSIS FOR CH/12

7.5.1 During the field surveys and site inspections, efforts were made to qualitatively assess the potential impacts of tourism activities, facilities and development in CH/12 in order to ensure the protection and conservation of the biodiversity and natural resources of the concession area. Maintaining use levels within the CH/12 capacity is important in terms of allocating ecotourism opportunities and ensuring that the concession area is not subjected to over-utilisation.

7.5.2 Analysis of the tourism carrying capacity is generally associated with determining the level of tourism use a given site or area can accommodate and then comparing the use level to established standards. However, capacity is a complex issue and often requires more than an estimate of how many people can use a given site at any time. Capacity is also dependent on the type and severity of environmental impacts, available space or accommodation facilities, and the social perceptions of visitors to the site, among other variables. To account for the complexity of capacity at CH/12, three types of tourism carrying capacity were investigated for CH/12 namely:

1. **Environmental Carrying Capacity** - concerned with impacts of tourism activities on the environment of CH/12. The following issues were the subjects of qualitative observation and assessment: (a) Bare ground extent; (b) Littering; (c) Sanitation (d) Vegetation damage (e) human-wildlife interference;

2. **Spatial Capacity**—concerned with space-related impacts, such as the location and the number of the existing tourism facilities, number of people and/or groups occupying specific areas, or the ecotourism expansion potential of the concession area.
3. **Social Capacity**—concerned with social impacts, such as perceptions of crowding (assessed from field observation and from CH/12 management and other stakeholders), as well as perceived and actual conflicts between different visitor groups.

Environmental Carrying Capacity

7.5.3 During the field visits it was observed that there are no activities, which are potential sources of serious pollution. The current use of the concession during the seasonal hunting period (April-September) does not appear to have a widespread impact on the ecological integrity of the area and its developed accommodation site. Most observed environmental impact tended to be very minor and localized.

7.5.4 Environmental capacity was not considered a limiting factor at the existing Bottle Pan Camp area. Moreover, environmental concerns at the Bottle Pan Camp are likely to be minimized by the high level of site maintenance that the Concessionaire Management provides. However, there is potential for ground-water contamination with faecal bacteria and nitrates from the soak away septic tank drainage used for sewage waste disposal. Although field observations revealed that the problem is at present minor there is necessity to undertake facilities upgrading and other efforts aimed at minimising sanitation impacts. A general decommissioning/commissioning of the Bottle Pan Camp site shall be required in order to elevate standards of the facility and further minimize or eliminate the potential for environmental concerns.

7.5.5 One environmental impact noted relates to number of user-defined 4WD trails and pathways that were identified in some areas of CH/12. Some of the identified trails or pathways exhibit vegetation trampling, though management suggests that these trails are subject to full recovery during the rainy season, if not used extensively. This problem however is considered not to be widespread and serious.

7.5.6 Concerns have also been expressed about the impact of elephants on the structure and density of vegetation in the study area. In this regard, it was noted that the resident wildlife population in CH/12 has recently been increasing presumably as a result of permanent water provision. Observation revealed that the estimated density of less than 1 elephant per km^2 is still within the area's carrying capacities. However, in the areas surrounding the permanent water points, the impact of elephants on the structure and density of vegetation has been reported as significant. Specifically, environmental reports by the Concessionaire state that large trees around the pans have been reduced to low or medium sized shrubs in the period between 2004 and 2010. The opposite, however, occurred for the areas away from permanent water points where a higher number of medium-to- tall trees was reported. Elephant impact on vegetation is at present minor, but observations point to the necessity to undertake measures that would ensure that the damage done by elephants is mitigated through active natural resource management and protection of the most valuable wood resources in CH/12 in tandem with the Tourism Management Plan for CH/12 and associated legislative or administrative instruments

7.5.7 Noise pollution from diesel generators pumping water into pans throughout CH/12 have also been observed as a concern that is likely to diminish the scenic quality of the CH/12 environment.

7.5.8 In summary, environmental impacts are not considered limiting in CH/12 area at present, because of the existing emphasis placed on the management and protection of wildlife habitat. Potential environmental impacts should however be monitored as ecotourism use of the study area is likely

to increase in the future. The situational appraisal revealed that improvements of the Bottle Pan Camp relative to artificial water points would be required to reduce potential environmental impacts in the future. To this end, the present Concessionaire already plans to replace commencing March 2013, all diesel borehole pumps, with solar-powered ones similar to the KCS-sponsored ones operating in Chobe National Park.

Spatial Capacity

7.5.9 This part of tourism carrying capacity analysis considers spatial capacity of the concession area in terms of its ability to absorb additional tourism facilities. An appraisal of the situation within CH/12 revealed the following:

(i) CH/12 is capable of providing additional recreational use and facilities. However, concern over likely impacts on wildlife and its habitat, notably the intent to retain CH/12's "wilderness appeal", limit the potential for extensive future ecotourism development in the concession area.

(ii) While the location of Bottle Pan Camp limits large-scale site expansion due to wildlife habitat and vulnerability to human-wildlife interactions, the potential does exist to add new, low-density facilities. Specifically, the existing Camp overlooking Bottle Pan area appears underutilized and could accommodate higher use levels. In this regard, it is envisaged that the existing accommodation capacity in the camp could be expanded by a maximum of 18 beds to create additional capacity (see Table 7.2).

(iii) It is also considered appropriate to emphasise that CH/12 has a vast zone to the east and south east of the existing cut line and along the fossil Nunga River valley. From the spatial perspective, the potential does exist to accommodate an additional semi-permanent camp of maximum 30 beds, but would need to be planned in conjunction with wildlife habitat, animals' migratory routes and natural resource conservation measures.

(iv) Guided walking trails, and overnight camping in a limited number of dispersed and mobile "pack it in, pack it out" wilderness campgrounds, especially close to permanent water point, may be allowed in CH/12 without compromising biodiversity and the natural landscapes of the concession area. This could be an opportunity for the prospective concessionaires to grow tourism without causing impacts through the establishment of additional lodges.

7.5.10 Overall, spatial capacity is considered a limiting factor in CH/12 due to the lack of significant expansion potential in the concession area because of wildlife habitat concerns in the area and the need to maintain its wilderness appeal.

Social Capacity

7.5.11 Given the current land use in CH/12, potential visitor conflicts in terms of overcrowding and trespassing are perceived as not being a problem though trespassing may escalate with the envisaged expansion of agricultural activities in the Pandamatenga area.

7.5.12 Thatching grass harvesting was however noted as a concern by the Concessionaire and Camp Management. Although grass harvesting activities were noted to be under control, they have the potential to increase in CH/12. In particular veld fires associated with grass harvesting activities may impact negatively on wildlife and vegetation in the concession area.

7.5.13 Non-restricted vehicular access to CH/12, with the associated user-defined trails and pathways, has been identified as a concern that could potentially lead to congestion of the area by itinerant visitors who could disturb wildlife, engage in poaching and cause habitat fragmentation and deterioration. However, it is believed that this type of impact is negligible, given numbers of

visitors reportedly accessing the area and the limited time frame the visitors can potentially spend in the area.

7.5.14 Overall, there are limited social impacts and human conflicts that could impede the development of tourism activities in CH/12 at the moment. However, the aforementioned potential for future ecotourism development in the concession area is a warning that social impacts should be carefully monitored over time.

Conclusion on Tourism Carrying Capacity of CH/12

7.5.15 In conclusion, non-consumptive tourism use within CH/12 is considered to be within acceptable limits. Specifically, the current tourism use of CH/12 even during the peak season does not appear to have a widespread impact on the environment. Environmental concerns at the developed semi-permanent camp near Bottle Pan are minimized by the high level of on-site maintenance that the current Concessionaire provides. The presence of on-site management has also minimized the potential for sanitation concerns. However, further improvements of tourism facilities will be required. This particularly speaks to the commitment to "go "green" by gradually replacing the present diesel generator-based power supply with solar power, as well as to infuse technological interventions and innovations that would minimize the potential for sanitation concerns raised from becoming real issues.

Table 7.2: The Current and Envisaged Accommodation Capacities together with Density Indicators and Waste Generation Estimates in CH/12

Camp	Current Capacity (No. of Beds)	Expansion threshold (Total No. of Beds)	Difference
Accommodation Capacities			
Existing Camp (Bottle Pan)	**6**	**24**	**+18**
New Camp Site	**-**	**30**	**+30**
TOTAL CH/12	**6**	**54**	**+48**
Indicators and Estimates			
Total Number of people (hypothetical maximum in a peak season)			141
Estimated No. of game drive vehicles carrying 6 visitors per vehicle			9
Land to Guest Ratio (in km^2)			26.8 km^2/guest
Game drive vehicle density (km^2 total area /per game drive vehicle)			161 km^2/ 4WD
Daily wastewater generation (hypothetical maximum)(2)			11.7 m^3
Monthly wastewater generation (hypothetical maximum)			351.0 m^3
Daily solid waste generation (hypothetical maximum) (3)			70.36 kg
Monthly solid waste generation (hypothetical maximum)			2.11 t

1) *The average wastewater generation rate for camp/lodges is estimated at 83 liters/capita/day (Source ODMP, Waste Management Strategy, 2006)*

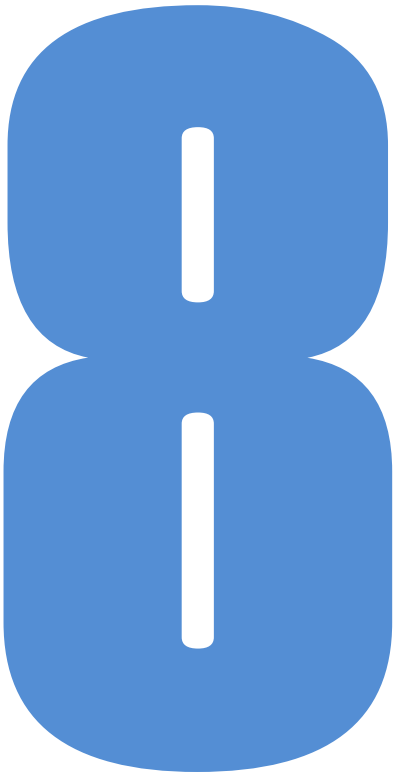
2) *The average per capita solid waste for camp/lodge is estimated at 0.85 kg/bed/day and 0.28 kg/capita/day for supporting staff (Source ODMP Waste management Strategy, 2006)*

7.5.16 CH/12 is a comparatively large, dry-land concession area with unspoilt natural landscapes and wild animals as a key feature. The size of the concession area, together with the vast extent of neighboring concessions and forest reserves is one of the greatest advantages that make these areas unique. The areas form an environmental unit and are inter-dependent, especially in terms of ecosystem connectivity. Consequently, these wildlife habitat concerns, as well as a need to preserve the area's "wilderness appeal" significantly limit the potential for large-scale development of ecotourism facilities. Though the existing developed site at Bottle Pan could potentially accommodate additional facilities, no new areas surrounding the existing Camp should be

developed as new camp/lodge sites. In addition, spatial use restriction should also apply to the wildlife routes in the concession area. Potential impacts of tourism on sensitive animals, especially large mammals should continue to be monitored.

7.5.17 Other parts of CH/12 which are located some considerable distance away from the Bottle Pan Camp seem not fully utilized. In this regard, the suggestion that CH/12 has reached optimal use as summarized above, may apply only to the Bottle Pan Camp and its surroundings, and does not necessarily represent capacity issues in the entire concession. As such, capacity levels for the Bottle Pan Camp area are higher, while those farther away from it have not been exploited. In this regard, additional low-density tourism facilities can still be developed in the outlying areas (Table 7.2)

7.5.18 Social capacity are limited at this moment but should be monitored. Management actions would however be required to strengthen all forms of regulation/law-enforcement aimed at regulating the use of natural resources in CH/12. This relates to poaching and thatching grass harvesting issues which were noted as concerns.



Zonation for CH/12

CHAPTER 8: ZONATION FOR CH/12

8.1 PROPOSED ADMINISTRATIVE AND LAND USE DESIGNATION OF CH/12

8.1.1 The Government of Botswana has taken a decision to stop consumptive tourism use in CH/12 and surrounding concession areas, particularly those falling within the 25 km buffer zone around protected areas. In addition to this, it was highlighted in the chapter two of this Report that CH/12 is also a part of the Kavango-Zambezi Transfrontier Conservation Area (KAZA TFCA) which is an initiative between Angola, Botswana, Namibia, Zambia and Zimbabwe established to facilitate concerted transfrontier conservation and tourism development in the Kavango and Upper Zambezi River Basin. Consequently, the integration of CH/12 tourism activities must be carefully considered so as not to compromise the goal of this regional initiative.

8.1.2 Given the above-mentioned facts, as well as ecotourism potentials summarized in the previous sections, this Plan recommends that CH/12 be designated as a "***Commercial Photographic Concession".***

The "Photographic Concession" means the resource base upon which activities hinge, will not be physically consumed, extracted, harvested or removed, but remain in place for future tourism use.

The "Commercial Concession" means that CH/12 is subject to granting of rights for use of the whole area or its portions.

8.1.3 The evaluation of different administrative zoning scenarios revealed that the "Single Concession" scenario, as opposed to the "Multi-concession" administrative zoning scenario is preferred for CH/12 since it is more practical to implement.

Accordingly, this Tourism Management Plan proposes that ***CH/12 continues be leased to a single commercial operator ("a Single Photographic Concession").*** The prospective commercial operator or concessionaire shall be granted exclusive rights to:

(i) Conduct non-consumptive commercial tourism activities in the whole CH/12;

(ii) Carry out all required biodiversity, ecosystems and natural resources management activities outlined in this Management Plan and as indicated and agreed to in the lease agreement.

(iii) Carry out reasonable in situ monitoring of wildlife and biodiversity according to approved guidelines provided by the DWNP, DWA, DFRR and other relevant government authorities;

(iv) Have rights in controlling access to the whole concession area for the purpose of natural resource extraction or any other commercial purpose;

(v) Have exclusive right to controlling access and appoint mobile tourism operator(s) who may use wilderness and other campgrounds proposed in the concession.

8.1.4 The prospective concessionaire shall be required to prepare "Concession Area Accessibility Guidelines and a Code of Conduct" to maintain sustainable wilderness experience opportunities throughout the entire CH/12. An understanding of the access requirements of all stakeholders involved either in natural resource consumption or mobile tourism activities is critical in minimizing conflicts.

8.1.5 In terms of time frame, this Plan recommends that ***CH/12 continues be leased for a period of 15 years.*** This period will accord concessionaire an opportunity to make a fair return on the capital and expertise they invested in their enterprises and also allow them to comply with all the requirements of this Tourism Management Plan.

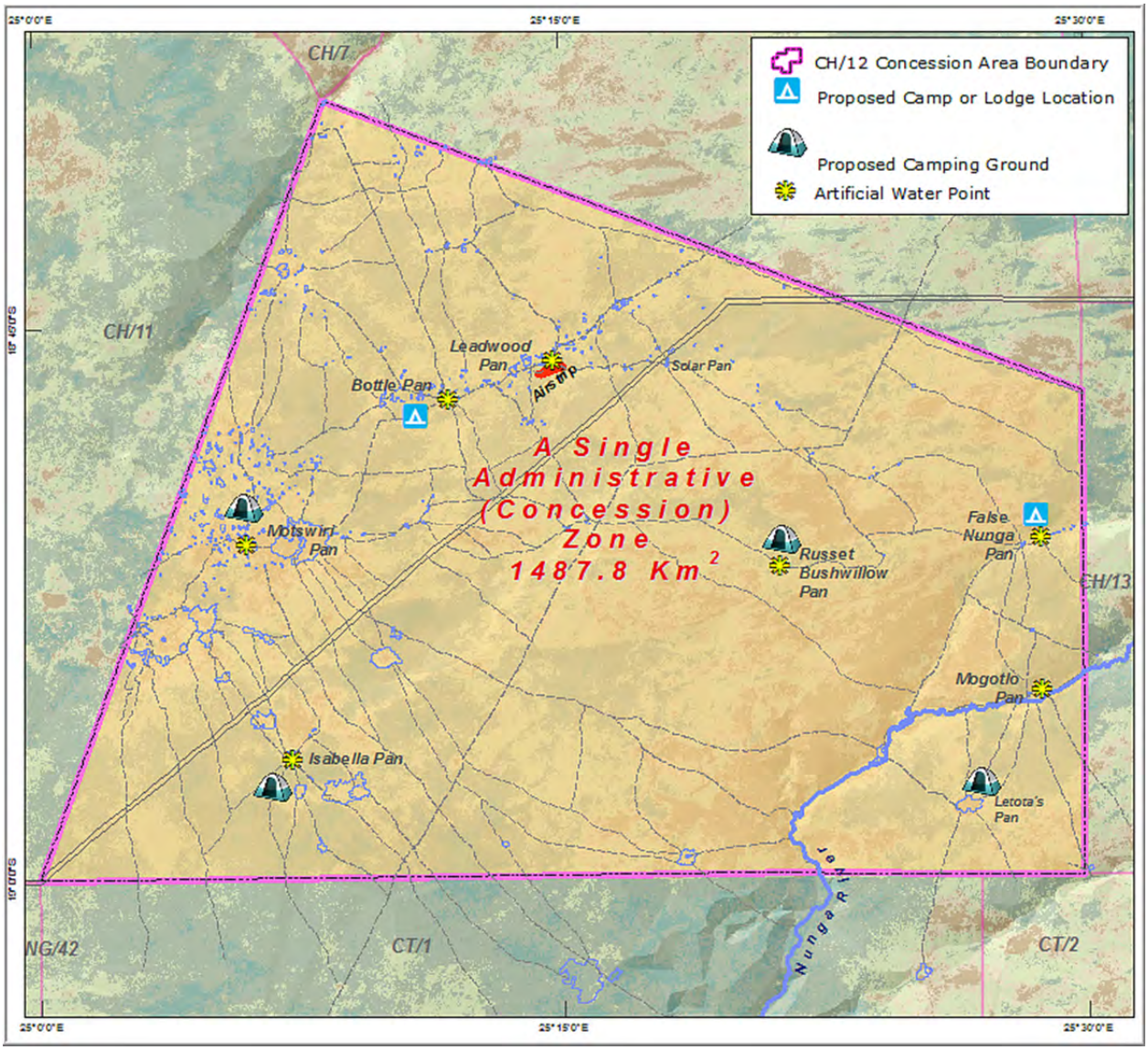


Figure 8.1: CH/12 area boundary to be leased to a single concessionaire for the purpose of conducting non-consumptive commercial tourism activities

8.2 PROPOSED ECOTOURISM MANAGEMENT ZONES FOR CH/12

8.2.1 This Tourism Management Plan recognizes that in order to unlock the non-consumptive ecotourism potential of CH/12 in a sustainable manner with minimum disturbance and human intervention, it is essential to put in place management mechanisms that respect the environmental integrity and the tourism potential of the concession area. An important part of this management mechanism relates to the proposed eco-tourism zoning scheme of CH/12 (Map 8.1). The scheme aims at enabling the integration of ecotourism development within conservation priorities identified in different areas of CH/12. Accordingly, its purpose is fourfold:

(i) To provide a spectrum of resource conditions and tourism opportunities within each ecotourism management zone;

(ii) To identify the level and intensity of usage that is acceptable based on the current understanding of sensitivities prevailing in different areas of CH/12.

(iii) To indicate which management directions should have priority in each ecotourism management zone

(iv) To provide specifications on the scale of facilities permitted within each ecotourism management zone

8.2.2 Generally, the intent of establishing eco-tourism management zones is to maintain acceptable tourism opportunities and resource conditions. These conditions represent the maximum limit of change which is allowed. Zonation is also used to identify areas in which a tourism facility and related infrastructure may be located. Map 8.1 presents the layout of the proposed ecotourism management zones in CH/12. As can be gleaned from the map, CH/12 is divided into two ecotourism management zones:

(i) Management Zone 1: Western Exclusive Wilderness Zone;

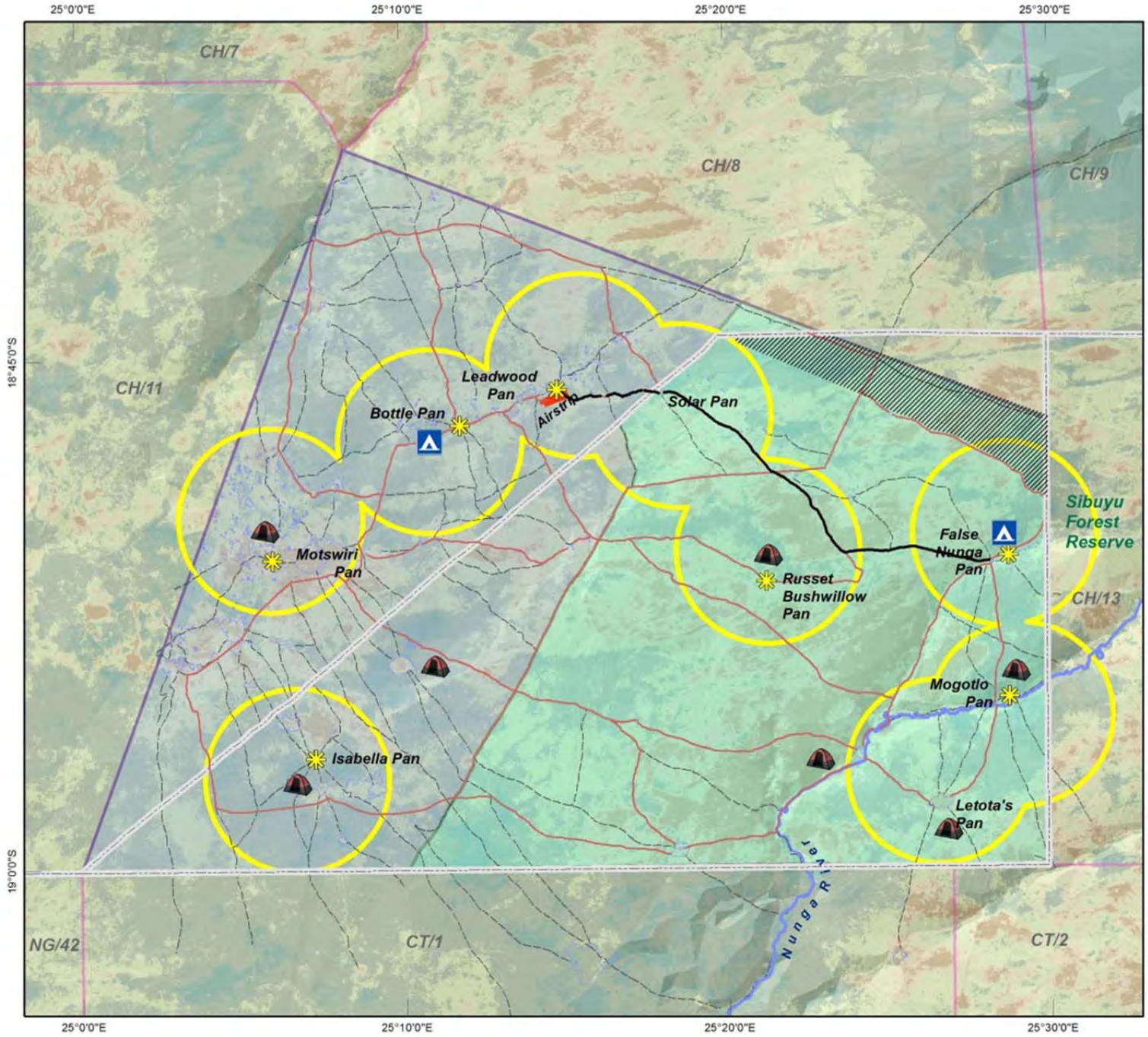
(ii) Management Zone 2: Eastern Low Density Semi-Wilderness Zone

8.2.3 In determining the CH/12 zoning scheme two factors have been taken into account, namely: a) prevailing ecosystem and habitat sensitivity, as well as b) ecotourism attractions and opportunities along with related facilities and management requirements. Furthermore, zone names have been chosen to indicate both the appropriate level and type of management input for ecotourism, and the environmental qualities of the zones.

8.2.4 With regard to environmental qualities the ecotourism management zones in CH/12 are branded as either 'wilderness' or 'semi-wilderness' zone. Although wilderness means different things to different people, there is a general consensus on its essential features. For the purposes of this Tourism Management Plan the definition of - wilderness "as an expanse of land retaining its natural character, affected mainly by the forces of nature with the impact of human being substantively unnoticeable" - has been adopted. It is aligned with the globally accepted definition of wilderness devised by International Union for Conservation of Nature (IUCN). On the other hand, the term 'semi-wilderness' not only relates to areas of relatively high wilderness quality as defined above, but also areas that are prone to human impact or have been impacted, often as a result of relatively low levels of use such as resource harvesting.

8.2.5 In addition to the above, the CH/12 zoning scheme should be seen as an integrated composition of its values and general management principles that can be applied to each ecotourism management zone. While key values are identified for each of ecotourism management zones, therefore indicating priorities for management, the primary management goal and objectives outlined in the previous chapter apply to CH/12 as a whole. Particular high value attributes such as sensitive vegetation communities or significant wildlife concentration can occur anywhere in CH/12, and require appropriate protection and management whether or not they are identified as a key value for the zone in which they occur.

8.2.6 The sections that follow provide descriptions of each ecotourism management zone in terms of zone intents, management objectives, development potentials and management priorities.



Tourism Management Plan for CH/12

Ecotourism Management Zoning

Legend

- Eastern Low Density Semi-Wilderness Zone
- Western Exclusive Wilderness Zone
- Semi-Permanent Camp or Lodge Location
- Provisional Wilderness Camping Ground
- AWP (Wildlife Viewing/Scenic Vista)
- Cut Line (Major Access Road)
- Tentative Wilderness Standard Trail System
- Airstrip - False Nugna Camp Site Connection
- Trail
- Airstrip
- Pan Depression
- Fossil River Channel
- No Flying Lower than 1500 Feet Zone
- Designated Grass Cutting Zone

Consultant: GIS Plan

Client: botswana tourism

NORTH

1:300,000

0 2.5 5 10 15 Kilometers

Coordinate System: UTM Zone 35- Datum WGS 84

Map 8.1

8.3 MANAGEMENT ZONE 1: WESTERN EXCLUSIVE WILDERNESS ZONE

Zone Intent:

8.3.1 The zone encompasses the western side of CH/12. It is a portion of the concession where resident wildlife species are mostly concentrated due to a highly palatable *Acacia sp*. and *C. mopane* plant communities prevailing around seasonal and artificial (permanent) water sources. This zone stands as CH/12's best area for game viewing and wilderness experience.

8.3.2 The zone represents an area of relatively high sensitivity with regard to wildlife-environment interactions and therefore any tourism development must be carefully tailored to prevent disturbance and unacceptable levels of environmental and ecological changes.

8.3.3 The zone is intended to provide wilderness experiences to a smaller and generally affluent, clientele. The principal experience being marketed in this zone is that of "exclusivity, isolation, solitude and tranquillity in an African wilderness". In this zone, the tourism experience emphasizes personal and small group interaction and physical activity within pristine natural landscapes. The emphasis on well-trained guides per tourist also increases the employment level.

Zone Attractions:

8.3.4 The main attractions of the Zone are:

(i) A diversity of vegetation habitats supporting a relatively higher density and diversity of resident wildlife in comparison with other zone in CH/12;

(ii) Wilderness appeal, together with opportunities for close interaction with some of "big game" wildlife species (elephants, buffalos, lions and leopard);

(iii) Remote natural environment with a number of "wildlife viewing and scenic vistas" around natural pans and artificial water points

(iv) Opportunities independence, tranquillity and solitude;

Preferred Market: ***High-End (Luxury) Ecotourism***

Zone Objectives:

8.3.5 The maintenance of the natural settings, so that it retains its wilderness appeal, is the key management challenge in this zone. In this regard, the primary objectives of the Zone are:

(i) To retain exclusive use intensity in order to keep the wilderness experience marketable for affluent clientele;

(ii) To retain unmodified natural settings and use wilderness as a primary means of managing, protecting and conserving the area's natural values;

(iii) To progressively assess the existing accommodation facilities and provide for their decommissioning/commissioning in order to protect/maintain wilderness character and/or restore desired conditions to impacted areas

(iv) To closely monitor campgrounds and artificial water points within the zone to ensure that impacts remain within acceptable levels and, if necessary, initiate site and visitor management strategies to control environmental degradation;

(v) To provide and maintain appropriate access control in order to preserve the sense of isolation;

(vi) To limit vehicle access to exclusive game drives. This also applies to transport of visitors, management, search and rescue purposes and only where there are no feasible alternatives;

(vii) To encourage aircraft operators to adopt the zone's accessibility guidelines and a code of conduct including appropriate routes and minimum flight heights

8.4 WESTERN EXCLUSIVE WILDERNESS ECOTOURISM MANAGEMENT ZONE: TOURISM DEVELOPMENT POTENTIAL AND MANAGEMENT RECOMMENDATIONS

Permitted Activities

8.4.1 Remote lodging, exclusive game drives, guided walking safaris, nature photography tours, wildlife trekking and overnight camping in a limited number of wilderness campgrounds may be allowed in this zone, without endangering biodiversity and the unspoilt natural landscapes of the zone.

8.4.2 Over the time frame of this plan, new tourism activities may emerge that have not been catered for or specifically considered. In determining whether or not a tourism (recreational) activity may be permitted in the Zone, consideration shall be given to:

(i) Assessment of the activity at the concession level, with respect to level of acceptable changes and competing tourism products utilizing the same land resources;

(ii) Relevant legislative provisions and government policies; and

(iii) Public health, safety and the exposure of the zone management to risks;

8.4.3 It shall be a requirement for any of the new outdoor tourism activities that may emerge in the zone and not mentioned under the zone's permitted activities (paragraph 8.4.1) to complete an Environmental Impact Assessment Study, following procedures prescribed by the Department of Environmental Affairs and EA Act of 2010.

Accommodation Capacity Thresholds

8.4.4 The capacity analysis in the Scoping Report revealed that wildlife habitat concerns together with the need to retain largely unmodified natural settings, limit potential for any new camp in this zone, without endangering its value and the quality of visitor recreation experiences. Accordingly, apart from the Bottle Pan Camp no new semi-permanent or permanent sites in this Zone shall be developed.

8.4.5 The potential, however, does exist to increase the capacity at Bottle Pan Camp, whilst still maintaining the low use characteristics of the Zone. In this regard, the proposed Plan allows for increase in accommodation capacity of the existing Bottle Pan Camp from the existing 6-visitor bed capacity up to a total of 24 beds.

8.4.6 Given that the Zone is to provide a high quality, non-consumptive wilderness experience, there shall be a management requirement for the current leaseholder to decommission the existing Bottle Pan Camp.

8.4.7 Phasing out the existing Bottle Pan Camp shall be subjected to the provisions of the lease agreement, well as prescriptions contained in Environmental Management Plan for the Camp. The decommissioning process of the Bottle Pan Camp shall be addressed in liaison with the Chobe Land Board.

8.4.8 This Plan furthermore, recommends that the prospective concessionaire who will win the tender for operating CH/12 shall be required to explore options of placing the new "24-beds" camp or lodge in the periphery of the Bottle Pan Water Point. The reasons are twofold, namely:

(i) To simultaneously reduce the impact and pressure on the Bottle Pan whilst increasing the visitor density from six (6) to 24 persons;

(ii) To elevate quality of the facilities and services required for non-consumptive upper market lodging.

8.4.9 In general, the challenge facing the commissioning of a new camp or lodge is to accommodate use near the Bottle Pan water point, while minimizing or eliminating the environmental and/or ecological impacts, so that wildlife and its movement is not disturbed.

8.4.10 Commissioning of the new 24-bed, luxury accommodation facility attuned for photographic tourism purposes, shall be subjected to the provisions of the Environmental Assessment (EA) Act of 2010 and approved by the Chobe Land Board, Department of Environmental Affairs and any other relevant authority in the Chobe District (e.g. Department Waste Management & Pollution Control). In this regard, prior to the new Bottle Pan Camp's commissioning process it shall be the concessionaire's obligation to prepare an "Environmental Management Plan (EMP) to ensure that any environmental impacts caused by commissioning operations are remediated and compensated.

8.4.11 The required EMP shall be an action-specific plan developed to ensure that appropriate environmental management practices are followed during the commissioning phase of the new Bottle Pan Camp and to detail all remediation, site control, and monitoring activities. The Plan shall provide effective site and action-specific and implementable procedures, as well as mitigation measures to monitor and control environmental impacts throughout the commissioning phase of the project, such that the related activities do not adversely impact on the biodiversity and tourist values of the surrounding area.

8.4.12 Following submission of the EMP, the plan shall be reviewed by Chobe Land Board (CLB), Department of Environmental Affairs (DEA), Botswana Tourism Organisation (BTO) and any other relevant authority to verify that all sections are complete and that it meets the stipulated requirements

8.4.13 As a part of EMP for the new Bottle Pan Camp, the prospective concessionaire shall also be required to prepare the Site Plan presenting details on the new photographic camp or lodge location and spatial layout of its elements. The site plan shall be reviewed by Chobe Land Board, BTO, Department of Environmental Affairs and any other relevant authority to verify that the camp or lodge design and location do not deviate from the prescriptions of this Plan and other relevant policies without consent.

8.4.14 The design of the new accommodation facility should follow recommendations of the Botswana Ecotourism Best Practices and the Botswana Ecotourism Certification System developed by BTO and summarised in section 8.7 of this Tourism Management Plan.

Bottle Pan Camp Decommissioning/Commissioning Process

8.4.15 During the Bottle Pan Camp decommissioning/commissioning processes, it shall be the leaseholder responsibility to demonstrate that the selected contractor can respect the specific environmental conditions of working in sensitive sites. This especially includes understanding of how to protect and rehabilitate local vegetation and ecosystems.

8.4.16 The leaseholder shall also demonstrate that there will be continual site supervision over the duration of the Bottle Pan Camp (de)commissioning period. Complete site rehabilitation must occur in order to ensure that wilderness ecotourism opportunities are maintained.

8.4.17 During camp (de)commissioning process, consideration shall be given to protecting the natural and wildlife resources of CH/12. While hazard mitigation will be required, under no circumstances shall pure convenience dictate the destruction of any of the area's resources. "Leave No Trace" minimum impact techniques must be incorporated into action plans and used whenever possible to lessen impacts on recommended wilderness resources during (de)commissioning operations.

8.4.18 Potential impacts to soils and terrain during the Bottle Pan (de)commissioning activities are likely to include:

(i) Dust during excavation activities;

(ii) Compaction of sub-soil from equipment;

(iii) Risk of soil contamination from accidental spills;

(iv) Erosion of disturbed areas by wind or rain;

8.4.19 Mitigation measures and best management practices shall, therefore be proposed in the aforementioned EMP to avoid erosion. Rehabilitation methods should reduce the bulk density of the soil, thereby encouraging re-vegetation and water penetration. Measures should also include the removal of potentially contaminated soil from the site.

8.4.20 Potential effects of the Bottle Pan Camp (de)commissioning process on the vegetation are mostly related to possible damage to vegetation resources, including rare plants and plant communities. Accordingly, measures to avoid vegetation damage during (de)commissioning process should also be considered and implemented.

8.4.21 With regard to wildlife, potential adverse effects of (de)commissioning activities are likely to be minor and concentrated predominantly on temporary disruption of traditional wildlife movement patterns from anthropogenic sensory disturbance. It is anticipated that demolition, reclamation and transport activities involved in (de)commissioning of the Bottle Pan Camp may require the use of machinery, which may increase noise and human activity in the area. However, given the temporary and short-term nature of commissioning activities, it is unlikely these activities will result in an adverse cumulative impact on wildlife.

8.4.22 If required, the use of any temporary road access to Bottle Pan shall be strictly controlled before, during and after (de)commissioning. Deactivation and complete site rehabilitation along the designated temporary roads must then occur in order to ensure that wilderness ecotourism experience opportunities are maintained.

8.4.23 In addition to demolition, reclamation and track movement, potential accidents that may affect the environment during these activities are limited to accidental spills during on-site (de)commissioning, which can be readily mitigated.

8.4.24 It is also envisaged that, local rainfall, especially thunderstorm during November to March is the one environmental condition that may affect the Bottle Pan (de)commissioning process. It is therefore suggested that the Bottle Pan (de)commissioning process should be optimally planned during the dry season when probability for significant rainfalls which can have adverse impacts on site is low.

8.5 EASTERN LOW DENSITY SEMI-WILDERNESS MANAGEMENT ZONE

Zone Intent:

8.5.1 The zone encompasses the eastern side of CH/12. It is a portion of the concession area dominated by *Terminalia sericea* plant community, which (when in good condition) provides valuable year-round habitat for Roan antelope, as well as other selective feeders including elephants. The zone furthermore includes areas of relatively high wilderness quality, such as areas along the Nunga River valley and around False Nunga Pan. However, especially in its northeast portion, it also includes some areas that have been impacted by human activities usually in form of natural resource harvesting.

8.5.2 This zone stands as the CH/12's second best area for game viewing with ecotourism potentials related to scenery, wildlife viewing vistas around natural pans, as well as mobile safaris and camping experiences. It is, therefore envisaged that non-consumptive wilderness tourism experiences to be offered in this zone will be dependent on relatively higher visitor density than the density suggested for the western wilderness ecotourism management zone. Accordingly, instead of exclusive accessibility, this zone provides for visitor density which is expected to be high enough to commercially sustain the tourism products and related infrastructure in the zone, and on other side, low enough and managed appropriately so that it does not negatively affect the environment and tourism experience within the zone.

8.5.3 The aim of this zone is to provide areas for exclusive motorised and non-motorized tourism in the dry, largely unmodified natural wilderness settings.

Zone Attractions:

8.5.4 The main attractions of the Zone are:

(i) A dryland wilderness appeal including panoramic views around False Nunga AWP, as well as along the Nunga River fossil valley;

(ii) Relatively unaffected natural environment with a number of wildlife viewing and scenic vistas around natural pans and artificial water points

(iii) Opportunities for solitude and isolation

(iv) Possibilities for limited signs of human activity (if managed properly) accompanied with opportunities for sighting wildlife.

Preferred Market: ***Mid- to- High-End Ecotourism Segment***

8.5.5 Besides high-end remote lodging visitors, the mid-range ecotourism market segment typified by tour guide-conducted groups, pursuing nature-based recreational activities is recommended in this zone, where there are opportunities to grow tourism using mobile camps.

8.5.6 This will require the prospective concessionaire to take responsibility for conducting its own tourism activities, or identifying mobile operators, who will be restricted to certain areas within the zone and subject to a strict code of conduct that ensures visitor experiences expected for the area.

Zone Objectives:

8.5.7 The primary objectives of the Zone are:

(i) To maintain the zone's biodiversity in all its forms and to minimise any visual impairment of the "natural" landscape;

(ii) To tolerate a relatively higher intensity of nature based recreation activities provided that they do not compromise or damage the natural environment and allow existing natural condition to operate with minimal interference

8.6 EASTERN LOW DENSITY TOURISM ZONE: PROPOSED TOURISM DEVELOPMENT POTENTIAL AND MANAGEMENT PRESCRIPTIONS:

8.6.1 Due to the vulnerability of the zone especially with regard to its objectives and intent, it is important that management mechanisms be in place to prevent negative environmental impacts. Tourism carrying capacity thresholds recommended in this Plan (Table 8.1 and Table 8.2) shall be applied in order to achieve a sustainable eco-tourism industry in the zone and avoid unacceptable levels of biodiversity changes. These thresholds are expected to be monitored and reviewed periodically by the Concession Management on the basis of expert advice.

Permitted Activities

8.6.2 Low intensity game driving, guided walking safaris, nature photography tours, animal back-riding, wildlife tracking and overnight camping in a limited number wilderness campgrounds, can be allowed in this zone, without endangering biodiversity and natural landscapes of the zone. The zone could also become an educational centre that provides opportunities for tour guides in elephant trekking.

8.6.3 Over the time frame of this plan, new tourism activities may emerge that have not been catered for or specifically considered. In determining whether or not a tourism (recreational) activity may be permitted in the Zone, consideration shall be given to:

(i) Assessment of the activity at the concession level, with respect to level of acceptable changes and competing tourism products utilizing the same land resources;

(ii) Relevant legislative provisions and government policies; and

(iii) Public health, safety and the exposure of the zone management to risks;

8.6.4 It shall be a requirement for any of the new outdoor tourism activities that may emerge in the zone and not mentioned under the zone's permitted activities (paragraph 8.6.1) to complete an Environmental Impact Assessment Study, following procedures prescribed by the Department of Environmental Affairs and EA Act of 2010.

Accommodation Capacity Thresholds

8.6.5 The tourism capacity analysis revealed that the area's vulnerability together with the need to retain relatively unmodified natural settings limit potential for permanent or semi-permanent tourism facilities in this zone. This Plan prescribes that one "30-beds camp or lodge" near the False Nunga Pan may be allowed in this Zone. The Camp or lodge shall be attuned for photographic tourism purposes.

8.6.6 Prior to the new camp's commissioning process, it shall be obligation of the prospective concessionaire to prepare a Camp Site Plan for which EIA should be carried out in accordance with the provisions of the Environmental Assessment (EA) Act of 2010. The Site Plan of the new

camp or lodge is expected to elaborate on site selection process and should conform to the Botswana Ecotourism Best Practice Manual, as well as stipulations of this Tourism Management Plan. Furthermore, it shall detail the design and layout of the overall development of the camp and the exact location of its elements. It must be comprehensive and clearly demonstrate that all measures have been considered in ensuring the minimal environmental impact to the selected site and surrounding area. The Site Plan shall also demonstrate that the concessionaire understands the local environment and the environmental issues associated with the development of the site.

8.6.7 Following submission of the Camp Site Plan, it shall be reviewed by the Department of Environmental Affairs, Chobe Land Board, Botswana Tourism Organisation, and any other relevant authority to verify that all sections are complete and that it meets the requirements.

8.6.8 With regard to location of a new camp near the False Nunga Pan, this Plan accentuates the ultimate respect to the environmental context of the site as an important wildlife viewing and scenic vista. Consequently, the Plan recommends that the new camp or lodge should ideally be located not on, but at the periphery of the False Nunga Pan in order to reduce the pressures on the site and ensure that wildlife and its movement is not disturbed.

8.6.9 This Plan also recommends two alternative methods of the new camp or lodge development, namely:

(i) Building a single 30-beds camp or lodge at a selected location near the False Nunga Pan, or

(ii) Allowing a satellite camp to share the 30-beds accommodation capacities permitted in the Zone with a main camp. The satellite camp shall be semi-permanent accommodation facilities with a maximum of 12 beds and infrastructure services aligned with a set of criteria that are going to be prescribed by the Plan to meet environmentally responsible standards or legislation. It can be opened or closed based on seasonal fluctuations in guest numbers. The exact location of this satellite camp will also be subject of site suitability investigation carried out by the prospective concessionaire;

8.6.10 With regard to design of the new camp or lodge, the prospective concessionaire is expected to demonstrate a committed approach to sustainable design, construction and operation that provides a low-impact facility compatible with the surrounding environment. The design of the new accommodation facility should follow recommendations of the Botswana Ecotourism Best Practices and the Botswana Ecotourism Certification System, developed by BTO and summarised in section 8.7 of this Tourism Management Plan.

8.6.11 Given that the maintenance of natural settings and its pristine appeal is the major management goal of this zone, there shall be a management requirement to limit any new interventions within the zone to those which delineate and/or maintain access routes and protect natural resources. In addition, to maintain environmental quality, it would also be a management requirement to avoid any unplanned formation of walking routes and tracks.

8.7 ENVIRONMENTAL CONSIDERATIONS AND PRIORITIES FOR TOURISM ZONES IN CH/12

A New Camp /Lodge Siting, Design and Architecture

8.7.1 This Tourism Management Plan stresses that the appropriate site selection and architectural design of new camps or lodges permitted in CH/12 may be critical if the photographic tourism use industry is to be instigated successfully into the concession area. Design of the new accommodation facilities should follow recommendations of the Botswana Ecotourism Best Practices Manual and the Botswana Ecotourism Certification System developed by BTO. The following requirements are of particular importance:

(i) In siting a new camp or lodge attuned for the non-consumptive tourism purposes, the prospective concessionaire shall, prior to any development, determine the best micro location to construct a new or expand an existing accommodation facility. In this regard, the concessionaire is expected to undertake camp or lodge siting assessment evaluation for each of the concession area's sites designated for that purposes (areas around Bottle Pan and False Nunga pans – Map 8.1). Aesthetics of the area shall be important siting criteria, but the fit with the natural environment is paramount. The site assessment criteria shall, therefore identify and measure potential impacts, issues and constraints associated for each specific site location. It is also expected from the prospective concessionaire to become familiar with site location selection and assessment criteria recommended in the Botswana Ecotourism Best Practices Manual.

(ii) Physical design and operation of the new camp or lodge shall wholly be based on sustainability principles and in-depth understanding of the potential environmental impacts. Accordingly, besides designing a new camp or lodge in the context of good aesthetics, conservation, building technology, materials and construction, energy conservation and efficiency should also become paramount in harmonizing the development with the natural setting of CH/12. The prospective concessionaire shall , in this regard, demonstrate a committed approach to sustainable design, construction and operation that provides a low-impact facility compatible with the surrounding environment;

(iii) It shall be compulsory that the new camp or lodge be built of semi-permanent materials and in a manner that will allow easy removal at the ends of their useful lives. The sourcing of materials should be on the basis of sustainability and appropriateness. Exceptions to this recommendation shall be workshop and maintenance areas, where concrete bonded floors for maintenance and parking will be allowed. Aboveground tanks that are well bonded with concrete to store fuel shall also be encouraged.

(iv) The architectural design of a new camp or lodge shall include the basic requirements of an efficient, comfortable and attractive accommodation but also reflect vernacular and traditional architecture of the region, including shape, colour and materials. The prospective concessionaire shall, in this regard, demonstrate how the design will be compatible with the landscape in terms of material selection. The colour pallets must enhance or blend in with local landscape, not overpower and dominate the natural setting.

(v) The prospective concessionaire shall also be requested to promote a design of the camp or lodge that orientates views towards key features and creates a sense of seclusion. Consideration should also be given to the appropriate scale of development including mass, proportion, layout and composition. In this regard, the prospective concessionaire shall demonstrate that architectural expression of a new camp or lodge does not overpower the local landscape and conveys a sense of place. Architectural form must allow

the surrounding vegetation to dominate the site, not only address aesthetic considerations, but also protect against intense weather conditions. In addition, siting of structures shall not require cutting of trees or disturbing other natural features to gain prominent views

(vi) All camps or lodges permitted in CH/12 are encouraged to be aligned with the "Green" level eco-tourism standards, developed by the Botswana Ecotourism Certification System (BECS). "Green+" and "Eco-tourism" levels will be add advantages in rating concessionaires' commitments in CH/12 biodiversity conservation, environmental management and interpretation of the surrounding environment to guests.

Service Infrastructure:

8.7.2 It is implicit that the operation of new camps or lodges permitted in CH/12 should warrant appropriate services and utilities. Such services and utilities include water, wastewater treatment and disposal, power, heating/cooling and solid waste management. This Tourism Management Plan acknowledges these needs, but also recognizes that services can and should be provided with minimal impact on the environment. In this regard, the prospective concessionaire shall be required to pay considerable attention to environmental performance of service infrastructure in CH/12 and set 'high standards" that would minimize impact on the CH/12 environment and other natural and land based values. An alignment with, at least, "Green" level service infrastructure standards, developed by the Botswana Ecotourism Certification System (BECS) is strongly encouraged.

8.7.3 In order to minimize potential pollution risk to the CH/12 environment, it shall be a requirement for all camps or lodges in CH/12 to determine the appropriateness of their wastewater treatment technology, following recommendations prescribed in the section 10.1 of this Tourism Management Plan. The prospective concessionaires shall be required to avail the existing documentation on detailed investigation of the prevailing site conditions, which will serve to justify the selection and usage of a particular effluent disposal technology.

8.7.4 Monitoring the impact of wastewater management systems on the environment shall constitute a component of their installation. This means that construction of each system should make it possible to obtain effluent samples for analysis of its quality as well as its impact on the surrounding environment. Water samples should be taken from various locations and depths near the system.

8.7.5 To enhance the efficiency of wastewater treatment, the prospective concessionaire shall be encouraged to instigate a policy of using only biodegradable products throughout operations. In this regard, all employees shall be trained in the correct use of these products and the benefits of their use. Furthermore, no camp in CH/12 shall be allowed to purchase derived or synthetic products if a biodegradable alternative is available.

8.7.6 To minimize greenhouse gas emission and oil contamination risks, all camps/lodges in CH/12 shall be required to base their energy requirements on increased deployment of alternative and low impact energy sources. With regard to this, the prospective concessionaire shall be required to follow recommendations stipulated in section 10.3 of this Tourism Management Plan.

8.7.7 The prospective concessionaire shall also be required to explore sustainable means of potable water supply for accommodation establishments in the concession, following recommendations prescribed in Section 10.2 of this Tourism Management Plan. The concessionaire shall be required to avail the existing documentation, which will serve to justify the selection and usage of a particular water supply solution.

8.7.8 Placement of the permitted accommodation and associated facilities in CH/12 must reflect topography of the concession area to ensure efficient stormwater management. The prospective concessionaire shall be required to avoid any grading unless enhancement of a natural system is contemplated.

8.7.9 No public waste facilities shall be permitted in CH/12. It will be the responsibility of the prospective concessionaire to collect, handle and dispose waste off site and in an appropriate way.

8.7.10 On-site management of all camps or lodges in CH/12 shall also ensure the following:

(i) All solid waste is appropriately separated and stored within a covered area, with wildlife-proof cage/storage area on concrete or solid floor to stop leakage and soil contamination, while waiting to be taken to the landfill and recycling centre;

(ii) All biodegradable waste from the facility is composted, or removed;

(iii) All liquid waste from the kitchen, workshop and laundry departments of the facility passes through a fat/grease trap before entering the grey/black water treatment system;

(iv) All fat/grease collected within the trap is regularly removed and stored in a large container for removal to the local municipal land fill;

(v) The Camp/Lodge has an appropriate workshop / wash bay area for vehicle mechanics, with concrete floor that reticulates water run-off; and

(vi) All fuels used for either vehicles or generators are appropriately stored within a concrete bonded area.

(vii) All storage areas are delineated and those sensitive areas where disturbance may be a concern are fenced off with signage, as well as effectively landscaped or screened to ensure that visitors' impressions and visual experience are not negatively impacted by poorly designed storage areas.

8.7.11 In addition to the above, on-site management of all camps and lodges in CH/12 shall also ensure that infrastructure facilities and staff villages are:

(i) Always maintained in a clean, neat and functional state and that these work areas meet Health and Safety standards;

(ii) Located appropriately in the landscape or effectively screened to minimise their aesthetic and other environmental impacts.

8.7.12 Except for visitor safety along the camp or lodge perimeter, fencing shall be avoided as it restricts wildlife mobility and affects the quality of the 'wilderness experience'.

8.7.13 The prospective concessionaire is expected to ensure that development of new camps or lodges in CH/12 has minimal impact on the natural environment. Where possible, the concessionaire shall minimize the construction footprint and ensure that it is accomplished using the minimum tool necessary for the job. Issues such as duration and intensity of noise levels, means of transporting materials and tools to the job site, use of local materials versus materials brought to the site, etc. must be considered in the determination of minimum tool. The construction and rehabilitation of any structure in CH/12 shall, however, be subjected to the provisions of the Environmental Assessment (EA) Act of 2010 and approved by the Chobe Land Board, Department of Environmental Affairs and any other relevant authority in the Chobe District. Subjecting all the construction of physical structures to an EA process shall further ensure environmental protection and sustainable use of resources in the concession area.

8.7.14 To ensure the compliance with the lease agreement, health and safety laws and regulations and all other requirements of the applicable laws, Chobe Land Board and other relevant authorities shall be entitled to inspecting CH/12 at a reasonable time and at regular intervals.

Game Driving Thresholds

8.7.15 The protection of wilderness experiences in CH/12 will require concerted efforts in regulating the number of game drive vehicles per camp or lodge. The objective is to provide opportunities for scenic and game viewing within the whole concession that facilitate appreciation of the range of natural values, but do not conflict with other visitors. In this regard, this Tourism Development Plan prescribes the following:

(i) Optimum eight, but not more than nine 4WD game viewing vehicles carrying a maximum of six people per vehicle shall be used by the prospective concessionaire within the entire CH/12 (Table 8.1). This would give a CH/12 area-to-game drive vehicle ratio of maximum 161 km^2 per vehicle, which ensures minimal environmental impact.

(ii) No more than two game drive vehicles carrying a maximum of six people per vehicle shall be allowed at any of wildlife sighting zones in CH/12. This is expected to ensure low group encounter rates providing opportunity for tourists to experience a sense of solitude, tranquillity, and closeness to nature.

(iii) Low intensity off-road driving in CH/12 may only be permitted where it is necessary for game viewing (large carnivores or rare animals). However, it shall be a requirement of the Concession Management to closely monitor the impact and respond accordingly to the findings. The monitoring shall seek to understand the impact of off-road driving on the vegetation recovery rates and ground fauna. Subject to this monitoring, the concession Management should reassess the suitability of off-road driving in the concession area.

(iv) In order to ensure a minimum level of service professionalism, it shall be a requirement for the Concession Management to enforce or compile a "Code of Conduct for all professional guides in CH/12's camps or lodges". The code is expected to regulate off-road driving and ensure maintenance of low game drive densities and intimate and exclusive wildlife experiences. The operational planning that respects the wilderness requirements of all camps or lodges in CH/12 shall be critical to minimizing conflicts.

(v) Monitoring game drive impacts shall be necessary to ensure that thresholds that have been set for CH/12 are not producing any undesired effects. The aim is to stop any environmental problem before it reaches unacceptable levels The monitoring shall examine the amount, type, and location of visitor use as well as the number of encounters with other visitors together with their effects and threats to biodiversity in general and wildlife in particular..

(vi) No more than two service vehicles shall be permitted per camp or lodge site in CH/12. They must be registered and solely used for the supply of camps (one supply vehicle per campsite) and for the transport of visitor and staff from and to campsite (one dedicated transport vehicle per campsite). Potential service vehicle and game drive/visitor conflicts shall be minimized by either separating the game drive and service paths in CH/12 and/or by limiting service hours from and to campsites, when possible.

8.8 SUMMARY OF ACCOMMODATION AND GAME DRIVING CAPACITY THRESHOLDS

Table 8.1: Accommodation and Game Driving Capacity Thresholds for the Proposed New Camps or Lodges in CH/12

Camp/Lodge	No. of beds	No. of Game Drive Vehicles	Number of service vehicles(2)
Bottle Pan Camp or Lodge	24	4 (1)	2
False Nunga Pan Camp or Lodge	30	5 (1)	2
Total:	54	9	4

1. *4WD vehicles carrying a maximum of 6 people*
2. *Service vehicles refer to vehicles that are specifically used for: (A) Camp supply (1) ; and (B) transport of visitors and staff to and from the camp (1). A tractor and/or grader per camping ground for trails and other maintenance purposes shall also be allowed. The vehicle shall be registered and licensed by the Department of Road Transport and Safety.*

8.9 MOBILE CAMPGROUND FACILITIES IN CH/12

8.9.1 Besides remote lodging in CH/12, it is considered to be an opportunity for the prospective concessionaire to grow tourism by using mobile campground facilities. The aim is to open CH/12 for non-motorized tourism where walking safaris guided by well-trained practitioners and overnight camping in a number of mobile campgrounds can play important roles in unlocking the ecotourism potential of the concession area. Given the history of commercial hunting in CH/12, it would be prudent to allow sufficient time lapse before this product is introduced in the area since wild animals subjected to previous hunting regimes not only become elusive and evasive, but some can pose a serious risk to human life as an evolved behavioural anti-hunting defense mechanism. Although this kind of product requires minimum infrastructure, it requires qualified, well-trained, and competent guides, as well as dependable equipment and a well-designed product that offers a sense of adventure, as well as good interpretation of natural resources and values within CH/12. In addition, the character of this product will necessitate the provision of a number of wilderness camping grounds. In view of that, this Tourism Management Plan prescribes the following:

(i) Establishment of a walking safari area within each ecotourism management zone proposed in the concession area. Each area is expected to contain between three to four mobile campgrounds situated in such a way that visitor groups will be able to from one campground to the next in a day. The prospective concessionaire shall be authorised to identify areas suitable for walking safari within each ecotourism management zone.

(ii) Although Map 8.1 suggests the tentative locations of the mobile campgrounds for each ecotourism management zone in CH/12, it shall be responsibility of the prospective concessionaire to identify a workable network of the campgrounds micro-locations for each ecotourism management zones in CH/12, preferably with durable (less sensitive) vegetation cover. It is, in this regard, expected that the positioning of mobile campgrounds shall be peripheral to the sensitive areas and wildlife scenic vistas around natural and artificial water points;

(iii) In the Western Exclusive Wilderness Zone, the walking safari area is envisaged to be exclusively used by one walking safari group at any one time. To eliminate a potential source of environmental and visitor conflicts the group shall be limited to a maximum of 10 people. No large camping site shall be permitted in this zone (Table 8.2).

(iv) In the Eastern Low Density Semi-Wilderness Zone, the walking safari area is envisaged to allow more than one walking group per block. In this scenario, walking groups may move along a standard route, starting and finishing at the same specified points. Therefore, rather than having a maximum of one group per the walking safari area identified, there will be a maximum of one group per campground location. The group shall also be limited to a maximum of 10 people. No large camping sites shall be permitted in this zone, as well (Table 8.2)

(v) The prospective concessionaire shall be required to take responsibility for conducting its own tours, or identifying a mobile operator(s) who will be restricted to certain areas within the concession area and subject to a strict code of conduct that ensures visitor experiences expected for the area.

(vi) All mobile campgrounds in CH/12 are expected to satisfy standards for 'Wilderness Camping Ground' as stipulated in the draft 'Grading Standards for Camping Grounds in Botswana' (BTO, 2012- part 3). According to that draft, Wilderness Camping Ground refers to a remote un-serviced camping ground. It is a designated location in a wilderness or protected area with a GPS coordinate and a signpost at the ground as the only orientation and identification mark. Wilderness camping grounds do not usually consist of individual sites but are rather used exclusively by one group. In CH/12, all wilderness campgrounds shall have capacity to accommodate groups of maximum 10 people.

(vii) Optionally, in the eastern low density semi-wilderness zone the prospective concessionaire shall be permitted to upgrade mobile (wilderness) campground around Letota's Pan to minimum, '3-star Remote Camping Ground' containing ablution, and all other facilities as per requirements stipulated in the draft 'Grading Standards for Camping Grounds in Botswana' (BTO, 2012- part 1).

Table 8.2: CH/12 – Capacity Thresholds for Wilderness Campgrounds in CH/12

Operational Parameters limits	Western Exclusive Wilderness Zone	Eastern Low Density Semi-Wilderness Zone
Max. Number of wilderness camping grounds	3	4
Minimum distance between camping ground	7 km	7 km
Maximum Number of visitors per group	10	10
Maximum Number of groups per walking safari block	1	3
Maxim Number of visitor per safari block at the time	10	30
Maximum number of nights at any one campsite location	3	3

Environmental Considerations

8.9.2 With regard to environmental issues associated with walking safaris and related mobile wilderness campgrounds in CH/12 the following are prescribed:

(i) To enable guided short or long-day walking safaris, overnight wilderness camping and similar tourist activities that would be introduced in CH/12, it shall be the prospective concessionaire's responsibility to identify wilderness walking trail routes for each ecotourism management zone in the concession area and make recommendations on their design, construction and maintenance. These wilderness-walking trails are conceived to be non-delineated access routes with minimal user-defined path development. It shall be a management requirement to keep these trails to a minimum. Routes should be carefully selected to avoid fragile terrain and critical wildlife habitats. Rehabilitation on such routes will be to mitigate unacceptable resource damage only. Once an impacted section is

identified, appropriate clearances may be carried out. Off-trail walking by means of accessing relatively undisturbed places, should be discouraged as it increases potential for disturbance of sensitive wildlife that have sought refuge in remote habitats.

(ii) The wilderness campgrounds permitted in CH/12 shall require careful monitoring, as areas that can gain popularity, might suffer significant environmental impact. If necessary, active management measures shall be applied so as to minimise the adverse effects of recreational use on designated campgrounds throughout the concession area;

(iii) No permanent or semi-permanent tourism facilities, other than campgrounds and wilderness trails with essential linked infrastructure such as bridges (if required) shall be permitted within the proposed walking safari block.

(iv) Overnight bushwalker groups using remote areas are encouraged to bury faecal waste following recommendations and prescriptions stipulated in the section 10.1 of this Tourism Management Plan.

(v) The prospective concessionaire or authorised mobile operators operating in CH/12 are expected to follow Code of Conduct guiding the use of Wilderness Camping Ground. The Code is included in the draft Grading Standards For Camping Grounds In Botswana (BTO, 2012-part 3)

(vi) It shall also be a requirement for the prospective concessionaries to comply with all modifications of wilderness camping ground standards and code of conduct that may be proposed by the relevant authority (BTO).

Code of Conduct for Wilderness Camping Grounds

The following Code of Conduct shall guide the use of all Wilderness Camping Grounds (including Mobile Operator Camping grounds). The various organizations managing or operating Wilderness Camping Grounds i.e. DWNP, HATAB, BOGA, Communities and individual private sector companies may restrict the use of these Camping grounds further and introduce penalties for misconduct.

a) When in National Parks and Game Reserves, all DWNP rules and regulations must be strictly adhered to and the Wildlife Conservation and National Parks Act, 1992 and the Guidelines for working in National Parks and Game Reserves apply.

Attention is drawn to the following points outside protected areas:

b) No vegetation may be cut, marked or removed, unless cutting grass to clear a tent site;

c) Each ground comprises a certain area demarcated or open, and a camping ground sign shall demarcate the center of the site. The Camp must remain within a stipulated radius of this sign.

d) The camping ground must remain totally undeveloped.

e) Operators and guests must provide their own toilets where applicable which must be either chemical/water or long drops. (The dimensions of the hole for the long drop toilet must not exceed 30 cm^2 x 1.5metres deep.) The hole should be filled in with soil when it is 30 cm from full. There must be one toilet per eight persons in the camp. If staff members are not using the client toilets, a staff toilet must be provided.

f) Rubbish pits shall not be dug or litter discarded at the camping ground / site. All litter should be removed and the whole ground checked before departure. Litter may not be deposited in public camping ground litter bins. All fires shall be properly extinct and ashes must be buried.

g) Any camping ground / site user, who finds a camping ground / site in an unacceptable state on arrival should first clean it up and then submit a written report to the relevant reservations office for action.

h) Electronic music making equipment may not be used at the camping grounds / sites.

i) All tents should be as discreetly located from the game viewing roads as possible and be erected in such a way so as not to obstruct any existing game trails where in wildlife areas.

j) Other than the access track / road, no new Tracks / roads may be made.

k) No firewood may be collected within one kilometer of any camping ground outside protected areas and no firewood shall be collected within protected areas.

l) At any one camping site, the number of people (including staff) and vehicles must not exceed the camping ground operator's directive

8.10 ACCESS CONTROL TO CH/12

8.10.1 It is a widely held view that access control, especially over the use of natural resources in Wildlife Management Areas is a complex issue and inter-related to several factors crucial for supporting livelihoods of the concerned communities. A common phenomenon in many WMAs and related concession areas is dominance by the tourism business operators who have a tendency of marginalizing the local communities by denying them access to certain areas for fear of compromising the tourism experience. While regrettable, this is understandable on the part of the tourism business operators simply because some local community activities such as poaching and veldt products gathering compromise the tourism product if left unchecked.

8.10.2 There is a widespread agreement among stakeholders consulted that access control issues can potentially generate serious conflicts if poorly handled. A holistic approach is therefore required for the management of access that takes into account the prevention of damage to wilderness areas within the constraints of the new rights of responsible access. Such an approach is expected to help reduce existing negative impacts through encouraging responsible behavior by providing appropriate interpretation and advice about minimizing adverse impacts. The regulatory framework, i.e. Wildlife Management Areas Regulation of 2010, though still in the final draft form, tackles access control issues comprehensively and as such represent competent guidelines for regulating these issues in CH/12.

8.10.3 This Tourism Management Plan recognizes the need for establishing effective access control mechanisms in CH/12 which would ensure orderly and responsible behaviour. In this regard, the Plan prescribes the following:

(i) From the access management viewpoint, CH/12 shall be designated as an Exclusive Area, limited to concession holders that have specific use or development rights as defined in lease agreements. Consequently, no person shall be allowed to enter CH/12 for any commercial purposes without consent of the prospective concessionaire.

(ii) Exclusive access to the CH/12 also relates to community members who, for the purpose of natural resource consumption or any other commercial purpose, shall seek the concessionaire's consent, issued in agreement with the local Traditional Authority. With regard to this, it is considered essential for the prospective concessionaire to recognise community rights for natural resources utilisation and be informed by the relevant Central Government department (e.g. DFRR) and communities about the type and details of veld product use in CH/12. Similarly, communities need to be sensitised on the "exclusive access" status of CH/12, as well as on the operational character and preferences of ecotourism, in order to minimise potential for conflict. Map 8.1 delineates the grass-cutting zone in CH/12 beyond which possible conflict of natural resource extraction with eco-tourism may become prominent. It shall be the Concession Management task to compile and enforce a form of resource extraction agreement that should be reached between the prospective concessionaire and concerned communities. In addition to this, the Concession Management shall, in consultation with the relevant local tribal authorities, be expected to do the following:

- Define control mechanisms for subsistence use, in terms of who has the right to use natural resources and whether appropriate permits have been issued
- Monitor natural resource use and consumption in CH/12, and develop mechanisms for regular reviews and update stakeholders on possible changes.

8.10.4 Given the complexity of the harvesting of natural resources in general, and grass cutting issues in particular, the Code of Conduct for Grass Cutters in CH/12 is proposed in this Tourism Management Plan (see Annex A).

8.10.5 Experience in the field and research findings have also shown that people in many cases respond positively to requests to modify their actions or behaviour when they understand why they are being asked to do so. Many of the difficulties that have come to light stem from a lack of knowledge from either the natural resource user's or concessionaire's perspective. It is therefore, believed that besides more vigorous access control, increasing knowledge can aid the process of understanding and can encourage a more collaborative approach to resolving access problems.

8.10.6 How the respective interest groups, especially the prospective concessionaire and natural resources users, communicate and collaborate will partly determine the success of the access control in CH/12. In other words, although the Concession Management together with Chobe Land Board and other relevant Central Government departments (e.g. DFRR) have statutory duties towards the successful encouragement of responsible behaviour, it will however depend largely on those on the ground being prepared to work collaboratively to resolve issues. Effective communication has in this regard been identified by all stakeholders as the key to success.

8.11 PHYSICAL ACCESS TO TOURISM ZONES IN CH/12

Vehicle Access and the Trail System in CH/12

8.11.1 One of the key wilderness tourism features of CH/12 relate to the absence of constructed tarred or gravel roads. At present, regular road access to CH/12 is mainly possible through the existing firebreak line connecting the Nata - Kazungula (A-33) Road with the concession area. It is essentially a loose sand track requiring 4-WD vehicles all year round.

8.11.2 The lack of extensive and gazetted road access has positively contributed to the largely intact natural environment and exclusivity of the concession area. Accordingly, if CH/12 is to remain a true wilderness, the "Roadless" nature of the concession area must be maintained. In view of that, this Tourism Management Plan prescribes the following:

(i) Given that the Tourism Management Plan for CH/12 is to provide for exclusivity, vehicle use shall generally be permitted to:

- Concessionaires for exclusive, low intensity game driving and transporting visitors to and from camp or lodge sites;
- Researchers, where it is demonstrated that such vehicle use is necessary for undertaking approved research projects; and
- DWNP officers, law enforcement and any other person delegated with management responsibility of the concession area.

(ii) Members of the public shall not be allowed to access the concession area using motorized vehicles without the consent of the prospective concessionaire;

(iii) Existing trail system within CH/12 shall be maintained at current levels to allow motorized access. New trails shall only be considered where and when there are no alternatives.

(iv) It shall be the prospective concessionaire's responsibility to undertake the trail system evaluation in the concession area and identify needs for development of new game-drive trails or recommend their closure. This Tourism Management Plan recommends the game driving trails that are (or will be) developed in CH/12 should not exceed a ratio of 350 meters per square kilometre, which gives a total approximating 520 km. Map 8.1

illustrates the tentative game-drive trail system envisaged in CH/12. It forms a complete circuit totalling approximately 430 km. The proposed trail system follows the same route of the existing trails with a few additions of proposed trail branches for currently inaccessible sites. Equally important, they connect to the most interesting and attractive resources.

(v) Wilderness standard or wilderness trails shall be used as much as possible to minimize the impact of human use. In CH/12, carving of trails or construction of other structures to higher standards than necessary for wilderness purposes shall be prohibited. Exception will be the trail connecting the existing Bottle Pan airstrip to the new camp or lodge location proposed nearby the False Nunga Pan. Upgrading the almost 30 km trail to higher standards than necessary for wilderness purposes shall be allowed. This is expected to ensure comfortable (~35 to 40 minutes) transport of visitors between the new camp or lodge and the airstrip (Figure 8.2)

(vi) In addition to the above, the Concession Management is also expected to negotiate possibility of providing access road that would connect the Nata - Kazungula (A 33) primary national road to the proposed camp or lodge near False Nunga Pan. As illustrated in Figure 8.2 below, the ~15 km access road has been proposed. Essentially, it is sand firebreak traversing through Sibuyu Forest Reserve, and as such would require 4WD vehicle.

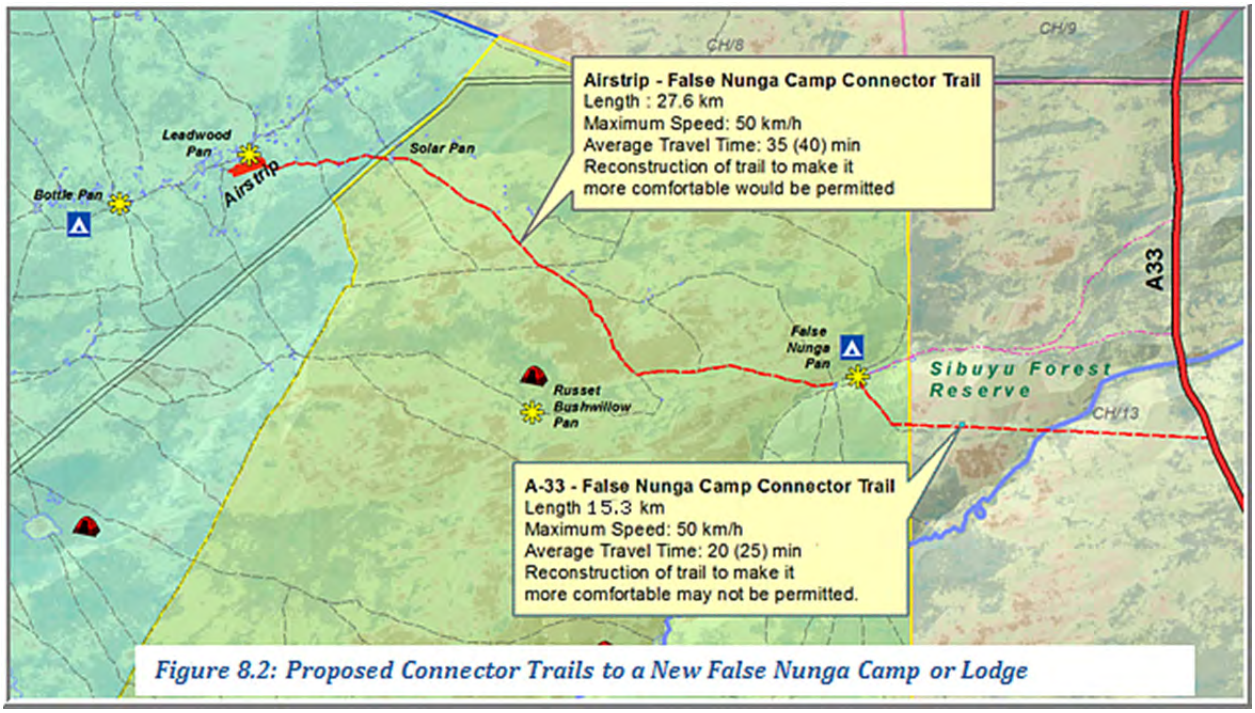


Figure 8.2: Proposed Connector Trails to a New False Nunga Camp or Lodge

(vii) The prospective concessionaires are also expected to keep trails and their utilisation from causing unacceptable wilderness degradation. Reconstruction of trails to make them easy or more comfortable shall be prohibited. Trails repair and maintenance shall strive to retain the wild qualities of the area by ensuring that paths have a less formal character. The cutting of each tree and the moving of each volume of soil must be justified as the minimum necessary to meet a wilderness stewardship objective. Wilderness trails shall lie lightly on the land. They should "fit" the landscape as a game trail does, respecting landforms and natural hazards.

(viii) Trails reconstruction, including relocation of short stretches for resource protection or safety, may be allowed on existing trails subject to approval by the relevant authority. Abandoned portions of trails shall be rehabilitated and naturalized.

(ix) It shall be a requirement for the concessionaire to restrict the use of sensitive trails in CH/12 during the wet season, rather than allowing vehicles to attempt to navigate through muddy terrain, and leave long-standing and unpleasant scars.

Air Access

8.11.3 With regard to aircraft operations and access management, the following is prescribed:

(i) No additional airstrip, except the existing one nearby Bottle Pan shall be allowed inside CH/12.

(ii) To preserve wilderness ambience and quiet enjoyment, the prospective concessionaire is expected to prepare and adopt a Code of Conduct in terms of development of specific operating procedures which may limit hours of aircraft use and access and impose other conditions.

(iii) No aircraft or helicopter scenic flight shall be permitted without the consent and management approval by the Concession Management;

(iv) If aircraft or helicopter scenic flight get introduced within the concession area or its immediate surroundings, it is also expected that the flight restriction buffer zones be promoted among air tour operators, parallel to the enforcement of the existing regulations (map 8.1) The result could be a consensus based on 'wilderness tourism and air access protocol' that reflects wilderness tourism interests in CH/12 and its surroundings;

Biodiversity Conservation and Management in CH/12

CHAPTER 9: BIODIVERSITY CONSERVATION AND MANAGEMENT

9.1 INTRODUCTION

9.1.1 The conservation and management of biodiversity as part of the proposed Tourism Management Plan for CH/12 draws inspiration and strategic direction from several relevant international conventions and protocols, notably the CBD, which Botswana ratified in 1977 (Table 3.1). At the national level, the proposed Plan is guided by the Botswana Biodiversity Strategy and Action Plan (BBSA; 2004). The CBD and the BBSA advocates for the Ecosystem Approach to management of biodiversity and conservation of natural resources, a widely accepted key strategy used in the management of dynamic ecosystems such as the semi-arid CH/12 savanna. While there is no single internationally agreed-upon ecosystem approach or definition thereof, the concept is generally understood to encompass the integrated management of human activities, based on the best understanding of the ecological interactions and processes, so as to ensure that ecosystems structure and functions are sustained for the benefit of present and future generations.

9.1.2 The CH/12 Scoping Report identified tourism development as a major potential threat to biodiversity, prompting the proposed Tourism Management Plan for the concession area to recommend effective biodiversity protection strategies. Other notable threats to biodiversity in CH/12 and the surrounding areas include; habitat loss, climate variability, invasive species, over exploitation of vegetation resources, illegal hunting, littering, and uncontrolled veld fires. In view of these threats and risks, the strategic directions to be employed in the management of CH/12 should recognize ecotourism business as a critical undertaking which should minimise pressure on biodiversity by managing and mitigating their impacts. To mitigate the impact of tourism development and other anthropogenic activities on biodiversity, the proposed Plan recommends six management strategies emanating from the twelve principles recommended by the Conference of Parties of the CBD (2000) to guide signatory countries in the practical application of the Ecosystem Approach, and are considered best practices. These management strategies are as follows:

(i) Integration of biodiversity in tourism business,
(ii) Adaptive management,
(iii) Co-management,
(iv) Biodiversity Inventory, Monitoring, and Research,
(v) Management of Endangered Species, and
(vi) Fire Management.

9.2 INTEGRATION OF BIODIVERSITY IN TOURISM DEVELOPMENT AND PLANNING

9.2.1 Integrating biodiversity into tourism development is a widely accepted strategy used to protect and conserve biodiversity in areas where biodiversity-dependent tourism businesses are practiced (Kalikawe, 2001; Shand, 2001). Botswana, as one of the countries which embrace this strategy, conducted a case study on integration of biodiversity into the tourism sector through the Department of Tourism (Kalikawe, 2001). The study expressed the economic value of biodiversity which is harnessed through eco-tourism business, thus justifying the business case for biodiversity. The study further recommended the inclusion of biodiversity conservation and management in the Botswana Tourism Master Plan. Since tourism enterprises in CH/12 are predominantly biodiversity-dependent, it is strongly recommended that the prospective concessionaire shall develop comprehensive Pro–Biodiversity Business (PBB) plans which include a strong business case for biodiversity conservation.

9.2.2 A Pro-Biodiversity Business (PBB) is a commercial enterprise dependent on biodiversity for generating its economic returns, and contributes to long-term sustainable biodiversity conservation and utilisation (Dickson et al. 2007). As such, the prospective concessionaire is expected to:

(i) Demonstrate in their business plans that they understand the risks posed by their business to loss of biodiversity and environmental degradation.

(ii) Systematically and periodically review their operations in relation to biodiversity and ecosystems services, and assess how direct and indirect drivers of change in ecosystems services affect their business.

9.2.3 Specifically, as part of their business plans, the prospective concessionaire will be expected to:

(i) Identify the impacts and dependencies of their business on biodiversity and ecosystem services

(ii) Assess business risks and opportunities associated with those impacts and dependencies

(iii) Develop biodiversity and ecosystem information systems,

(iv) Set SMART (Specific, Measurable, Attainable, Realistic, and Time-bound) targets, and measure and value performance

(v) Take action to avoid, minimize, and mitigate biodiversity and ecosystems services risks, including in-kind compensation.

(vi) Grasp emerging biodiversity and ecosystems services business opportunities such as cost effectiveness, new products, and new markets.

(vii) Integrate business strategy and actions on biodiversity and ecosystems services within a wider corporate social responsibility

(viii) Engage with business peers and stakeholders in Government, NGOs, academic and research institutions, and civil society to improve biodiversity and ecosystem services guidance and policy.

9.3 ADAPTIVE MANAGEMENT OF BIODIVERSITY IN CH/12

9.3.1 Adaptive management refers to a structured process of learning by doing, and adjusting management interventions based on what has been learned (Walters and Holling, 1990). It is based on the a recognition that resource systems are typically not well-understood, and there is value in tracking resource conditions and using what is learnt as resources are being managed. The Ecosystem Approach requires adaptive management to deal with complexities and dynamics of ecosystems in the absence of complete knowledge or understanding of their functioning. Currently, the ecosystem structure and functioning of CH/12 as part of the greater Northern Botswana Wildlife System, is still not well understood, due in part to its complexity, thus prompting an adaptive management approach.

9.3.2 The Scoping Report revealed that biodiversity in CH/12 is dynamic, changing through time and in response to changing environmental conditions and management actions. A typical example of a management action which influenced biodiversity in CH/12 over the past few years is the provision of artificial water points for wildlife. Except for the observed increase in resident wildlife populations since 2004 (DIES, 2012), the short and long term impact of artificial water points provisions on biodiversity of CH/12 remains largely undocumented and uncertain. The proposed Plan therefore places strong emphasis on Adaptive Management in order to respond to uncertainties that could emerge from management interventions such as provision of artificial water points.

9.3.3 The Plan subscribes to Keith *et al.* (2011)'s observation that successful adaptive management requires willingness to embrace uncertainty. The Scoping Report revealed that there are significant

uncertainties and lack of reliable information on some biodiversity components such as terrestrial invertebrates, amphibians, birds, and to a certain extent, large mammals. Further, the population dynamics and seasonal movements of large mammals are still scantily understood. With the projected changes in climatic conditions, the future of biodiversity in CH/12 and the surrounding areas remains uncertain with varied consequences for biodiversity management and tourism. The proposed plan noted that implementing adaptive management in relation to tourism and biodiversity requires cooperation of all stakeholders in tourism, and especially biodiversity managers and the tourism sector - an approach referred to as co –management.

9.4 CO-MANAGEMENT OF BIODIVERSITY

9.4.1 By definition, co-management is a management undertaking in which two or more social actors negotiate, define and guarantee amongst themselves, a fair sharing of the management functions, entitlements and responsibilities for a given territory, area, or a set of natural resources (Borrini-Feyerabend, 2000; Shand 2001). It is also referred to as participatory management, collective management, joint management, mixed management, multi-party, or round table management (Borrini-Feyeraben, 2000). The development of an adaptive management protocol and co-management for CH/12 was preceded by a comprehensive stakeholder analysis to identify the most relevant stakeholders.

9.4.2 The Scoping Report identified the following as key stakeholders in CH/12: community members of Pandamatenga and their various structures (the Tribal Administration, Community Trust, Village Development Committee), grass harvesters (from Chobe and other parts of Botswana), Tourism Companies (in particular the current concessionaire), Central Government Departments (DWNP, BDF, DFRR, DEA, DoT, Botswana Police), Local Government (Chobe District Council, Chobe Land Board), parastatal organizations (BTO), academic institutions (University of Botswana), NGO's (Elephant Without Borders, Kalahari Conservation Society, CARACAL), and independent researchers. The proposed plan strongly recommends co-management as one of the principal biodiversity protection strategies relevant for CH/12. To ensure that adaptive management and co-management are fully implemented, the plan proposes that the prospective concessionaire shall initiate and coordinate adaptive biodiversity management protocols.

9.5 BIODIVERSITY MONITORING IN CH/12

9.5.1 Status and trends in populations of animals can be achieved through undertaking consistent and dedicated monitoring and inventorying the numbers, condition, composition, population structure and the extent of other environmental factors that interact with the populations or specific species of interest.

9.5.2 With regard to the above, there shall be a requirement for the concessionaire in CH/12 to implement the "Protocol for the Monitoring of Fauna and Flora within Ngamiland, Botswana". The development of the protocol was financially supported by the Southern Africa Regional Environmental Program (SAREP) and was drawn in close collaboration with the Department of Wildlife and National Parks (DWNP) and Okavango Research Institute (ORI). The protocol has been characterized as cost effective, efficient, sustainable, and integrated with existing Management Oriented Monitoring System (MOMS).

9.5.3 As stated by DWNP the standardised wildlife monitoring protocol is designed to complement the MOMS approach (DWNP, 2013). It adds value to MOMS by prescribing in scientific terms the rigid approach to the monitoring of fauna and flora in concession areas. All these areas will be expected to use the methods soon, and by so doing the data collected will be comparable between concession

areas in northern Botswana and within the Kavango-Zambezi Transfrontier Conservation Area (KAZA-TFCA)..

9.5.4 According to the Protocol, there are two principal forms of monitoring activity, namely:

(i) Data that are collected continuously during the normal activities of the camps; and

(ii) Data that will be collected in the form of a bi-annual series of transects, between March and October by the concessionaires or communities, and is expected to provide insights on the demographic dynamics of wildlife populations, including carnivores.

Data to be Collected Continuously

9.5.5 It is objective of the continuous data collection to standardize and structure information that is currently collected by camps in CH/12 with their sightings book. Most guides already record information on predator sightings, kills, observations of rare and endangered species as well as rainfall and flood patterns etc. The standardized wildlife monitoring protocol aims to collate these data in a manner that can help with the management of the northern Botswana's wildlife populations as a whole. Professional guides and community escort guides will be able to benefit from everyone else's observations, and this will further help the guides to build a better picture of wildlife movements, immigrations and emigrations from their concessions. For example, the guides may know where their lion prides go when they leave the concession, or how diverse or similar prey selection is across areas. By sharing these data concessions will benefit as they will have a regional perspective of wildlife movements and occurrences within and beyond the concession boundaries.

Bi-Annual Data Collection

9.5.6 The objective for the structured transects is to collect ground observation data on aspects of wildlife populations that cannot be adequately obtained through aerial surveys. Information on population dynamics of herbivore species can provide insights on the status, health and viability of that population, and possible causes of wildlife decline. These data will augment the continuous sightings and events data that are already collected by guides in CH/12, and assist in providing a reliable and effective monitoring approach in order to answer the many questions surrounding the reduction of many species of wildlife in Botswana.

9.5.7 It must be understood that the information collected on a continuous basis and those collected during the bi-annual surveys are an invaluable source of information, not only to environmental managers and decision-makers, but also to the guides that are collecting this information. The information collected reflects, in a reliable manner, the circumstances locally and regionally. It allows guides to follow precisely the movements and habits of individual key herbivore and predator species and give tourists an experience that they would like to re-live.

9.5.8 As already indicated, it shall be the responsibility of the prospective concessionaire in CH/12 to implement the aforementioned protocol at the concession level. The following monitoring data are prioritized by the Protocol:

Table 9.1: Monitoring activities to be carried out in CH/12 by concessionaire

Wildlife Monitoring Activity	Methodology	Data Entry Sheets
Rainfall (rain gauge)	Continuous daily data collection by camp manager, monthly compilation onto web-based database	flood levels
Predator monthly summary (basic assessment of prides etc.)	Continuous daily data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	predation off-takes
Bird nesting sites (key species - birdlife priorities) (GPS or grid)	Continuous daily data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	event book sheet
Wildlife Pop Trends (ground transects)	Bi-annual survey (October & March)	*ground transects*
Poaching Incident reports (simple reports - not patrols)	Continuous data collection by guides, monthly compilation onto web-based database	event book sheet
Predation off-takes / selection (sightings of kills etc.)	Continuous daily data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	predator monthly summary
Presence of invasive and exotics	Continuous data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	event book sheet
HWC reports	Continuous data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	event book sheet
Fire Occurrence (fire scars / presence / location - simple records)	Continuous data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	event book sheet
Static Photo records (woody vegetation)	Bi-annual survey (October & March)	*ground transects*
Wildlife Population Structure (herbivore sex ratios & yearling rec.)	Bi-annual survey (October & March)	*ground transects*
Unusual events (rare sightings)	Continuous daily data collection by guides, monthly compilation onto web-based database by camp manager or senior guide	event book sheet

Source: Protocol for the Monitoring Of Fauna and Flora within Ngamiland, Botswana, SAREP, 2013

9.6 CONTROL OVER ILLEGAL USE OF NATURAL RESOURCES - ANTI-POACHING

9.6.1 The Scoping Report highlighted that the illegal utilisation of CH/12's natural resources has been rather low, but still remains a latent threat. Because of the conservation and economic value of wildlife populations in CH/12 and the growing threat of poaching within the wider region of northern Botswana, this Tourism Management Plan motivates for enhancing existing anti-poaching vigilance structures and programmes. The Plan, therefore proposes the establishment of an anti-poaching team to conduct regular patrols in the concession area. Members of the anti-poaching team shall be drawn from the escort guides of all the lodges and camps that will operate in CH/12.

9.6.2 The proposed anti-poaching team will be expected to conduct regular patrols and surveillance trips to monitor illegal hunting activities within the concession area, especially during the grass harvesting season. The team should ideally comprise; the environmental officer, three senior guides serving as patrol leaders, three junior guides, and four community members.

9.6.3 Given the danger posed by poachers, the team shall specifically focus on identifying indicators of poaching such as dead animals, unknown car trails, unknown foot marks and gunshot sound within the concession and surrounding areas. Upon suspicion of any poaching activities the team will alert the DWNP and BDF for further investigation.

9.6.4 Periodically, DWNP and BDF shall assist the anti-poaching team with relevant training. A minimum of one intensive patrol, involving a full team shall be conducted every month. After every patrol, the team leader (reporter) shall produce a comprehensive report to be submitted to the concession manager, who will review it, summarize it and report to the Anti-Poaching Unit of the DWNP.

9.6.5 The anti-poaching patrol team-leader (Reporter) is expected to be provided with the following items before the patrol starts:

(i) Instructions for writing the report
(ii) Note book
(iii) Measuring tape
(iv) GPS –instrument, and
(v) Camera

9.6.6 The team-leader (Reporter) will be required to take notes of all matters of interest during the patrol including route taken, animal sightings, animal behavior (vigilance, reaction to human presence, etc.). The following information are expected to be recorded:

(i) Date of the patrol;
(ii) General area patrolled;
(iii) Names of patrol members and their designations;
(iv) Name of report writer;
(v) Signs and GPS location of illegal activities to be recorded during the patrol
(vi) Date when the illegal activity took place. For example, if footprints are seen during the patrol, the observer is expected to estimate how old they are in days;
(vii) Dead or wounded animals sighted during the patrols;
(viii) The number, type and GPS position of snares and traps found during the patrols;
(ix) Poaching camps sighted;
(x) Grass harvesting camps located during the patrol.

9.6.7 This Plan also recognizes that anti-poaching patrols are high risk and dangerous, and it is therefore critical that the anti-poaching team members in the concession area be properly equipped to maximise their safety and their effectiveness. In addition, the equipment is expected to be maintained to acceptable standards.

9.6.8 Furthermore, this Plan strongly recommends establishment of an effective cooperation between the concession management and traditional leaders in raising local community awareness through a pro-active education campaign amongst surrounding communities. Soliciting the cooperation and support of local communities is envisaged as a vital preemptive approach that the concession management (including DWNP) should adopt in tackling the threat of poaching. By forming better relationships with the local communities, it is hoped that progress can be made to change the attitudes that lead to poaching practices. This action will concentrate on building awareness amongst the neighboring communities of the national and regional conservation importance of CH/12 and surrounding resources and establishing a sense of ownership for their conservation. This will principally be achieved by strengthening the relationship and trust with the traditional leadership and representation, and encouraging them to instill discipline and responsibility of community members towards conservation of resources in the concession area.

9.6.9 This Plan also recommends that the concession management should seek to increase the spatial extent and effectiveness of anti-poaching operations by improving collaboration with neighboring areas on-site management structure. In this regard, joint anti-poaching patrols may be undertaken whenever necessary, depending on the magnitude of the problem.

9.7 FIRE MANAGEMENT IN CH/12

9.7.1 The Scoping Report revealed that veld fires are a common phenomenon in CH/12, despite the government of Botswana's current policy which prohibits the use of fire as a management tool without permission from the relevant authorities. Thus far the major fire management strategy in CH/12 and the surrounding areas has been the control of the spread of fire through fire breaks and fire extinguishing teams. However, the fire breaks which are maintained by the Department of Forestry and Range Resources (DFRR) have proven to be largely ineffective. As per the Scoping Report, little success has been realized since much of the concession area vegetation burns almost every year.

9.7.2 The Scoping Report has highlighted the fact that veld fires play an important role in influencing the ecology of CH/12's dry land savanna ecosystem and its rangeland conditions. Therefore, impeding natural veld fires processes does not necessarily ensure protection of the ecological values of the concession area. On the other hand, the Scoping Report has also noted that fires are illegally used by grass harvesters as a management tool in CH/12 and under the present conditions of open access, large areas of CH/12 and its surroundings burn almost every year. Consequently, uncontrolled (human-induced) veld fires in CH/12 remains a major concern, as they are also a major potential threat to CH/12's biodiversity and resilience.

9.7.3 This Tourism Management Plan recognizes veld fires as an important management tool that can be used to enhance the tourism product. With regard to this, the following is prescribed:

(i) More control over veld fires and their frequency in CH/12 is required to maintain and protect ecological values and ecotourism potential of CH/12. In the absence of a proper veld fire monitoring and research program, it is strongly recommended that frequency and intensity of veld fires in CH/12 must be reduced by means of allowing natural fire regimes to occur naturally on the landscape, while, at the same time supressing uncontrolled (human-induced) veld fires. To fulfil these requirements, it is expected from the Department

of Forestry and Range Resources (DFRR) to embark on organisation of environmental awareness programmes to sensitize the communities about the ecological and economic importance of veld fires. This approach is likely to help manage and prevent the occurrence of uncontrolled (human-induced) veld fires in CH/12. In addition, the prospective concessionaire is also expected to work with communities not only with creating employment but also with educating the public and designing methods of controlled natural resource access in CH/12. Finally, community engagement and support in the development, implementation and review of fire management strategies should also be sought to ensure that local knowledge, values and resources are effectively utilised and to raise awareness, understanding and appreciation of fire management issues throughout the community;

(ii) Since CH/12 burns every year with poorly known implications on biodiversity, the Plan does not recommend any prescribed burning given the fact that fuel load dynamics in CH/12 are largely unknown at present.

(iii) Although the Plan does not recommend prescribed burning in CH/12 at the moment, it recommends adaptive management of veld fire depending on the availability of new information in future.

(iv) The adaptive management of veld fires will require a systematic effort to acquire information from management experience, as well as monitoring and research. The aim is to provide knowledge that enables the Concession Management to adapt fire management strategies based on a progressive increase in knowledge about fire behaviour and ecological response to fire in the concession area. It is, in this regard recommended that systematic monitoring of veld fires and post-fire recovery in CH/12 should be initiated to improve understanding of the fire ecology in the concession area. This monitoring and research program is expected to take into account the following:

- Ecosystem response to fire (including vegetation recovery, soil stability, biodiversity quality);
- Impacts of natural and human induced fires on the concession's area forage quality;
- Effects of fire on woodland ecosystems;
- The response of weeds and invasive species to fire;
- Fuel load dynamics, including the relationship between fire fuel properties and fire behaviour
- The effectiveness of hazard reduction strategies;
- Mapping fire history for both prescribed and unplanned fires;

(v) Should available information in future necessitate prescribed burning in CH/12, such burning should only be carried out under the following ecologically acceptable conditions:

- When the grass swards are moribund and/or unpalatable conditions as a means of restoring the vigour of the grass sward and allowing the nutritious re-growth to occur. This condition occurs when the standing crop of grass is ≥ 4000 kg/ha (Trollope 2006);
- If the grass sward is in a climax and/or sub-climax stage dominated by Decreaser and/or Increaser I grass species as a means of maintaining the potential of the grass sward to produce grazing for both livestock and wildlife (Trollope , 1999);
- When the grass sward is in a pioneer condition dominated by Increaser II grass species in order to allow it to develop to a more productive stage dominated by Decreaser grass species (Trollope, 1999).

(vi) In addition to the above, it is suggested that only cool fires that would only affect the sward layer may be allowed (Trollope 2006). This imply the need to implement an early winter

rotational burning programme that would reduce fuel loads whilst avoiding irreversible damage and stimulating species diversity.

(vii) It is also suggested that post-fire clean-up should be minimal (other than for safety hazards) in order allow decomposition to return nutrients to the ecosystem, and allow natural regeneration. In other words, given the nature of CH/12 natural regeneration and restoration is preferable to human interference.

9.7.4 This Tourism Management Plan also recognizes fire as a threat to lodges and other tourism developments in CH/12. It is important to note that several lodges were burnt to ashes in some parts Botswana (e.g. Chitabe Lodge in NG/31 and Nata Lodge in the Central District are some of the lodges which were burnt to ashes in recent years). The Plan recommends the following for fire management:

(i) A fire management team for the concession area shall be established. The team shall consist of escort guides from all lodges and camps in CH/12. The fire management team shall be responsible for fire suppression in CH/12.

(ii) Only natural and burnt firebreaks shall be used to control the spread of fire because firebreaks such as cut lines fragment habitats and are an eyesore to tourists.

(iii) All natural fires shall be allowed to burn as long as they do not threaten tourism facilities in the concession.

(iv) Fire prevention campaigns shall be conducted by the fire management team under the coordination of the Environmental Management Officer

(v) All the lodges shall have a trained fire-fighting team equipped with the following equipment

Firefighting clothes

- Yellow long sleeve shirts and blue trousers all made up of 100% cotton with reflectors and identification or name label
- Leather boots - 100% leather with no steel, rubber, and plastic inclusion
- Helmet and visor
- Leather gloves with rubber or plastic
- 1 liter water and web belt

Firefighting equipment

- 20 fire beaters to extinguish fires
- 10 back-pack pumps to pump water up to max 20 litres
- 5 drip torches to start fires for back burning
- 5 hand-held radio transceivers
- First aid kit provided to each fire fighting team
- Hand held weather device to measure wind speed and temperature
- Fire fix wetter, a wetting agent applied to water used by fire fighting teams (Anion acryl amide co-polymer dispersed in a light mineral oil 500gm/L)
- Vehicle slip-on fire-fighting units (750-1000l), which is transported on the back of a pick-ups, with ability to draw water from rivers and pans

9.8 STRATEGY FOR MANAGING ARTIFICIAL WATER POINTS IN CH/12

9.8.1 Artificial water point provision has been a major management intervention in CH/12 since 2004. Received wisdom suggests that water provision has resulted in an increase in some wildlife populations in CH/12. However, the long-term impacts of providing artificial water points in CH/12 are still poorly understood, and are yet to be put under keen ecological scrutiny. At the moment, it is extremely difficult, if not impossible, to reliably extricate or isolate the actual impacts of artificial water points on CH/12 biodiversity without the requisite cause-effect protocols and analysis in place, other than to invoke some candidate or potential impacts derived from studies elsewhere.

9.8.2 The Scoping Report indeed indicated that elsewhere, artificial water points have yielded both positive and negative results such as increased populations of water-dependent species like buffalo and elephant, decline in rare species like roan and sable antelope, loss of spatial heterogeneity, and the "piosphere effect" form of range degradation. To isolate the negative and positive impacts of artificial water points, it would require comprehensive long-term monitoring and research. This Tourism Management Plan recommends invoking the Adaptive Management approach to the provision of artificial water points, supported by short- and long-term monitoring data. It is, therefore recommended that the prospective concessionaire should monitor and document the impacts of artificial water points on biodiversity components.

9.8.3 CH/12 is situated in the middle of an extensive outlay of artificial water points within the Northern Botswana Wildlife System, both within and without protected areas. With the conversion of concession areas abutting protected areas from consumptive tourism use to non-consumptive (photographic) tourism use, these artificial water points are likely to become even more significant for ecological and ecotourism purposes. As such, concerted and organized efforts must be instituted to review and coordinate waterhole operational relativities, such that there is some mimicking of natural ecosystem functioning to relieve pressure on relatively heavily impacted areas. As such, the impacts of artificial water points in CH/12 should not be monitored and studied in isolation. The CH/12 concessionaire shall collaborate with neighboring concessionaires where artificial water points have been provided such as CT1, CT2, CT3 and NG/42 to establish a common, region-wide framework for artificial waterhole management. The Scoping Report revealed that 91% of the concession lies within 12 km away from a water point. This suggests that water points in CH/12 are strategically placed with an average nearest neighborhood distance of 9 km. With the current relatively low herbivore densities, the concession is expected to maintain the desired spatial heterogeneity.

9.8.4 This Tourism Management Plan prescribes that the prospective concessionaire shall maintain all the existing artificial water points (AWP). Based on new information that will emerge from monitoring and research to guide management, the concessionaire or Concession Management shall, on the basis of evidence, adjust or modify the management of artificial water points, giving them leverage to close or develop new water points.

9.8.5 The prospective concessionaire is also expected to replace the existing diesel-generator-based borehole pumps with more eco-friendly solar powered solution given the need to reduce operational costs, as well as oil and noise pollution around artificial water points.

9.8.6 This Plan furthermore prescribes that all AWPs should be carefully managed in accordance with Limits of Acceptable Change (LAC). Since the environment in CH/12 is similar to that of some parts of Chobe National Park, which also has artificial water points, it is considered appropriate to adopt LAC guidelines defined by the Chobe National Park Management Plan.

The following are recommendations for AWPs which are expected to be respected by the prospective concessionaire in CH/12:

(i) If there is a 40% reduction in the number of trees between a) 2m and 5m tall, or b) over 5m tall and between 3-5km from any of the artificial waterholes compared with baseline data – switch off pump for 2 dry seasons.

(ii) If there is a 20% reduction in the number of trees between a) 2m and 5m or b) over 5m tall and between 5km - 7km from the waterholes compared with baseline data – switch off pump for 2 dry seasons.

(iii) If bush encroachment between 100 m to 500 m from the waterhole exceeds twice that of the baseline data – switch off pump for 2 dry seasons.

(iv) If elephants at a waterhole on any day between September and November exceed the estimated number that the yield of the borehole can provide (each elephant requires 200 liters per day) - switch off pump and establish a monthly rotation strategy between boreholes.

(v) If there are three reports of elephants damaging infrastructure in a year - switch off pump and establish a monthly rotation strategy between boreholes.

9.8.7 As already indicated, it will also be a requirement for the Concession Management to put in place a long-term systematic monitoring and research program to better understand the negative and positive impacts of artificial water points in the concession area. To increase knowledge about how AWPs affect natural systems, the following questions should be the base of systematic monitoring programs:

(i) What are the patterns of wildlife abundance at the waterholes?

(ii) What are the rates of water loss at the waterholes?

(iii) How much water do the animals consume per day?

(iv) What are the patterns of soil physical and chemical changes at the water points?

(v) What are the patterns of water quality changes at the water points?

(vi) What are the patterns of biodiversity changes at the water points?

(vii) What are the patterns of animal interactions at the waterholes?

(viii) What benefits accrue to animals visiting waterholes?

(ix) What are the impacts of elephant utilisation on habitats around water holes?

9.9 DECOMMISSIONING OF ARTIFICIAL WATER POINTS IN CH/12

9.9.1 Management of artificial water points includes opening and closing of water points to manage the distribution of wildlife and to rehabilitate degraded areas within the vicinity of artificial water points. While this Plan commends that all artificial water points in CH/12 be kept running for a foreseeable future, it also prescribes that the prospective concessionaire should consider closing some water holes in future should the need arise. There are a number of issues that should be taken into consideration in the planning and implementation of a program of artificial water point closure to reconstruct or rehabilitate degraded areas around water points in CH/12:

Communications

9.9.2 It is essential that neighboring DWNP stations, concessionaire, and camp and lodge on-site managers are aware of any program of closure of artificial water points in the concession area as it

has implications for the management of adjacent populations and transient / itinerant/ migratory animals, particularly when they may have had access to such water sources heretofore.

Animals dependent on artificial water points

9.9.3 During an artificial water point closure operation, it is important to consider the welfare of animals to be affected and take appropriate steps to ensure that all animals are treated in a manner where their welfare requirements are met. This commitment is met through specific considerations nominated hereunder. In some circumstances, some species such as impala may have increased above natural carrying capacity due to the presence of surface waters, and inadequate control. If there are large populations in the vicinity of artificial water points that are proposed for closure, a controlled translocation or removal program by DWNP and other stakeholders, should be implemented.

Timing of closure to minimize animal suffering

9.9.4 The best time to close artificial water points while minimising the impact on habituated animals across an area is when there is ready access to surface water across the landscape following extensive seasonal rainfall events. A staged implementation of closures across several water points or concession areas is a manageable and practical approach to balance natural ecosystem recovery with the needs of animals that have become locally dependent on artificial waters.

9.9.5 It is also possible to undertake closure of artificial water points (individually, sequentially, or simultaneously) at other times (i.e. when there is no abundant surface water), but this should only be undertaken if the human and logistical resources are available to constantly monitor and deal with water-dependent animals in the vicinity of the closed water point(s).

9.9.6 Waterholes can be closed when they contain water, or when they have dried out. Waterholes can also be prevented from refilling through the closure of inlet streams or depressions and removal of banks. Earthworks associated with artificial waterhole closure can also be undertaken either during the dry season or the wet season depending on local environmental conditions.

Transient and Itinerant animals

9.9.7 Transient animals in the concession area can be an issue once water points have been closed. Such animals may return to areas they have previously used under the previous artificial watering regime. This can become a problem during drought periods if animals persist in the vicinity of old artificial water points and become too weak to leave. This is most likely associated with the lack of food, but prolonged periods of exceptionally high temperatures typical of CH/12 can have significant impacts on a variety of surface water-dependent animals. In such cases removal or staged channeling of animals to alternative water sources may be required to avoid unacceptable levels of animal suffering. To prevent animals persisting around such infrastructure and becoming trapped in drying waters, access to the water should be prevented by fencing, while there are alternative supplies across the landscape or in other known locations. If animals persist they could be physically captured and translocated.

9.10 GUIDELINES FOR THE CLOSURE OF ARTIFICIAL WATER POINTS FOR RECOVERY OF THE NATURAL ENVIRONMENT

9.10.1 Provision of artificial water points is an ecological intervention that must be managed adaptively. Closure of artificial waterholes simulates drought conditions, and is much an animal welfare issue as it is an ecological one. The outlay of artificial water points across the semi-arid CH/12 has facilitated year-round rangeland utilization which has fundamentally altered the essential spatial heterogeneous character of the landscape and the biodiversity. Artificial water points may contribute to significant deterioration of the rangeland as a result of sustained and persistent herbivory which may cause loss of palatable plant cover and diversity, trampling by wildlife and associated impacts on soil, decreased water infiltration and increased runoff. To allow recovery of the natural environment around artificial waterholes, herbivore pressure might have to be significantly reduced. A key strategy to achieve a reduction in total herbivore pressure across the landscape is to close selected artificial water points.

9.10.2 Although artificial water points may be closed to promote recovery of the natural environment through management of herbivory, Concession Management must minimise and effectively manage the impacts of closure on water-dependent species, to minimize animal suffering. Operational specifications for the closure of artificial water points are listed below:

(i) Any consideration of closure of waters must take into account: a) the prevailing seasonal conditions with regard to available rangeland conditions and surface water, b) animal abundance, and c) the likelihood of dependent animals locating alternative water supplies. Closure should only be carried out if all three factors do not indicate an unacceptable risk to animal survival and welfare.

(ii) The prospective concessionaire will prepare a strategic water plan, which will identify those artificial water points that needs to be closed and those that will be retained for domestic water supply, veld fire control, and other utility purposes.

(iii) An estimate of the resident populations in CH/12 has to be conducted. This may require aerial surveys in addition to standard ground surveys.

(iv) If animal numbers, particularly elephants are high and likely to impact on the regeneration of native vegetation, some program of translocation or removal may be required.

(v) A plan for the staged decommissioning of artificial water points will be prepared based on the strategic water plan.

(vi) The concessionaire will also assess the cultural heritage value of water points in considering any proposals for closure/decommissioning of artificial water points, e.g. the colonial cattle borehole (Bottle Pan) must not be closed for historical reasons.

(vii) All adjoining national parks (DWNP camps or stations), concession areas, camps and lodges will be advised in writing of the intention to close certain water points. Verbal contact should be made to confirm receipt of the advice and to determine whether neighbouring stakeholders wish to be involved in any of the proposed activities.

(viii) Closure of artificial water points will normally be timed to occur when there is abundant surface water in the landscape. Alternatively, if resources are available to provide constant monitoring of closed water points, closure can be considered during periods of minimal surface water availability, given that all other requirements have been met.

(ix) A program of scheduled visits to selected artificial water points will be implemented to monitor the wildlife that may be at risk as the landscape dries

(x) The process of artificial water point closure can include the decommissioning of boreholes, which will be removed following standard artificial water point shutdown protocols set out in the foregoing paragraphs.

(xi) Open boreholes will be covered to prevent any risk to staff, visitors, and wildlife.

(xii) A record of all wildlife trapped will be maintained by the prospective concessionaire

9.11 MANAGEMENT OF ENDANGERED SPECIES

9.11.1 The Scoping Report revealed that a number of globally-threatened species are found in CH/12, thus calling for management attention. The Wild dog is the only endangered mammal species found in the CH/12, although prospects of locating black rhino and white rhino exists in the area. Wild dogs only persist in areas with low human population densities. The human population density in CH/12 is low enough to enable survival of wild dogs. Since there is no livestock in CH/12, there is no possibility of human-wild dog conflict. There are therefore no management concerns for wild dogs worth of any interventions in CH/12 at the moment. However, it is critical to monitor wild dog populations and movements in the concession areas. It is also important to monitor the disease situation in of CH/12. Vulnerable carnivores include the African lion, black footed cat, and cheetah which also do not experience any major challenges from humanity except for potential competition for resources due to poaching. Elephants though considered vulnerable, are not subjected to any major pressures in CH/12. The proposed Management Plan therefore recommends the following management activities for endangered and threatened mammals in the CH/12:

(i) Populations of all endangered mammals species in CH/12 shall be monitored by the Environmental Officers of the concession area

(ii) Sightings of endangered species shall be recorded during game drives, walking safaris and patrols

(iii) No human settlements shall be allowed in the concession area

(iv) Wildlife disease surveillance shall be conducted by the DWNP and Department of Veterinary Services.

(v) An analysis of the genetic structure of all endangered species

9.12 INVASIVE ALIEN PLANT CONTROL

9.12.1 The Scoping report revealed that there are very few (if any) locations in CH/12 where native vegetation is in the process of being wholly or partially replaced by invasive alien plants (IAS). Therefore, it can be said that currently, alien plants pose no risks which may potentially result in a significant loss of the CH/12's environmental values. Nevertheless, this Tourism Management Plan suggests that the problem of IAS should, be tackled comprehensively by implementing consistent measures to reduce the risk of introduction of alien plants, pests and diseases in the concession area. With regard to this, it will be policy to forbid the introduction of alien plants to CH/12 including gardens of staff housing and tourist facilities and lodges. It is furthermore expected that the Concession Management will take part in a coordinated, regional approach to IAS management.

10

Guidelines, Regulations, and Strategies for the Management of CH/12

CHAPTER 10: GUIDELINES, REGULATIONS, AND STRATEGIES FOR THE MANAGEMENT OF CH/12

10.1 WASTE MANAGEMENT IN CH/12

Liquid Waste Management

10.1.1 Liquid Waste or wastewater refers to waste generated from ablution blocks (toilets and showers) and from kitchens. The Scoping Report revealed that the septic tank with soak-away is the dominant method of wastewater treatment used by the existing Bottle Pan Camp within CH/12. The report furthermore highlighted that the wastewater problem in the concession is at present not serious, but there will be a requirement to replace the septic tank with other wastewater management solutions in order to minimize future sanitation concerns. This requirement is stipulated in Botswana's Policy for Wastewater and Sanitation Management of 2001 which recommends that wastewater/sanitation technologies should be selected taking account of groundwater vulnerability. The policy notes that if the groundwater vulnerability level is high and in premises with an individual water connection, the recommended technology is: a) waterborne sewers plus wastewater treatment, b) septic tanks plus waste water treatment. Where the groundwater vulnerability is low, the recommended technology is: a) waterborne sewers plus waste water treatment; and b) Septic tanks. The policy further notes "the GOB wishes to stress that in areas where contamination of groundwater would have serious consequences on drinking water supplies, the use of unsealed pit latrines or of septic tanks with soakage systems will not be allowed" (Ministry of Local Government 2001: Page 22).

10.1.2 Although the groundwater level at CH/12 has not been amply explored, the assumption is that it is likely to be high due to proximity of CH/12 to the Chobe-Linyanti-Zambezi River systems. This Tourism Management Plan, therefore, recommends that design and construction of new camps or loges permitted in CH/12 should not include use of septic tanks, but sealed conservancy tanks with treatment facilities/methods to ensure that care is taken to minimize the risk of microbial and nitrate pollution that can result if effluent enters directly into the pans and/or groundwater. The use of conservancy tanks places emphasis on its design and operation, i.e. it should be used for the reception and temporary retention of sewerage and will require routine emptying at intervals. As such, the conservancy tank system at CH/12 should be waterproof and be fitted with proper inlet and outlet devices. Fat traps should be installed to capture grease and fatty substances from wastewater generated in lodges and camps kitchens. The objective of removing fats is mainly to improve efficiency of wastewater treatment facilities. Conservancy tank should be located on a place which is easily accessible to extractor vehicle.

10.1.3 Alternatively, the above ground, mini activated sludge treatment plant can be used by accommodation facilities permitted in CH/12. This and similar technologies are marketed as pre-engineered packages. They are being used worldwide for small establishments and have the ability to treat 10-400 m^3/day (Qasim 1999). The technology is adaptable and enables the developer to start small and increase treatment capacity when the need arises. They could be designed as chemical or biological plants capable to achieve a high BOD removal rate. The technology requires continuous energy input to provide aeration to the microorganisms that decompose organic matter. In addition, it requires continuous flow of influent to provide food to the micro-organisms that decompose organic matter. Failure to provide aeration and continuous flow of influent may

make the process ineffective. As a photographic tourism operation, the assumption is that tourism facilities in CH/12 will always have workers and guests for the system to run.

10.1.4 This Plan also prescribes that the siting of any collective wastewater treatment facilities should comply with the requirements of the Public Health Act, as well as the Protection Zones and Guidelines for Major Wellfields, Aquifers and Dams in Botswana. In this regard, a minimum radius of 100 m should be maintained around any borehole to avoid the risk of pollution from organic and inorganic sources.

10.1.5 A water quality monitoring of the boreholes shall be established and samples taken at regular intervals. The parameters to be analysed include Biological Oxygen Demand (BOD), Chemical Oxygen Demand (COD), Total Suspended Solids (TDS), Total Phosphorus and Nitrogen. This is expected to provide early warning of contamination problems and enable time for effective remedial action to be mobilized.

10.1.6 With regard to wilderness camping grounds, this Plan prescribes that sanitation solutions should follow the Code of Conduct guiding the use of Wilderness Camping Ground. The Code is included in the draft Grading Standards for Camping Grounds in Botswana (BTO, 2012- part 3). Long drop holes are, in this regard, recommended for CH/12, as they are still the most dominant method of black water disposal by mobile safari operators. For example, the dimensions of the hole as per standard practice and guidelines should not exceed 30 cm^2 by 1.5 m deep. The hole should be filled with soil when it is 30 cm from full. The following best practices are prescribed and should apply in addition to the Code of Conduct guiding the use of Wilderness Camping Ground. These include:

(i) Operators shall ensure that the holes are dug on organic soil;

(ii) Locating long drop holes at least 60 m from any surface or groundwater sources to avoid microbial contamination; and

(iii) Avoiding concentration of long drop holes around campsites

10.1.7 Although the long drop holes are an acceptable practice for remote and low tourist density areas like CH/12 or for non-water based tourism areas, it is usually important that organic soil is used for decomposition to be faster. In addition to long drop-hole toilets, chemical toilets are used, usually on demand by clients. As a result, chemical toilets are also prescribed for mobile safari operators.

10.1.8 It shall also be a requirement for the prospective concessionaries to comply with all future modifications of sanitation standards for wilderness camping ground that may be proposed by the relevant authority (BTO).

Solid Waste Management

10.1.9 This Tourism Management Plan strives to ensure the effective management of solid waste in CH/12 through compliance with the Waste Management Strategy of Botswana (2006) which adopts a Waste Management Hierarchy as the guiding principle. Among the key components of the hierarchy are: reduction of waste, reuse of waste recycling of waste and final disposal. With regard to this, the Plan prescribes the following:

(i) Waste production at all sources in the concession area shall be minimised, while recycling should be encouraged and maximised as much as possible;

(ii) Solid waste at all sources in the concession shall be separated and stored in different components of glass, plastic, paper and metal cans;

(iii) All non-biodegradable waste is to be removed from the concession area to Kasane landfill ;

(iv) All temporary waste holders at all sources in the concession area must be animal-proof and maintained as such;

(v) The use of organic (biodegradable) waste for compost purposes shall be permitted but will be subject to strict conditional approval by the Concession Management;

(vi) Solid waste management procedures shall be closely monitored by the Concession Management to prevent pollution and other adverse impacts, especially of the water resources.

10.1.10 For remote camping grounds a "carry in – carry out" policy shall be in place for all waste and litter, including food scraps. Generally, solid waste treatment should follow the Code of Conduct guiding the use of Wilderness Camping Ground. The Code is included in the draft Grading Standards For Camping Grounds In Botswana (BTO, 2012- part 3)

Clinical Waste

10.1.11 All clinical waste to be generated at all sources in the concession area shall be handled with extreme care and not be mixed with other solid waste. It shall be collected and stored in properly labeled Red Bags and transported to Kasane landfill for incineration. Transportation shall be by transporters authorized to transport clinical waste.

Hazardous Chemicals and Plastics

10.1.12 This Management Plan also strives to ensure avoiding, as well as effective handling of hazardous chemicals and plastics in the concession area. In this regard, the following is prescribed:

(i) The prospective concessionaire shall be required to demonstrate a firm policy against the use of any plastics and Styrofoam's throughout camps or lodges. This particularly important to the kitchen operations since it is proven that plastics migrate toxins into the food they contact.

(ii) The prospective concessionaire shall also be required to use only biodegradable pesticides, herbicides and fungicides. It was, in this regard noted that pest management has become increasingly difficult and many common pesticides have long-term side effects in terms of killing beneficial insects (birds, bees, etc.), bioaccumulation in animals and soil poisoning, especially for non-biodegradable pesticides, or pesticides that take a long time to degrade. Accordingly, there is demand for biodegradable pesticides or environmentally friendly methods for pest and insect control. Formulated from natural plant oils and botanical extracts new nontoxic, biodegradable, environmentally friendly pesticides are proven to have no harmful side effects.

(iii) There shall be a requirement for the prospective concessionaire to use nontoxic cleaners, solvents and paints. Most paint manufacturers now produce one or more non-VOC (Volatile Organic Compounds) variety of paint. These new paints are durable, cost-effective and less harmful to human and environmental health. In addition, there are also dozens of non-toxic highly effective commercial cleaners that are safe and healthy for the guests, staff and the environment.

Hazardous Materials Storage

10.1.13 Consideration needs to be given to the occasional need to appropriately store hazardous materials to avoid environmental damage from spillage or leakage or safety issues arising from unsafe handling in all camps and lodges in CH/12.

10.1.14 Storage areas need to be structurally sound, fire resistant, protected from extreme heat and exposure to sunlight, well ventilated, incorporate a bund to contain spills, be lockable and protected against animal entry.

10.1.15 It may be necessary within storage facilities to separate some chemicals from one another, particularly flammable from non-flammable materials and liquids below solids. Storage areas should also be free standing (desirable but not essential) and located away from living areas, property boundaries and watercourses.

10.1.16 Where toxic materials are stored, appropriately sign storage areas and have emergency protocols in place and ensure that staff understands their roles in the event of an accident.

10.2 WATER SUPPLY AND QUALITY

10.2.1 Availability (or rather scarcity) of potable water in CH/12, mainly provided from boreholes, is the long-term management issue prompting appropriate measures that would contribute to its conservation and rational use. This Tourism Management Plan therefore strives to ensure the effective management of potable water use through compliance with relevant legislation, as well as by taking into account availability of potable water, water demand, use and quality, as well as environmental issues for efficient use. With regard to this, the following is prescribed:

(i) It shall be the prospective concessionaire responsibility to manage the supply of safe potable water to all end users in CH/12 in accordance with the legal framework. He or she shall be required to identify the potential sources of potable water that could be utilised and the yield that they could sustainably provide in meeting the expected increase in tourist numbers in the concession area. The potential potable water sources identification shall not be limited to the available groundwater water sources within CH/12, but shall also consider other sources and/or methods of potable water supply;

(ii) Additional water point (boreholes) development shall be permitted in CH/12 but only at (or in close proximity to) accommodation sites and for purpose of potable water supply of new camps or lodges. In addition to this, the prospective concessionaire shall also be permitted to sunk and replace any problematic borehole in the concession by means of drilling a new one in close proximity to the existing borehole. The prospective concessionaire shall, however, not be allowed to develop any artificial water point at locations other than existing ones to provide water for wildlife.

(iii) If necessary, the prospective concessionaire shall be encouraged to introduce small potable purification plant systems in all camps or lodges so that they could produce their own filtered water rather than being dependant on bottled water. This could result in substantial reductions in the amount of waste plastic produced, as well as reducing the number of flights or truck trips that may be required to transport bottled water to the camps.

(iv) There shall be a requirement for organized water supply and quality monitoring in all camps and lodges to ensure that the use of potable water conform to standards set by the Botswana Bureau of Standards. The monitoring is expected to be regular, i.e. all year round to provide accurate continuous information through the different seasons and rainfall patterns. This data would contribute to the establishment of trends and spatial variations of water characteristics in CH/12. In addition, potable water quality monitoring may be required to expand beyond simple measurements, such as pH and conductivity, to metals, pesticides and other emerging contaminants in concession areas like CH/12. With regard to this, the prospective concessionaire shall be required to work on this aspect with the relevant government departments (DWA, DWMPC).

10.2.2 To ensure compliance with Energy Policy (2006) and to uphold the ecotourism best practices the prospective concessionaire is also encouraged to:

(i) Install flow restrictors throughout all accommodation and related backup facilities in the concession area;

(ii) Implement rainwater capture techniques so as to reduce the demand for potable water supplies from boreholes;

(iii) Investigate wastewater reuse and recycling solutions to as much as possible reduce dependency on potable water from boreholes;

(iv) Install low flush toilets;

(v) Implement water conservation education and awareness program among staff and guests;

10.3 ENERGY/POWER SUPPLY

10.3.1 This Tourism Management Plan recognises necessity for all camps and lodges in the concession area to make long-term commitment to energy efficiency, and to attain environmentally sustainable practices. Key challenges include replacement of power generators along with examination and investment into alternative energy-saving technologies. In this regard, the following is prescribed:

(i) Energy use must meet the Botswana Bureau of Standards (BOS 50-3: 2009) Grading Requirements for Lodges and Camps. The concessionaire shall also be required to demonstrate efforts in attaining environmentally sustainable practices in reduction of energy consumption. In this regard, all camps and lodges shall be required to avail the existing documentation that will serve to justify the selection and usage of a particular energy-saving technology and methods.

(ii) To eliminate carbon emissions associated with the burning of fossil fuels, all camps or lodges in CH/12 shall be required to deploy alternative solar power solutions for electricity generation to at least 60% of their total requirements for water pumping, refrigeration, dish washer, domestic appliances, and communications equipment;. It is also commended for all camps or lodges to be equipped with a bank of high-capacity batteries to provide power when the renewable energy source is temporarily unavailable and, thereby, allow the continuous operation of equipment and appliances. These storage batteries also allow the facility to operate for short periods of time electrical loads that require more power than that produced by the electricity generation system.

(iii) All camps or lodges in CH/12 shall be required to deploy renewable energy for lightening, as well as water heating systems such as solar geysers;

(iv) All camp or lodges are encouraged to deploy renewable energy cooking options (if feasible). Otherwise, using propane would generally be the preferred fuel for cooking applications because it burns more cleanly than others and minimizes indoor air pollution. Propane stoves rely on the pressure of the bottled gas to feed the fuel to the burners and condition it for combustion and, therefore, are easier to operate and maintain.

(v) With regard to refrigeration, the only practical renewable energy refrigeration option for camps and lodges in CH/12 consists of electric refrigerators and freezers powered with the energy obtained from renewable electricity generation systems. However, given that refrigeration units may be the highest single energy users in off-grid facilities that operate on a tight electricity budget, the equipment selected should be as efficient as possible. Energy-efficient refrigerators and freezers are costly but, as they typically consume 50% less electricity than standard models, they are worthwhile investments.

As refrigeration can account for 50 to 75% of the total electricity demand in energy-efficient eco-lodges, the use of a propane refrigerator/freezer can also be considered as option since it significantly reduce the size and cost of the required electricity generation system.

(vi) Though most energy requirements in ecotourism facilities in CH/12 are expected to be from renewable sources, it will still be necessary to have energy efficient back-up system. In this regard, the latest fuel cell generator equipment is strongly encouraged to be used as the standby backup power supply solution. The prospective concessionaire shall be required to incorporate all the impacts of the backup solution into the framework for a new camp or lodge development and design. Furthermore, measures shall be undertaken to ensure the reduction of noise levels as much as possible. Generators shall therefore be housed in buildings/structures with sound-dampening mechanisms and generator noise may not exceed 5Dbs above ambient noise levels at a distance of 100 m from the source.

(vii) The use of diesel based - generators for pumping water from boreholes in CH/12 is strongly discouraged. As already highlighted, the prospective concessionaire shall be required to replace all diesel-generator-based borehole pumps with more eco-friendly solar powered solution given the need to reduce operational costs, as well as oil and noise pollution around artificial water points.

10.3.2 The concessionaire is also strongly encouraged to align energy consumption practices in the concession area with, at least "Green" level eco-tourism standards, developed by the Botswana Ecotourism Certification System (BECS). "Green+" and "Eco-tourism" levels will be add advantages in rating concessionaires' commitments in CH/12 biodiversity conservation, environmental management and interpretation of the surrounding environment to guests. In addition to recommendation summarized above, the following energy consumption best practices are of particular importance:

(i) Limit the use of natural resources such as firewood to levels which will not impinge on the sustainable use of these resources;

(ii) Natural light should provide all necessary illumination to all areas of camp and lodges in daytime. Where natural light is not appropriate, lighting should be minimised to the limit required for safety and visibility of signs and displays.

(iii) Wherever possible, use only energy efficient appliances and battery chargers e.g. compact fluorescent light bulbs;

(iv) Ensure that natural ventilation is provided with air conditioning being strongly discouraged;

(v) Ensure that appliances are switched off when not in use and measure energy consumption on a routine basis;

(vi) Implement awareness program for energy conservation among guests.

(vii) Encourage and motivate staff for energy conservation

10.4 HANDLING OF OIL AND FUEL

10.4.1 It is prescribed that all petroleum products entering and leaving CH/12 shall be handled in environmentally secure containers and transported in environmental secure vehicles approved by the Department of Waste Management and Pollution Control. Give the ecotourism nature and sensitivity of the concession area, its biodiversity could be compromised by the side effects of improper transportation, handling and storage of hazardous substances. Some of these substances contain high levels of heavy metals and dioxins that could alter the ecosystem. Fuel (diesel and petrol) is the most common hazardous substance transported and stored. These petroleum

products contain environmentally harmful hydrocarbons emitted from incomplete fuel combustion and evaporation. Accidental spills or releases during fuel delivery may result in the discharge of hydrocarbons directly to the receiving water or via surface runoff or groundwater transport, causing pollution. Leaking storage tanks may also result in such discharges. As a result, precautionary measures that are considered best practices by international standards in transporting, handling and storing petroleum products and other hazardous substances are recommended for CH/12.

10.4.2 In general, all petroleum products generated in the concession area shall be stored, handled and transported in specifically designed containers and collected from CH/12 in safe containers and vehicles and disposed in Kasane at recommended depots.

Hazardous Substance Spill Contingency Plan

10.4.3 Transportation of fuel, particularly in difficult roads such as the ones in CH/12 has the potential to result in leakages and spills. Apart from transportation, vehicle service areas and/or leaking storage facilities have the potential to contaminate the surrounding environment. In order to minimize potential environmental harm, it is important that spills are contained and areas affected be treated. This is often achieved by using absorbent materials that absorb through capillary action. It is therefore prescribed that there shall be a Hazardous Substance Spill Contingency Plan by every tourism business for fuel spills in CH/12.

Guidelines for the Handling and Storage of Fuel and Oil

10.4.4 The management of hazardous substances in on-site in CH/12 requires an operator having contingencies for spent oil, means to collect or trap oil during vehicle maintenance using spillage traps or concrete slabs, and recommendations for disposal and handling used oil filters. As a result, best practices for operators and relevant authorities for transport, handling and storage of hazardous substances that can be adapted and applied to their use in CH/12 are listed below as follows:

1. Transportation

(i) All transport of hazardous substances in concession areas shall only be conducted by transporters who are licensed to handle hazardous substances;

(ii) Access routes to lodges and camps for hazardous materials must be clearly specified and agreed by the CMC, including provisions for water crossings

(iii) Drums and truck-box fuel tanks are acceptable methods of transporting oil and fuel;

(iv) All vehicles carrying fuel should have at least one 20 BC rated portable fire extinguisher;

(v) Drums and fuel tanks should be filled to a recommended level of 90%;

(vi) The load should be secured in a manner which ensures that:

- It does not escape from the vehicle
- It does not shift or sway in a manner that may affect the operation of the vehicle.

2. Storage

(i) Fuel storage tanks, whether aboveground or underground shall be located down slope from water sources;

(ii) Locate aboveground tanks over an impermeable liner made of concrete or other synthetic materials;

(iii) All underground tanks should be coated with fiberglass to prevent corrosion or use fiberglass tanks instead;

(iv) Aboveground tanks should be made of high quality steel;

(v) Fuel tanks should have spill and overfill protection

- Spill protection typically consists of a catch basin for collecting spills when the tank is filled;
- Overfill protection is a warning, such as a buzzer or an automatic shutoff, to prevent an overflow when the tank is filled.

(vi) Store hazardous substances such as paints and wood preservatives in the original container;

(vii) Store similar products together to reduce any danger from reactions in case of leakage or spill;

(viii) Store substances in a well-ventilated area;

3. Handling and Disposal

(i) All containers storing hazardous substances should be in good condition and clearly labelled

(ii) Containers and tanks should be closed and sealed except where a hazardous substance is being added or removed from the container;

(iii) Solid piping must be used between storage tanks.

(iv) Use a funnel when transferring substances between containers;

(v) Provide a stable platform for fuelling;

(vi) Follow the directions for storage on the label;

(vii) Used oil should not be mixed with other hazardous substances;

(viii) Never burn, dump or bury hazardous waste;

(ix) Do not flush wastes down sink or toilet

(x) Do not pour hazardous waste into ditches, storm drains or gutters

(xi) Completely drain all oil filters to ensure that they do not contain hazardous substances

10.5 OTHER SPECIFICATIONS FOR CAMPS AND LODGES IN CH/12

10.5.1 All semi-permanent camps and lodges in CH/12 shall have all facilities listed below as minimum requirement. Any change, alterations or additions at a later stage shall require the approval of the Chobe Land Board in accordance with the terms and conditions of lease agreement.

(i) Kitchen and stores;

(ii) Dining room;

(iii) Bar annex and common room;

(iv) Bedrooms in tents or chalets;

(v) Ablution facilities for both the bedrooms and the bar/dining area; and

(vi) Workshop and stores areas;

10.5.2 The ablution facilities for the bedrooms shall consist of showers, flush toilets and hand basins. The ablution facilities for the tents/chalets should be en-suite, while separate ablution facilities shall be provided for the dining room and bar areas. There shall be water-reticulated system for each camp/lodge in the concession area.

Staff Accommodation

10.5.3 The concessionaire shall provide proper staff accommodation for all staff, which should include spacious living quarters, a common kitchen, dining room and lounge, as well as water –borne sanitation facilities and basic privacy for all workers in the camps and lodges. The facilities shall also be made from semi-permanent materials.

10.5.4 A water flush toilet shall be provided for every four staff member. A shower providing hot and cold water for a maximum of four staff member shall be provided in close proximity to accommodation units.

Safety and First Aid

10.5.5 The safety of tourists and staff shall be of paramount priority for the concessionaires. A high degree of safety can be assured by adopting a few simple measures. At least one member of staff must be trained in first aid procedures. This training should be to the level of the ability to start and maintain an intravenous infusion. The member(s) of staff who undergo this training must go on 6-monthly refresher courses. The initial training required will only take approximately 4 days, with 3-4 hours each for refresher courses. Such courses are presently available in Kasane.

10.5.6 All camps and lodges must have two regularly maintained first aid kits. One shall be kept accessible in the kitchen, and one in the lodge reception area. Additional first aid materials shall be kept in vehicles and boats. It is, however, very important that all first aid materials available matches the ability of the person who might have to use it. All precautionary measures should be taken for the safety of tourists during game drives and walking Safaris.

10.5.7 Safety at airstrips is also very important. The following items shall be readily available at all airstrips in the concession areas:

(i) Fire extinguisher (and sand buckets);
(ii) Fire blanket;
(iii) Axe
(iv) Heavy duty gloves;
(v) Prise bar;
(vi) Sharp knife; and
(vii) Medicine cabinet.

11

Management Structures for CH/12 and Implementation Strategy

CHAPTER 11: MANAGEMENT STRUCTURES FOR CH/12 AND IMPLEMENTATION STRATEGY

11.1 INTRODUCTION

11.1.1 At present, CH/12 does not have any Concession Management Committee (CMC) mainly because the concession is under the jurisdiction of one concessionaire. While there is currently no major challenge caused by the lack of a CMC, in future there will be need for a CMC to coordinate natural resources management, biodiversity conservation, and tourism activities in the concession area. Coordination and cooperation will be critical in dealing with issues such as; of airstrip and trail system maintenance, cost-sharing agreements, fire risks and management, game drive code of conduct, potential conflicts resolution, and collective efforts aimed at monitoring the area's natural resource and biodiversity status. Furthermore, there is a multiplicity of stakeholder government departments having management and regulatory responsibilities over activities in CH/12, but with no strong mechanisms in place for the coordination of their different activities and responsibilities, particularly with regards to regular inspections and enforcement of legislations/regulations in CH/12.

11.2 RECOMMENDED MANAGEMENT STRUCTURES

11.2.1 This Tourism Management Plan prescribes some management structures that would facilitate the efficient running and coordination of activities In CH/12. These include the following:

CH/12 Concession Management Committee

11.2.2 A Concession Management Committee (CMC) shall be formed for CH/12. It shall be responsible for guiding the ongoing development in the concession and ensuring compliance with, and implementation of, agreed management regulations and requirements stipulated in this Tourism Management Plan. The CMC is expected to be composed of the prospective concessionaire, on-site camp or lodge managers, and, when necessary, may include representatives of surrounding communities, as well as the Technical Advisory Committee (TAC) which is a district body coordinated by the District Commissioner and facilitated by the Department of Wildlife and National Parks.

11.2.3 The functions of the Concession Management Committee shall include:

(i) Implementing co-management programs/or actions agreed between the prospective concessionaire and relevant Central and Local Government departments;

(ii) Collecting data and information as specified in the Tourism Management Plan;

(iii) Preparing CH/12 plans and programs of development, for formal submission to the relevant authorities;

(iv) Implementation of Codes of Conduct on game drive and other activities mutually agreed at the concession level;

(v) Identifying the main factors affecting natural resources in CH/12

11.2.4 The CMC in close cooperation with TAC shall also act as an arbitrator in the resolution of any conflicts arising amongst the concessionaire, community members, and/or mobile operators.

Annual Performance Review in CH/12 by Relevant Authorities

11.2.5 Chobe Land Board (CLB) and Botswana Tourism Organisation (BTO), together with other relevant government authorities shall be tasked to undertake an annual review of performance and activities in CH/12 against the objectives and goals established in this Tourism Management Plan and the lease agreement. The purpose of undertaking an annual performance review will be to:

(i) Determine how effectively the Tourism Management Plan has been implemented.

(ii) Assist in determining the focus for the annual plan of operation and the setting of appropriate time frames;

(iii) Enable effective Adaptive Management by identifying changes and modifying management interventions.

11.2.6 The Report of the Annual Tourism Management Plan Implementation Review is expected to be produced and be submitted to the CLB and BTO. The report should, amongst others, include:

(i) The results of an evaluation of the management effectiveness achieved at the concession area level.

(ii) Any recommended minor amendments to the Tourism Management Plan that do not affect the substance of the vision, objectives, or zonation.

(iii) Any proposed significant changes to the management plan that shall be supported by the CLB and BTO before being subjected to the Tourism Management Plan revision

11.3 STRATEGIC, ROLES AND RESPONSIBILITIES FOR THE IMPLEMENTATION OF THE MANAGEMENT PLAN

11.3.1 The implementation of various scales of plans is currently reported as the weakest link in the development process in Botswana. The Scoping Report noted the existence of a multiplicity of stakeholder Government departments, which have supervisory, regulatory and implementation roles over CH/12. This is in addition to the camps or lodges that would operate in the concession area, and carry out their own management functions individually. The present situation, as noted earlier, poses serious challenges in terms of managing the concession areas in a holistic and coordinated fashion, with defined roles, responsibilities and accountabilities clearly spelt out, for successful implementation and compliance with the guidelines and regulations of this Tourism Management Plan.

11.3.2 In light of the above, the strategy recommended for addressing the implementation challenges in CH/12 should be one that promotes coordinated implementation. Since coordination essentially entails working together for the purposes of achieving a common goal, the existence of a multiplicity of actors means that they should work towards a common goal. An implementation strategy for the Management Plan which is anchored on coordination would; a) ensure that implementation is appropriately guided by the objectives, guidelines, and regulations contained in this Management Plan, b) minimise (if not eliminate) duplication of efforts, and c) ensure that relevant implementing structures/departments are responsible and held accountable for implementation activities within their mandates. Coordination of implementation functions would also ensure effective communication, such that various implementation stakeholders know what each is doing at a given time. Other terms commonly associated with coordination include cooperation, mainstreaming, harmonization and alignment.

11.3.3 The successful implementation of the recommendations, guidelines, regulations and specifications put forward by this Tourism Management Plan will require the full commitment, acceptance, and

accountability by all those who will have responsibilities over its implementation. Furthermore, the implementation of the prescriptions and guidelines of the Tourism Management Plan implies increased workloads for relevant Government departments, the prospective concessionaire, and the Concession Management Committee. Consequently, the availability and adequacy of needed resources in the form of manpower, funds, and other logistical requirements, will be crucial for the implementation of this Tourism Management Plan. Table 11.1 presents defined implementation activities/roles for responsible implementing stakeholder departments.

Table 11.1: Roles and Responsibilities for Implementation of the Management Plan.

Category	Activity	Objective	Responsibility
Access Control	Issuance of permits for collection of veld products for subsistence purposes	To regulate harvesting of veld products such as grasses and wood resources	DFRR
	Patrols	To locate illegal activities such as cutting grasses and wood resources outside the agreed harvesting season	CMC (Anti-Poaching Team)
	Strengthen community leadership and control over natural resource use in CH/12	To strengthen the community leadership to prevent illegal activities	CMC, TAC, Tribal Admin (TA)
	Identify current subsistence use rights and their details (e.g. location, seasonality and purpose)	To define control mechanisms for subsistence use, in terms of who has the right to use natural resources and whether appropriate permits have been issued	CMC, TAC, Tribal Admin (TA)
	Monitoring of natural resource use and consumption in CH/12	To develop mechanisms for regular reviews and update stakeholders on possible changes	CMC
	Sensitising community on the "exclusive access status' of CH/12	To successful encouragement of responsible behavior among natural resource users	CMC, CLB, DFRR
Biodiversity and Conservation	Integration of biodiversity into the tourism development and planning	To ensure effective biodiversity conservation	CMC
	Development of a strong business case for biodiversity	To effectively integrate biodiversity into the tourism business	CMC
	Periodic systematic review of operation in relation to biodiversity and ecosystems service	To effectively integrate biodiversity into the tourism business	CMC
	Adoption of adaptive management	To respond and align tourism business to changing environment and ecosystems	CMC
	Initiate co-management	To ensure natural resources are sustainably managed with equitable benefit distribution to stakeholders	CMC and TAC
	Biodiversity monitoring	To acquire an in-depth understanding of trends and dynamics of key biodiversity components	CMC in collaboration with DWNP, DFRR,DWA
	Review of Invasive Alien Species (IAS) programmes in CH/12	To apply best practice approach to IAS control in CH/12	DFRR, DWNP
	Short- and long-term monitoring of Artificial water Points	To monitor and document the impacts of artificial water points on biodiversity components relying on indicators and methods summarized in the Tourism Management Plan	CMC, DWA, DEA, DWNP

Category	Activity	Objective	Responsibility
Wildlife Management	Establishment of Anti-Poaching Teams within the concession areas	To control and suppress illegal hunting in CH/12	CMC
	Ensure effective monitoring of wildlife	Establish the monitoring indicators and monitoring mechanisms	DWNP
	Regular patrols	To control illegal use of natural resources in CH/12	CMC's Ant-Poaching Team, DWNP, BDF
	Monitoring of endangered wildlife species	To minimize pressure on endangered mammal species	DWNP, CMC, Camp/Lodge Guides
	Wildlife disease surveillance	To identify key wildlife diseases in view of developing a disease management strategy	DWNP, Dept. of Veterinary services
	Identification of breeding sites for endangered birds	To locate and protect breeding sites for endangered bird species	Concession Manager, DWNP
	Aerial survey of wildlife	To monitor trends in wildlife population	DWNP
Management of Fires	Establishment of fire management teams	To ensure that there is effective fire suppression in the concession area	CMC
	Preparation of a prescribed burning plan	To ensure that controlled burning is done under suitable conditions	
	Inspection of fire management strategy for each lodge	To ensure that all the lodges are vigilant enough with regard to control of fires	DFRR
	Recording and mapping of fire incidences	To keep record of fire frequencies, their causes and noticeable impact of any.	CMC
	If required, seek permission to undertake prescribed burning from the Department of Forestry and Range Resources	To ensure that all controlled burning activities are authorised	CMC
	Long-term, systematic fire monitoring and research program to improve understanding of the fire ecology of the CH/12's ecosystem	Undertake a systematic and long term monitoring of post-fire recovery as an important strategy in improving understanding of the fire ecology in CH/12	CMC, DFRR
Minimizing adverse impact of tourism	Carrying out of EIAs before the development of tourism enterprises	To identify possible impacts of tourism on the environment	CMC
	Compliance with tourism carrying capacity of the concession area	To minimize possible impacts of tourism on the environment	CMC
	Monitor visitor impacts	Establish monitoring procedures and guidelines and train quality and monitoring experts	CLB, BTO, DWNP, CMC
	Monitor Service Quality		
Concession Management	Put in place proposed management structure	Establishment of a clear mechanism for the coordination of the activities at the concession area level	CLB, CMC
	Annual review of performance and activities in CH/12	To determine how effectively the management plan has been implemented	CLB, BTO, DEA, CMC
	The report of the annual management plan implementation review	To enable effective adaptive management by identifying changes and modifying management interventions	CLB,BTO,DEA, CMC
	Game driving Code of Conduct	To enforce or compile a "Code of Conduct for all professional guides in CH/12's camps or lodges".	CMC

Category	Activity	Objective	Responsibility
	Monitoring of game drive impacts	To ensure that thresholds that have been set for CH/12 are not producing any undesired effects.	CMC, DWNP
Accommodation Facilities	Phasing out the existing Bottle Pan Camp	To relocate the new camp or lodge on the periphery of the Bottle Pan and elevate quality of the facilities and services required for non-consumptive upper market lodging	The current lease holder
	Commissioning of a new 24-beds, luxury accommodation facility near Bottle Pan, attuned for photographic tourism purposes	To provide a high quality, non-consumptive remote lodging experience	Concessionaire
	Commissioning of a new 30-beds, accommodation facility near False Nunga Pan attuned for photographic tourism purposes	To provide a high quality, non-consumptive remote lodging experience	Concessionaire
	Establishment of mobile campground facilities	To identify a workable network of the campground micro-locations for each ecotourism management zones in CH/12	CMC
Service Infrastructure	Undertake the trail system evaluation in the concession area	To identify needs for development of new game drive trails or recommend their closure	CMC
	Develop appropriate liquid and solid waste management system	To ensure effective handling and management of liquid waste	CMC
	Abiding by the recommended guidelines for handling and disposing liquid and solid waste	To minimize environmental pollution by liquid waste from lodges/camps.	CMC
	Potable water supply in CH/12's accommodation facilities	To explore sustainable means of potable water supply for accommodation establishments in the concession, following recommendations prescribed in the Tourism Management Plan	CMC
	Deployment of alternative and low impact energy sources in camps or lodges	To minimize greenhouse gas emission and oil contamination risks	CMC
	Upgrading trail connecting the existing Bottle Pan airstrip to the new camp or lodge location proposed near the False Nunga Pan	To make trail more confortable to visitors	CMC
	Establishing access road that would connect the Nata - Kazungula (A 33) road to the proposed camp or lodge near False Nunga Pan	To provide access to the concession from the primary national road	CMC, DFRR

11.4 KEY ONGOING ADAPTIVE MANAGEMENT AND EVALUATION INTERVENTIONS

11.4.1 It was highlighted in the Scoping Report that the lack of informative and effective feedback is the commonest underlying cause of failure of Adaptive Management, which is strongly recommended for CH/12 by this Tourism Management Plan. As indicated, the hallmark of Adaptive Management is monitoring and ongoing learning and these only get proper results if all stakeholders apply their minds to adaptive management protocols. Table 11.2 below details procedures that should be used in CH/12, and by which the integrity of feedbacks, and hence learning, will be ascertained. It is expected that if all procedures and feedbacks summarized in Table 11.2 are effectively honored into the future, CH/12 is likely to achieve a well-deserved status as the one concession area that has championed adaptive management in Northern Botswana.

Table 11.2: Recommended Feedbacks and Procedures for Effective Adaptive Management in CH/12

Feedback	Procedure/Responsibility
Feedback on strategic planning actions in CH/12	This responsibility lies with the Concession Management Committee, and should be reported to the CLB and BTO: This includes report on implementation of the strategic objectives of this Tourism Management Plan, and implementation of the required studies, monitoring and research programmes,
Feedback on the implementation of the agreed management actions	This responsibility lies with the Concession Management Committee, and will be reported to CLB and BTO. Includes feedback on biodiversity management interventions. Particular attention is expected to be focused on reporting feedback on decisions and management actions relating to tourism development and monitoring of impact of AWPs on the biodiversity in the concession area
Feedback to CLB and BTO on the overall performance of CH/12 relative to its biodiversity and tourism development objectives:	This is expected to be done by the prospective concessionaire in the form of annual environmental (or biodiversity) evaluation reports of the concession area, as well as through other incidental reporting.
Feedback as to whether stakeholders' (or societal) acceptance of the consequence of developments in the concession area are still acceptable:	This is a longer-term adaptive evaluation and if expectations are largely met can be dealt with at the time of the five-yearly stakeholders' workshop held to review this Tourism Management Plan. If, however, significant unintended consequences materialise that have shorter-term impacts, it will be the responsibility of the CLB and BTO to sense this, reflect on it, and make appropriate recommendations to the Concession Management Committee.
Feedback as to whether the monitoring programme and list of targets and thresholds is effective	This is generally the responsibility of the Concession Management Committee in cooperation with the key Central Government departments such as DWNP, DWA, DWMPC. It is anticipated that the financial and other cost implications of carrying out the required biodiversity and other monitoring procedures may require motivation, justification and discussion.

Feedback	Procedure/Responsibility
Feedback as to whether the prescribed targets or thresholds for tourism development or biodiversity objectives are violated, or can be relaxed in the future	Targets and/or thresholds are expected to be monitored and reviewed periodically by the Concession Management Committee on the basis of expert advice. This requires implementation of the monitoring programmes recommended in this Tourism Management Plan. The CMC is required to prepare documented feedback report to CLB and BTO on the prescribed targets or thresholds that are either violated or may be relaxed in the future
Feedback as to whether overall concession objectives need adjustment in the longer-term:	This is dealt with effectively at the five-yearly management plan review step. However, in the case of perceived "emergencies", the Concession Management Committee and all other stakeholders' involved in the management of CH/12 are expected to raise concerns and sensitize the CLB and BTO about the problem

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REFERENCES:

Baldwin, DS, Nielsen, DL, Bowen PM, Williams, J. (2005). Recommended methods for monitoring floodplains and wetlands, Murray-Darlin Basin Commision, Australia.

Borrini-Feyerabend, G. (2000). CO-management of natural resources: organizing, negotiating and learning -by-doing. IUCN. Yaoundé, Cameroon.

Christo Fabricius and Eddie Koch- (2004) Rights, Resources and Rural Development Community-based Natural Resource Management in Southern Africa, EarthScan,

Chase , M (2011). Dry season fixed wing aerial survey of elephants and wildlife in northern Botswana. Elephant Without Boarders, Botswana

CoP(2005). An integrated framework for wetland inventory, assessment and monitoring (IF-WIAM). 9Th Meeting of the Conference of Parties to the Conversion of Wetlands (Ramsar, Iran, 1971). Kampala, Uganda.

Department of Tourism, DOT. (2010) A Statistical Review of Tourism 2009, Department of Tourism, Gaborone

Debenham, F (1952). The Kalahari today . The geographical Journal Vol 118 1952

Dubel Integrated Environmental Services (DIES), (2012), 9th Ecological Evaluation for CHA CH/12, Unpublished Report for Bottlepan Safaris, Botswana

Ecosurv, (2012), Management Plan for Controlled Hunting Area CT/1, Gaborone, Botswana

Ecosurv, (2012), Management Plan for Controlled Hunting Area CT/2, Gaborone, Botswana

Ecosurv, (2012), Management Plan for Controlled Hunting Area CT/3, Gaborone, Botswana

EnviroNET Solution (2006), ODMP- Fire Management Plan, Draft Report

Gaines, W.L., Harrod J.R., Lehmkuhl (1999). Monitoring biodiversity Quantification and interpretation. United States Department of Agriculture.

Government of Botswana (2009), Consultancy for Review of Wildlife Management Areas (WMA) Regulations and The Community, Wildlife & Natural Resources And Tourism Lease Agreements – Final Guidelines, Prepared by BiOkavango Project.

Government of Botswana (2010), Wildlife Management Regulations.

Heinl, M., Sliva, J., Murray-Hudson, M., and Tacheba, B. (2007). Post-fire succession on savanna habitats in the Okavango Delta wetlands, Botswana. Journal of Tropical Ecology, 23: 705-713.

Heinl, M., Sliva, J., Tacheba, B. and Murray-Hudson, M. (2008). The relevance of fire frequency for the floodplain vegetation of the Okavango Delta, Botswana. African Journal of Ecology, Vol 46, 3, : 350-358

Kalikawe, M.C. (2001). Botswana: Integrating biodiversity into the tourism sector. UNEP-Biodiversity support planning programme. UNEP International Workshop of best practices and Countries case studies.

Keith D.A., Martin, T,G., McDonald-Madden, E., Walters, C . (2011) Uncertainty and adaptive management for biodiversity conservation. Biological conservation 144: 1175-1178.

McNeel et al, (1994), Tourism Management In Protected Areas Worldwide. IUCN

Ministry of Local Government, Lands and Housing (1995), Management Plans for Controlled Hunting Areas Allocated to Communities In Ngamiland WMAs. Prepared By Okavango Community Consultants.

Ministry of Local Government, Lands & Housing (1998). Botswana's Strategy for Waste Management. First Edition. Ministry of Local Government, Gaborone.

Ministry of Local Government (2001). Botswana's Policy for Wastewater and Sanitation Management. Ministry of Local Government, Gaborone.

Plavsic, M.J., Heinl, M., and Cassidy, L. (2011). Ecological and socioeconomic dimensions of anthropogenic fire in southern Africa: An interdisciplinary synthesis. Poster presented at the 96th ESA Annual Meeting.Austin, Texas, USA.

Qasim S.R. (1999). Wastewater Treatment Plants: Planning, Design and Operation. CRC Press.

Shand, E.A. (2001) Intergrating biodiversity conversation into the tourism sector in Trinidard and Tobago- A case of effective local community participation. Port of Spain, Trindard and Tobago

Trollope, W.S.W (1999). The use of fire as a management tool. In *Veld management in South Africa*, ed. N. M. Tainton, 240-242. Pietermaritzburg, South Africa: University of Natal Press.

Trollope, W.S.W., Trollope, L.A., Austin, C.de Bruno, Held, A.C., Emery, A. & Hines, C.J.H., (2006). A fire management plan for the. Okavango Delta Ramsar Site. DEA.

Walters, CJ., Holling, C.S., (1990). Large scale management experiments and learning by doing. Ecology 71, 2060-2068

Williams, B.K., (2011) Adaptive management of natural resources-framework and issues. Journal of Environmental Management 92: 1346-1353

Appendix A:

Code of Conduct for Grass Cutting in CH/12

Code of Conduct for Grass Cutting in CH/12

Preamble

Grass cutting in CH/12 is a seasonal activity that attracts harvesters from different parts of Botswana. A temporary camp is usually set near the Nata -Kazungula (A33) main road during the grass cutting season starting from 15th July to 20th Ocober every year. These camps accommodate up to 200 people in any grass-cutting season. While there is a permit system which is intended to regulate grass cutting, the system does not effectively regulate the number and conduct of these temporary settlers leading to emergent environmental concerns. There are several environmental challenges in grass cutting camps, chief amongst which is the lack of sanitation facilities, indiscriminate solid waste disposal, and the inappropriate use of fires. Given the complexity of grass cutting issues, a code of conduct for grass cutters in the area is an absolute necessity, hence the present Code of Conduct proposed in this Tourism Management Plan for CH/12.

The development of the Code of Conduct for Grass Cutting in CH/12 was a coordinated effort of Reference Group assembled for the CH/12 Tourism Management Plan, and as such, it should not be taken as the Code proposed by the Department of Forestry and Rangeland Resources. The legislative framework upon which this Code of Conduct rests is the Agricultural Resources Conservation Act of 1974, and the Agricultural Resources (Utilization of Veld Products) Regulations of 2006.

Permit

(i) All grass harvesters shall report their presence to the tribal authorities in Pandamatenga Village where information about dedicated seasonal thatching grass collection zones in CH/12 shall be communicated to grass harvesters

(ii) Anyone who intends to harvest thatching grass in CH/12 shall apply for a permit from the Department of Forestry and Range Resources (DFRR) in Kasane. Dealers permit must be obtain when harvesting for commercial purposes. The Permit system should take into cognizance the ongoing review/consolidation of the Forest Act, Herbage Preservation Act and the Agricultural Resources Conservation Act by DFRR

(iii) Commercial thatching grass in CH/12 shall be collected at dedicated seasonal grass collection zones or points

Grass Cutters' Committee

(i) At the beginning of every grass cutting season, the cutters shall elect a committee which shall oversee the grass cutting activities and ensure that the Code of Conduct is observed.

(ii) The composition of the Committee shall be determined by the grass cutters themselves, benefiting from their own indigenous knowledge of regulating the harvesting of grass resources

(iii) The Committee shall liaise with the CH/12 concessionaire, tribal authorities in Pandamatenga Village, Department of Wildlife and National Park (DWNP), Department of Forestry and Range Resources (DFRR) and report or raise any issues affecting the sustainable harvesting of grasses.

(iv) The Committee shall keep a register of all the people in the camp and their specific activities (i.e. whether they are cutters or just buyers who buy from the cutters). Any unaccounted for persons in the area shall be reported to the authorities or security personnel

(v) The Grass Cutters' Committee shall keep records of the number of bundles of grass each harvester collects per day

(vi) The Committee shall maintain a record of all vehicles used in the grass cutting activities

(vii) The Committee shall keep an eye on any illegal activities such use of unlawful drugs and poaching

(viii) The Committee shall regulate camping arrangements, making sure that fire prevention measures are taken

(ix) The Committee shall arbitrate any conflicts which may arise among grass cutters, and between grass cutters and the local communities especially from the nearby settlements, arable farms, cattle posts, and tourism activities

Grass Cutting Season

(i) All grass cutters must adhere to the stipulated harvesting season of 15th July to 20th October.

(ii) Anyone found cutting grass outside the grass-cutting season shall be liable to a fine as stipulated in the Agricultural Resources (Utilization of Veld Products) Regulations of 2006.

Grass Cutting Times

(i) The Grass Cutters' Committee in collaboration with the CH/12's Concessionaire shall be required to schedule all grass cutting and sites' cleaning activities in the concession

(ii) To ensure the compliance with the agreed schedule, Grass Cutters' Committee and the Concessionaire shall be entitled to inspect grass cutting sites and activities at a reasonable time with regular intervals

Temporary Overnight Camping Site

(i) Location of a temporary grass cutting camp shall not be less than 100metres from the the A33 (Nata-Kazungula national Primary Road). Chobe Land Board shall be responsible for identifying a site if the temporary grass cutting camp site fall within tribal land;

(ii) No temporary overnight structures or camp sites shall be allowed at any of the designated grass cutting sites or zones in CH/12

Dismantling of Temporary Grass Cutting Camp at the end of the Grass Cutting Season

(i) All grass cutters shall dismantle their temporary shelters at the end of the cutting season.

(ii) All grass cutters shall clean their camp before abandoning camp at the end of the cutting season. Measures to avoid site and vegetation damage should be considered and implemented

(iii) The relevant District authorities, together with the Tribal Authorities in Pandamatenga Village, shall inspect the grass cutters' temporary camp site(s) at the end of the season to ensure compliance with the Council's regulations and all other requirements of the applicable laws. This shall be done in the presence of all Grass Cutters' Committee members.

Waste Management

(i) All grass cutters shall remove all food remains and seal them in plastic bags, store them, and pack them out. Under no circumstances should food remains be buried. Discarded or buried food remains or scraps attract animal life.

(ii) All nonorganic litter such as cans, bottles, plastic products, etc. should be deposited at a central place where they will be collected and disposed of at an appropriate place in Pandamatenga. Litter should not be buried or scattered. Special care must be taken to avoid leaving inconspicuous pieces of litter such as "twist-ties" or the aluminum foil that lines paper products.

(iii) Indiscriminate littering shall be considered a serious offence punishable by existing law

(iv) Used or discarded toilet paper and sanitary products shall be packed out, burnt completely to ash in a small hole excavated in soil, and buried. These items shall never be buried raw as animals, seasonal runoff and winds may unearth them.

(v) Biodegradable materials such as food remains shall also be burnt to ash in a small hole excavated in soil, and buried to avoid attracting and habituating scavengers such as jackals, hyaena, baboons, monkeys, and crows. All grass cutters shall not scatter or bury raw food scraps as they will attract such animals

Sanitation

(i) All grass cutters shall be responsible for depositing and disposing waste in a manner and place that minimize the risk that others will encounter the waste, or that it will reach water sources. These risks can be most effectively minimized by walking some distance away from the grass cutting sites, trails, and water bodies to seek a deposition or disposal site. Adequate burial minimizes the likelihood of encountering human waste, and the associated risk of contamination.

(ii) During grass harvesting, human waste shall be buried in long drops. The dimensions of the hole for the long drop toilet must not exceed 30cm2 across x 1.5m deep. The hole should be filled in with soil when it is 30 cm from full. There must be one long drop per eight persons at the grass-harvesting site.

(iii) When at the grass harvesting site in CH/12, all grass cutters shall minimize the use of soap for bathing or washing laundry in or near water bodies. Instead, they are encouraged to use wash bowls or makeshift showers at least 60 meters from the nearest water source to avoid contaminating surface water bodies.

(iv) It will also be a requirement for the grass cutters to comply with all modifications of sanitation standards and code of conduct that may be proposed by the relevant authority.

Use of Fire and Fire Prevention Measures

(i) At the grass cutting sites in CH/12, no fire shall be used

(ii) No cooking shall take place at the grass cutting sites in CH/12

(iii) Smoking tobacco shall by all means be avoided in grass cutting sites, or be restricted to non-vegetated or cleared areas. Any tobacco stubs or remains after smoking shall be deposited, completely burned and buried in a hole, or extinguished with water and packed away to disposal sites.

(iv) No one shall be allowed to burn grass cutting sites for whatever reason without express permission from relevant authorities.

(v) Everyone shall be expected to report any potential fire hazards to the Grass Cutters' Committee

(vi) All grass cutters shall note that burning the veld without permission is an offence punishable by law.

(vii) All grass cutters shall be expected to carry sufficient water where possible to the grass cutting sites to enable them to use some of the water to extinguish accidental fires in case of a fire outbreak.

(viii) As indicated, burning of used or discarded toilet paper and sanitary products, as well as biodegradable material such as food remains or scraps shall be allowed at the grass cutting sites only when they are completely burnt in a hole excavated in soil. After burning, there shall be a requirement to remove all evidence of the fire by burial and camouflaging the surface with soil and/or plant debris.

Off-road Driving

(i) Drivers of vehicles that collect grass from the grass cutting sites in CH/12 shall use the existing cutline and recommended tracks to minimize off-road driving.

(ii) Night driving in grass cutting sites shall not be allowed

Interaction with Wildlife and Domestic Animals

(i) All hunting activities shall be prohibited in the Concession and shall be reported to relevant authorities (DWNP, BDF, and Police) by the Grass Cutters' Committee members

(ii) No pets such as dog and cats shall be allowed in the grass cutting camps

(iii) Feeding of wild animals such as baboons and monkeys shall not be allowed. This also applies to either accidentally or deliberately leaving food remains or scraps behind.

(iv) All grass cutters shall store food brought at the grass cutting sites in such a way that animals cannot access it.

(v) All wildlife in the grass cutting sites shall not be approached or disturbed from their calving sites, drinking sources, feeding grounds, or refuge

(vi) All grass cutters are expected to be vigilant to ensure safety from dangerous wild animals

(vii) All grass cutters shall avoid provoking wildlife by shouting and throwing objects at them.

(viii) The Grass Cutters' Committee shall invite DWNP officials to brief them on how to conduct themselves in wildlife areas.

(ix) All grass cutters shall avoid making loud noises by shouting or playing loud music

Trading at the Grass Cutting Camp

(i) Anyone wishing to operate a tuck-shop at the grass cutters' camp shall notify the Grass Cutters' Committee

(ii) The sale of alcoholic beverages at the grass cutters' camp without a license shall not be allowed, except for traditional brews

(iii) All those who intend to sell alcoholic beverages shall notify the tribal authorities of Pandamatenga Village

(iv) Anyone selling alcoholic beverages without appropriate licenses shall be reported to the nearest relevant authorities (Police at Pandamatenga Village)

Awareness Raising

(i) This Code strongly recommends establishment of an effective cooperation between CH/12 Concession Management, Chobe Land Board, Department of Forestry and Rangeland Resources and traditional leaders in raising awareness through a pro-active education campaign amongst all prospective grass-cutters. Soliciting understanding and cooperation of grass cuttres is envisaged as a vital preemptive approach that CH/12 Concession Management, together with other relevant Central Government departments should adopt in encouraging grass cutters' responsible behaviour. Effective communication has in this regard been identified as the key to success. It shall concentrate on building awareness of all prospective grass cutters and encouraging them to instill discipline and responsibility towards conservation of resources in CH/12 concession area and its surroundings.

Appendix B:

Common, Scientific, and Local Names List of Plants And Animals Found in CH/12

Scientific, Local, and Common Names of Some Plants Found in CH/12

Scientic (Latin) Name	Local (Tswana) Name	Common (English) Name
Woody Plants		
Dicotyledons	**Ditlhare/Ditlhatshana**	**Trees/Shrubs**
Acacia erioloba	Mogotlho	Camel thorn
Acacia fleckii	Mohahu	Blade thorn
Acacia luederitzii	Mooka, Mokgwelekgwele	Kalahari sand thorn
Adansonia digitata	Mowana	Baobab
Baikiaea plurijuga	Mokusi	Zambesi Redwood
Boscia albitrunca	Motlopi	Shepherd's tree
Burkea africana	Mosheshe/Monato	Wild syringa
Colophospermum mopane	Mophane	Mopane
Combretum collinum	Modubana	Variable combretum
Combretum hereroense	Mokabi	Russet bushwillow
Combretum imberbe	Motswere	Leadwood
Croton subgratissimus	Moologa	Lavender fever berry.
Erythrophleum africanum	Mmako/Mokonkochi/Mobaku	Ordeal tree
Mundulea sericea	Mohato/Mositatlou	Cork bush
Schinziophyton rautanenii	Mongongo	Manketti/ Featherweight tree
Terminalia sericea	Mogonono	Silver cluster-leaf
Grasses		
Family Poaceae	**Majang**	**Grasses**
Aristida congesta	Seloka	Spreading Three-awn
Aristida stipitata		Long-awned three-awn
Bothrichloa insculpta		Pinhole Grass
Brachiaria nigropedata		Spotted brachiaria
Cenchrus ciliaris	Modikangwetsi/Mosekangwetsi	Foxtail Buffalo Grass
Cynodon dactylon	Motlho/Motlhwa	Couch Grass/Bermuda grass
Digitaria eriantha		Digit/Finger grass
Eragrostis pallens	Motsikiri	Broom grass
Eragrostis rigidior	Rathethe	(Broad) Curly Leaf
Eragrostis superba	Mogamapudi	Fan Grass/Brown Rhodes Grass
Eragrostis viscosa		Sticky lovegrass
Heteropogon contortus		Spear Grass
Panicum kalahariensis		
Schmidtia pappophoroides	Tshwang/Bojang jwa pitse	Sand quick
Sporobolus fimbriatis		Fringed dropseed
Sporobolus ioclados		Pan dropseed
Stipagrostis uniplumis	Tshikitshane	Glitter grass/Shiny bushman grass
Urochloa trichopus	Phoka	Signal grass

Scientific, Local, and Common Names of Some Plants Found in CH/12

Scientific (Latin) Name	Common (English) Name	Local (Tswana) Name
Mammalian Herbivores	**Herbivores**	**Dijatlhaga**
Loxodonta africana africana	African savanna elephant	Tlou
Aepyceros melampus	Impala	Phala
Ceratotherium simum	White rhinoceros	Tshukudu e tshweu
Diceros bicornis	Black Rhinoceros	Tshukudu e nthso
Equus burchellii	Burchell's Zebra	Pitse ya naga/ Pitse e tilodi
Giraffa camelopardalis	Giraffe	Thutlwa
Hippopotamus amphibius	Hippopotamus	Kubu
Hippotragus equines	Roan antelope	Kwalata e tshetlha
Hippotragus niger	Sable antelope	Kwalatae ntsho
Oryx gazella	Gemsbok	Kukama
Phacochoerus africanus	Warthog	Mathinthinyane/Kolobe
Raphicerus campestris	Steenbok	Phuduhudu
Sylvicapra grimmia	Common Duiker	Phuti
Syncerus caffer	Buffalo	Nare
Taurotragus oryx	Eland	Phofu
Tragelaphus strepsiceros	Kudu	Tholo
Order Carnivora	**Carnivores**	**Dibatana**
Canis adustus	Sidestriped jackal	Sekgee/Rantalaje/Phokoje
Canis mesomelas	Black-backed jackal	Phokoje wa mokwatla montsho
Crocuta crocuta	Spotted hyaena	Phiri
Felis nigripes	Black-footed cat	Sebalabolokwane
Hyaena brunnea	Brown hyaena	Phiri
Lycaon pictus	Wild dog	Letlhalerwa
Mellivora capensis	Honey badger	Matshwane/Magogwe
Panthera leo	African lion	Tau
Panthera pardus	Leopard	Nkwe
Papio ursinus	Chacma baboon	Tshwene
Class Reptilia	**Reptiles**	**Digagabi**
Bitis arietans	Puff adder	Lebolobolo
Dendroaspis polylepis	Black mamba/Southern brown mamba	Mokwepa o montsho
Dendroaspis viridis	Green mamba	Mokwepa o motala
Kinixys lobatsiana	Leopard tortoise	Khudu
Python sebae	African rock python	Tlhware
Class Aves	**Birds**	**Dinonyane**
Accipiter spp.	Goshwak	
Anas erythrorhyncha	African teal ducks	Sehudi
Bucorvus leadbeateri	Ground hornbill	Lehututu
Numida meleagris	Crested guineafowl	Kgaka
Sarkidiornis melanotos	Knob-billed duck	Sehudi
Struthio camellus	Ostrich	Ntshe
Terathopius ecaudatus	Bateleur eagle	Ntsu
Torgos tracheliotos	Lappet-faced vulture	Lenong

Arthropoda	Invertebrates/arthropods	Ditshidinyana
Family Isoptera	Termite	Motlhwa/Moruthwane
Family Myriapoda	Millipede	Sebokolodi
Family Scarabaeidae	Dung beetle	Khukhwane ya boloko/Pitike
Gonimbrasia belina	Mopane Worm	Phane