



Preliminary Literature Review on Sacred Species

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1. INTRODUCTION

Research goals

This report is the result of a first bibliographic research on sacred species, focussing primarily on plants and animals species, but tackling also sacred mushrooms and with sacred sites in mind too.

The main research goal is to cover the existing gap and therefore illustrate the state of the knowledge on the subject, providing first basic data on sacred species bibliography useful to access general and specific material on the subject. However, the underpinning goal is to outline issues on sacred values, which retain conservation significance and therefore need to be considered. This research should hence provide inputs to the work of the IUCN Species Programme and Commission on matters related to social, economic and cultural values of species.

The result is a brief literature review on spiritual values of animals and plants that, for its character of being pioneering, has to be considered merely a starting point to develop knowledge and search literature further.

Research method

Bibliographic sources has been searched, analysed and reviewed starting from relevant literature on spiritual and cultural values of nature, biodiversity and species. These sources, together with others, have provided references on sacred animals (chapter 3), sacred plants (chapter 4) and sacred mushrooms (chapter 5). The study has however always included a view on sacred sites and on other sacred fonts too. The review has allowed reaching the conclusions illustrated in chapter 6. References are the key research tool and therefore listed carefully in chapter 7 and divided among those in the text, and those not discussed in this report but providing further references that could be worth it exploring in the future. All references follow the Cambridge reference style.

Specifically, out of nearly a thousand references collected, among which many irrelevant or out of place (like those on the Christian Sacrament called “sacred species”), only those available and pertinent to sacred species have been examined.

In particular, the research deals with:

sacredness of species and its importance

type of human use of sacred species, non consumptive (e.g. religious, veneration, sacrificial, rights, healing/sacred)

type of impact these uses have on the environment (e.g. positive, negative)

whether sacred species are endangered and the reasons

in which way the awareness of sacredness will further conservation

what knowledge is needed to cover the existing gap on sacred species data.

Report framework

The report has been structured around the main subject of research, namely literature on sacred species, i.e. animals, plants and mushrooms, organised in turn in chapter 3, 4 and 5.

Chapter 2 illustrates the fields of exploration for the research, subdivided into core information and additional information.

Chapter 3 is tailored on animals, including their worship, sacred rituals and traditional hunting.

Chapter 4 focuses on plants, covering flowers, trees (including ancient trees), bushes, groves, forests, religious and holy plants, and traditional medicine plants.

Chapter 5 regards sacred mushrooms.

Conclusions and suggestions to progress the research further are outlined in chapter 6.

Chapter 7 lists in the first section, in alphabetic order, all references quoted in chapters 3, 4 and 5, provides in the second section further key references for the subject not quoted in the text, and finally lists all the references in the last section.

2. FIELDS OF EXPLORATION

Classification of Species for the research

A biological classification of species has been used in the research following that used by IUCN Red List.

Within the Sacred Plants section, trees are identified in the headings.

Sacred Plants, Animals and Mushrooms are investigated according to the following:

SACRED ANIMALS

Mammals

Birds

Reptiles

Amphibians

Fish

Insects

SACRED PLANTS

Conifers

The Ginkgo

Monocotyledons

Dicotyledons

SACRED MUSHROOMS

Database and Fields of Exploration for the research

CORE INFO
1 GROUP: mammals, birds, fish, reptiles, insects etc
1 SPECIES name (Latin, local)
2 RED LIST category
3 ETHNIC OR BELIEF GROUP (holding as sacred)
4 LOCATION (geographic)
ADDITIONAL INFO
5 SACREDNESS (holy, religious, veneration, sacrificial, healing, magic, rites, totem, traditional medicine, animist, ancestral spirits etc)
6 7 HUMAN USE
6 HUMAN BEHAVIOUR linked with sacredness
7 RESTRICTION related to species
8 9 CONSEQUENCES and CONSERVATION IMPLICATIONS (in which way the awareness of sacredness will further or not conservation)
8 TYPE OF IMPACT these uses have on species in particular (if endangered and the reasons)
9 TYPE OF IMPACT these uses have on the environment in general (e.g. positive, negative)

EXPLANATION

Core Info (for almost all species searched)

1. Type of species or group of organism
2. IUCN Red List, only stated when the species is threatened
3. Who regards as sacred (ethnic group or religion)

4. Location (where they live)

Additional Info (when available)

5. Why is regarded sacred (mythology associated, history, believes, sacred uses)
6. Human behaviour related to species (what they do with it or about it)
7. Restriction related to species (rules or believes associated with braking the restrictions)
8. How people have been involved in conserving it or destroying it
9. Other info e.g. contemporary consequences of its sacredness (rights connected to species, e.g. holding a patent on a species)

Following the format generally used in the academic literature, the native name of the animal or plant and the Latin name of the species are given in italics.

Wherever possible the species name has been specified, but in a few cases only higher order groupings were identified in the literature.

The core information is given for all species included in this review; for most species some additional information is presented to show how people behave towards the species, and how this may affect the species' conservation.

3. SACRED ANIMALS (Kingdom Animalia)

Mammals (Class Mammalia)

The Bear (Family Ursidae)

The bear is widely revered by the people of the far north. The descendants of the Ainu living on Hokkaido, Sakhalin and the Kuril islands of Japan traditionally adopt a young bear, raise it as a pet, and then ceremoniously sacrifice it (Kitagawa, 1961; Sax, 2001).

Inuit legends tell of humans learning to hunt from the polar bear, *Ursus maritimus* (IUCN Red-Listing: Vulnerable; IUCN, 2006). For the Inuit of Labrador, the polar bear is a form of the Great Spirit, *Tuurngasuk* (Sax, 2001).

The Bison (*Bison bison*)

The bison is currently listed as Lower Risk – Conservation Dependent in the IUCN Red List (IUCN, 2006), meaning that it is the focus of on-going conservation programmes without which it would qualify for a threatened category. The bison is regarded as a sacred species by the Sicangu band of the Lakota Nation in South Dakota, U.S.A.; the Lakota's creation story tells of humans being direct descendants of buffalo (The Buffalo War, downloaded 2007; feministing.com, downloaded 2007). Current attempts to conserve the last remaining herd of bison in Yellowstone National Park are being led by Rosalie Little Thunder of the Lakota people and Michael Mease. However bison are still being culled because local ranchers fear that they spread a disease called brucellosis to cattle.

The Indian Cow (*Bos indicus*)

In India and Nepal, Hindus hold cows to be sacred. The zebu, or *Bos indicus*, is the main species found in India. The cow forms an integral part of Hinduism, which forbids its abuse or killing. Consequently cows are found throughout India, and are considered by some to cause a nuisance by blocking roads. Cow ownership is very high, and cow products such as milk and dung are in great demand. Zebu calves are also highly valued because from bulls come oxen, which are the mainstay of India's agricultural system (Harris, 1978).

The Deer (Family Cervidae)

Many Native American peoples, such as the Zuni and Hopi, celebrate the deer with a traditional deer dance to influence the elements and bring bountiful crops. The Yaqui Indians have incorporated the deer dance into an Easter ritual. The chief dancer will wear either the head of a deer or horns and will imitate the movements of the animal as it moves cautiously through the forest (Sax, 2001).

The Elephant (*Elephas maximus*)

The Asian elephant is held sacred amongst the Hindus of the Indian region. It appears in Hindu myths: after the sun had hatched from the cosmic egg, Brahma took the two shells in his hands and chanted; the elephant Airavata emerged from the shells and later became the mount of the god Shiva, followed by fifteen other cloud elephants. Ganesha (or Ganesh), the mischievous elephant god of wisdom, remains one of the most beloved deities of the Hindus (Sax, 2001). Elephants are still frequently seen outside Hindu temples, and are depicted in ancient sculptures. The elephant has been domesticated for millennia in India, and performs a number of functions, such as moving wood and carrying people (mainly tourists these days). It is listed as Endangered on the IUCN Red List (IUCN 2006).

The Grey Wolf (*Canis lupus*)

The grey wolf plays an important role in the history and culture of the Nez Perce people of Idaho, USA. The Nez Perce people recognise many similarities between the wolves' and their own family-centred hunting lifestyle. The wolf has also come to symbolize the tribe's struggle for existence. In March 1995, the U.S. Fish and Wildlife Service (FWS) entered into a cooperative agreement with the Nez Perce Tribe to restore the grey wolf to Idaho; this is the first time the Federal government has contracted with a Native American tribe to lead recovery and management responsibilities for a state-wide recovery effort of an endangered species. Many agencies have become involved in the partnership, including the Bureau of Indian Affairs, U.S. Forest Service, and Wildlife Services. The partnership is nationally recognized as a model for defining relationships between Federal and Native American governments. The wolf recovery is proceeding successfully (Mack, 1999).

The Hippopotamus (*Hippopotamus amphibius*)

In many parts of Africa people venerate a hippopotamus goddess resembling Tawaret, the ancient Egyptian goddess with the head of a hippopotamus and the body of a pregnant woman. The Ronga people of southern Mozambique tell of a woman who gave her son to a hippopotamus goddess for protection; the goddess raised the boy

beneath the river but brought him up every evening to be suckled by his mother (Sax, 2001).

The Leopard (*Panthera pardus*)

Many groups in West Africa regard the leopard as a sacred animal; for example, amongst the Ashanti people, killing a leopard is traditionally punishable by death (Olupona, 1993).

The Monkey

The monkey is a sacred animal in India, as Hanuman is the monkey god of the Hindus. The Hindu population of Bali, Indonesia, regard the long-tailed macaque monkeys (*Macaca fascicularis*) as sacred, and some live as temple monkeys. They are also recognised as sacred in parts of nearby Kalimantan (Wheatley, 1999; Dudley et al., 2005).

Two species of monkey, the black and white colobus (*Colobus vellerosus*) and the Mona monkey (*Cercopithecus mona*) are revered and strictly protected as sons of the gods of the people of Boabeng and Fiema villages in Ghana. In the past, when a monkey died, the corpse was given the same respect and funeral rites as for a human. The Boabeng Fiema-Monkey sanctuary is an example of a sacred grove (sacred because of its monkey inhabitants) which is protected both by customary law and modern legislature under District Council by-laws; it is managed as a wildlife sanctuary. This small forest now supports the highest density of these two species anywhere in Ghana (Dudley et al., 2005).

The Reindeer (*Rangifer tarandus*)

The Nenets (formerly known as Samoyeds or Yuraks) of northeast Europe and west Siberia have many rituals around reindeer, which form the centre of their lives. The reindeer is the sacrificial animal used in various rites and is regarded as a very pure animal. It also forms a major part of the diet, and the skins are used for making items such as the warmest and toughest winter clothes and boots. Even the routine slaughter of a food animal is a kind of sacrifice and is ritualized. The Nenets also believe that the reindeer connect them with supernatural forces through special “living sacrifice” animals, of which every family has a few; these are castrated reindeer bulls or *õajņs*, and they are either dedicated to a deity or are in some other way closely connected with supernatural powers. Unlike ordinary bulls, the horns of these animals are not cut, and they are very beautiful animals as they are seldom or never used as draught animals to pull the wooden sledge, called an *õaķ*, which is the only means of transportation for the Nenet in summer and winter. Reindeer are the main indicator of

prestige for the Nenet, and those with the largest and most beautiful reindeer are given more respect and have greater authority (Niglas, 1997).

The Tiger (*Panthera tigris*)

The tiger is a totemic species for the Mushahari clan of the Bodo tribe in Assam, who believe themselves to have descended from it, and for this reason the tribe has traditionally protected tigers (Gokhale, 2001). However recent political conflicts have undermined the tribe's ability to conserve it. The tiger is currently listed as Endangered on the IUCN Red List (IUCN, 2006).

The Whale

The whale is held to be a sacred animal by the Inuits of North America. For example, the people of Tikigaq, a peninsula in north-west Alaska, USA, have a myth which describes how the Tikigaq peninsula was once a whale-like creature, killed by a shamanic harpooner but which lives on, part body and part spirit, as the peninsula. When hunters took bowhead whales (*Balaena mysticetus*; IUCN listing: Lower Risk: conservation dependent; IUCN, 2006) in the spring, the whales' bodies were dismembered and stored underground to join the mythic whale's body (Lowenstein, 1993). The hunting of whales was associated with a series of rituals which extended throughout the spring and summer.

The Maoris of New Zealand also have a strong cultural affinity with the whale (Ethnic-Aotearoa, downloaded 26/02/07). In Maori myth, Tohora (whales) are the descendents of Tangaroa, the spirit of the oceans, and they were thought of in awe as supernatural beings, and were often deemed to be tapu, or sacred. Whales appear in the migration legends of many Maori tribes, sometimes acting as guides or indicating that the people should settle in a certain place. Some Maori were said to have a whale guardian spirit when at sea. In Maori art, whale designs symbolise the bounty within, and sperm whale bones and teeth (*Physeter macrocephalus*, IUCN listing: Vulnerable; IUCN, 2006) are still highly prized for carving. Nowadays these are sourced from beached whales only, and this is strictly controlled and policed by the New Zealand Department of Conservation; the protection and conservation of whales is considered paramount in New Zealand.

Birds (Class Aves)

The Dove or Pigeon

There are many species of doves and pigeons, most of which are listed as least concern, but some of which are either threatened or extinct (IUCN 2006). The dove is considered sacred by many cultures and religions. In Christianity, doves symbolise peace, new hope and the Holy Spirit.

In Gujarat, India, many communities believe that after death a person's soul assumes the form of birds and animals, so by caring for birds the people also care for the souls of their departed ancestors. They put bird-feeding tables, commonly known as chabutras (derived from kabutar, meaning 'pigeon'), in their homes and gardens, and these chabutras have become a local art form incorporating Hindu, Muslim and Jain architectural designs. As well as pigeons, the chabutras attract many other birds ranging from sparrows to peacocks (Finney, downloaded 22/02/07).

The Sacred Ibis (*Threskiornis aethiopicus*)

The Sacred Ibis was venerated by the ancient Egyptians who believed that the god Thoth sometimes came to earth in the form of the bird. Herodotus, a Greek historian and writer in the 5th century BC, noted that the secular killing of the ibis was punishable by death. The Egyptians knew that the ibis kept bilharzia (a debilitating disease) in check; this can now be explained by the ibis eating the snails which act as hosts to the bilharzia parasite. Ibis is now extinct in Egypt due to extensive swamp drainage and land reclamation, and bilharzia is rampant

(Oakland Zoo, downloaded 22-02-07). However it has been accidentally introduced to western Europe where it is considered a pest because of its predation on the nests of threatened bird species (Clergeau and Yésou, 2006). It is unclear whether this species is still venerated in some cultures.

Reptiles (Class Reptilia)

Turtles and Tortoises (Order Testudines)

The turtle is sacred to many groups, particularly in the Americas.

The Karajá people of Bananal Island, on the Araguaia River, Tocantins State, Brazil, have named four lunar months after activities of turtles, and turtles form a significant part of Karajá culture not only as an essential food source but also as subjects for their art and origination myth. The Karajá people consider six species of turtle, found in the Araguaia river: 1. kòtu/òtu (*Podocnemis unifilis*) – Vulnerable (IUCN, 2006); 2. kòtuni/òtuni (*Podocnemis expansa*); 3. kòtunini/òtunini (scientific name unknown); 4. wema (*Chelys fimbriata*); 5. kòtubuna/òtubuna (*Geochelone denticulata*) – Vulnerable (IUCN, 2006); 6. kòtubunani/òtubunani (*Geochelone carbonaria*); of these, the first two species are most important in oral and written literature. The months are named after, when the turtles lay eggs, and when the hatchlings appear and go into the water; both adult turtles and hatchlings form an important seasonal food. The Karajá people are experts on the ecology of turtles, and know detailed information on where the turtles live, what the turtles eat, how turtles choose nesting sites, and how long it takes for turtle eggs to hatch. The Karajá are also aware that the harvesting of eggs “to sell to the white man” is causing a reduction in the numbers of eggs (Fortune, 1990).

An ancient individual turtle is held to be sacred in Hanoi, Vietnam. This freshwater turtle has lived for many years in Hoan Kiem Lake in central Hanoi, and is occasionally sighted, especially from the Ngoc Son temple on the lake (Dudley et al., 2005). The species identification of this turtle is unknown, and it is possible that it is the only one of its kind. There is evidence that more than one turtle is present (CNN, downloaded 28/02/07). Turtles are symbols of wisdom in Vietnamese culture.

Amphibians (Class Amphibia)

The Frog (Order Anura)

In Japan the frog is a good luck symbol, and frogs are thought to be endowed with magical powers (Hyotan, 2005). Because of the large number of eggs that they lay, they have become a symbol of fertility, rebirth and abundance. They are a popular symbol of the Japanese people, and many people carry frog charms to ensure safe travel and the safe return of their family. Some people also put small frog images in their wallets to increase their wealth. In the countryside people believe frogs to be the gods of rainfall and good harvests.

In Native American mythology, the frog often features as Frog Woman, who is the guardian of all the fresh water in the springs and wetlands of the world (Anderson, downloaded 26/02/07). When water was readily available, Frog Woman was honoured and respected, but in times of drought, she was demonised and challenged by coyote

or some other cultural hero. Unable to get her to move, he discovered that Frog was holding the freshwaters back by weaving a basket or dam. He destroyed the basket or dam, releasing the impounded waters in a flood, and dispersing many wetland animals, which then became food for humans. The frog is also the pre-eminent Native American symbol celebrating the fecundity of wetlands, and is also associated with human pregnancy.

Fish (Class Actinopteygii)

Sacred fish pools

These can ensure the protection of numerous fish species. In the Malkangiri district of Orissa, India, there is a sacred fish pool called Amakondh, which is associated with a deity (Malhotra et al., 1998). Harvesting and bathing in the pool is strictly prohibited, however there is no monitoring or supervision of the pool and if anyone fishes there, no punishment is given, because the local people believe the deity will punish offenders. A large number of fish are found in the pool, including Rohi, Kuishari, Buttu and Lona (scientific names not given), and some fish weigh more than 5-6kg. It is also reported that the protection of the sacred pool has preserved aquatic life downstream.

The Cui-ui Lakesucker Fish (*Chasmistes cujus*)

This fish is listed as Critically Endangered (IUCN, 2006); it is found only in Pyramid Lake and associated river systems, Nevada, USA, and was once one of the main foods of the Paiute Tribe, who call themselves Cuyui Ticutta, which means the “Cui-ui Eaters”. The combined conservation efforts of the Paiute people and the US Fish and Wildlife Service have resulted in a fish hatchery to rear this fish, so that when water levels in the Truckee River are too low to support spawning, hatchery reared fingerlings can be released to produce a viable year-class (Pyramid Lake Fisheries, 2000).

The Lake Sturgeon (*Acipenser fulvescens*)

The sturgeon is held sacred by the Menominee tribal people of Keshena, Wisconsin, USA, who traditionally relied on its upstream migration to provide food when their winter supplies were coming to an end (Jones, 2006). More than a hundred years ago, the sturgeon stopped arriving because of a dam placed downstream which blocked its migration. In recent years, Wisconsin Department of Natural Resources wardens have annually presented 15 sturgeons to the tribe, in order that they can complete their traditional ceremonies associated with the sturgeon. The sturgeon must be of a certain

size, and are almost always male so as not to remove gravid females before they spawn.

Insects (Class Insecta)

Bees (Superfamily Apoidea)

Bees have been regarded from antiquity as especially endowed with wisdom and sensitivity and hence worthy of veneration, and have been domesticated for millennia (Lawrence, 1993).

The bee is regarded as sacred by many Christians; Christ has been symbolized as a honeybee, and beeswax holds a special place in religious observances. In some areas, Mass cannot be celebrated without beeswax candles providing light for the altar, due to the blessed nature of the bees that drew their origin from paradise. Wax candles symbolize the virginal body of Christ, the wick signifies the soul and immortality of Christ, and the light represents his divine person.

In Poland, the bee is honoured because it is Melissa, the Mother in Bee Goddess from ancient times; the linden tree (*Tilia cordata*) which is the favourite nesting site of the bees, is also sacred, and the month of July is named after the linden tree in Polish (Zaduszki, downloaded 26/02/07). Beeswax is used in the making of pisanki (decorated eggs given at Easter) (Grochowska-Kiefer, downloaded 26/02/07) and in 'thunder candles' which are allowed to burn all night before an image of the Virgin Mary on the night of Candlemas (Fisheaters, downloaded 26/02/07).

Beetles

Formerly of immense importance to the Egyptians, scarab beetles continue to be regarded as sacred by some peoples. Certain tribes in central Australia use a small scarab beetle (*uchalka*) and a longhorn beetle (*idnimita*) of the family *Cerambycidae* as totems (Ratcliffe, 1990). Spencer (1928) noted that the totem animal was eaten as part of fertility ceremonies; if the totem animal was not eaten there was a danger that the insect would not subsequently occur in sufficient numbers to be used as food.

Fireflies (Family Lampiridae)

Fireflies are regarded as the spirits of departed heroes by the Degar (previously known as Montagnard) people of the central highlands of Vietnam (Sax, 2001).

Social Wasps

The relationship between the Bribri people of Costa Rica and social wasps has been examined by Starr and Bozzoli de Wille (1990), who found that social insects featured in several legends, being referred to as originally human or like humans with many human-like qualities, such as their labour, nest-building activity, fixed residency, hunting activities and fierceness with which they defend their colonies. The Bribri encourage wasp-like personality traits in their children by binding up a wasp in cotton and tying it to the back of a pregnant woman for one night; the baby will then grow up to build his house well, to be fierce and to be feared by people. A distinction is made between insects that sting, and those that do not. Several species are recognised, including *Polistes erythrocephalus* known as SikwabkuLe, *Polybia simillima* known as AkbukuLe, *Agelaia areata* known as KaköbukuLe, *A. myrmecophila* known as BöbukuLe, *Metapolybia* spp. known as KàlbukuLe, *Synoeca septentrionalis* known as Tswíbkule and *Paraponera clavata* known as Siámña. *S. septentrionalis* is said to have originally been human and is now associated with the shaman profession. Apprentice shamans pay close attention to it because it knows the whereabouts and uses of medicinal plants, and the firewood used in their initiation ceremony is taken from a tree in which the wasp is nesting. On his initiation one young shaman was brought a nest of this wasp to mark his new authority and the respect due to him and his house.

The Termite (Order Isoptera, more than 2000 species known)

Anthill (or termite mound) worship is an ancient cult that is surviving in many parts of India. Irwin (1982) has written extensively about this cult, as summarized here. The cult once occupied a central place in Vedic and Hindu religion and embraces all the events of human life, including birth, marriage, sickness and death. Anthills have also been associated with the consecration of temples, the warding-off of evil, the ritual destruction of enemies, calling divine witness and securing material prosperity. Anthill shrines are now concentrated mainly in southern India but they were once common throughout India.

The sacred anthill is often identified with a village goddess who is considered to have been born of the anthill and to be one with the anthill. Anthill worship takes the form of ritual clock-wise circumambulation and the giving of offerings, especially bananas, eggs, rice and milk; animal sacrifice also occurs, with the blood being poured down the ventilation shafts of the mound. The mounds are also often garlanded with flowers.

Anthill festivals are associated with the new year (as defined by local calendars and crop cycles, occurring more than once within our twelve months). The festivals are non-sectarian and attract local tribes along with Vaisnavas and Saivates; officiating priests are non-Brahmins. At some shrines, worshipers take off their clothes and wear a leaf-dress made from the margosa or nim tree (*Azadirachta indica*), a sacred tree which is also widely worshipped in India. The ventilation shafts of the mound are believed to lead down into the netherworld, so that the mounds are used to make sacrifices to the ancestors. The mounds are also associated with fertility, because of the termites' capacity to reproduce very rapidly.

The mounds are often inhabited by cobras (family Elapidae, several genera), who like the humid environment. Local folklore says that the mounds contain a treasure which is guarded by a serpent, leading some to classify the anthill cult as a form of snake worship, which is what it has become in some areas. At the foot of many termite mounds a statue of Nagesvari, Lord of the serpents, may be found.

The attention given to termite mounds is not always beneficial to the termites and resident snake, who sometimes leave; perhaps the ducts become clogged up with offerings or the food left near the mounds is inappropriate for the termites. If there are no termites left, people may build walls and a roof over the mound to prevent it being washed away by rains, or they may move their attention to other mounds.

A similar reverence of termites can also be found in parts of Africa (Fairhead and Leach, 1999). Where termite mounds are found at water sources or beside swamps or rivers, they are often shrines to the perennial nature of water flow, and prayers and sacrifices are offered to ensure it. Farmers choose land with termite mounds as it is believed to be less dry than other land nearby, and if a termite mound is near a boundary between two farmers' lands, the boundary is shifted so that the termite mound falls half on each side of the boundary, so that both farmers gain the benefits.

4. SACRED PLANTS (Kingdom Plantae)

Conifers (Class Coniferopsida)

The Cypress Tree (Family Cupressaceae)

The Lawson false cypress, *Chamaecyparis lawsoniana*, is important in the ceremony and ritual of native North Americans; for example, after smudging the ceremonial area with sage to cleanse and purify it, the smoke of the Lawson false cypress is used to “call in the spirits”. Indigenous peoples of eastern Canada use the Western red cedar (*Thuja plicata*) to make their totem poles (Hageneder, 2005).

The cypress is often used to mark the resting place of departed friends in Muslim, Armenian, Christian and Jewish cemeteries, and in Turkey a cypress is always placed at the end of the grave, resulting in some cemeteries having the appearance of a grove or forest of cypresses (Baker, 1974). Its evergreen leaves are symbolic of resurrection or the everliving, and branches of cypress are frequently used to make wreaths (Baker, 1974; Hageneder, 2005).

In Japan, the sugi (*Cryptomeria japonica*) is often found in Buddhist temples and Shinto shrines. An old tradition in Japan is shinrinyoku or forest bathing, which involves bathing in the fresh and healing air of the forest; the two trees praised for making the air beneficial are sugi and hinoki (*Chamaecyparis obtusa*), a relative of the Lawson false cypress (Hageneder, 2005).

The Sacred Fir Tree (*Abies religiosa*, Family Pinaceae)

The sacred fir is native to the mountains of central and southern Mexico and western Guatemala. It gets its name from the use of its cut foliage in religious festivals, especially at Christmas (Liu, 1971).

The Yew Tree (*Taxus baccata*, Family Taxaceae)

Traditionally the most sacred of trees throughout much of Europe, the yew is still found throughout the churchyards of Britain. Its presence often reflects earlier pre-Christian beliefs, and some yews are several thousand years old, predating both the churches and even ancient shrines such as Stonehenge. It is still recognised as sacred by many today. However it has been estimated that more than half the ancient yews in the UK

have been lost over the last century, partly due to storm damage and partly because people have forgotten that what appears to be a decaying rotten yew tree will continue to grow from the 'aerial roots' (so-called when a branch grows towards the ground and takes root) and root suckers (Hageneder, 2000; Soutter et al., 2003; Hageneder, 2005).

The Ginkgo (Class Ginkgoopsida)

The Ginkgo or Maidenhair Tree (*Ginkgo biloba*, Family Ginkgoaceae)

The Ginkgo is a sacred tree in Asia, which is often planted near Taoist and Buddhist temples (Hageneder, 2005). It is listed as Endangered in its native range in the IUCN Red List (IUCN, 2006) but it is widely cultivated in Asia, Europe and North America as it survives well in polluted cities. It has come to be regarded as the "bearer of hope" in Japan, after the exceptional survival of four ginkgo trees near the epicentre of the atom bomb explosion in Hiroshima, where all else was destroyed; today there are plaques near some of these trees bearing prayers for world peace (Hageneder, 2005).

Monocotyledons (Class Liliopsida)

The Date Palm Tree (*Phoenix dactylifera*, Family Palmae)

This tree is honoured in the Islamic tradition; Muhammed taught "Honour the date-palm, for it is your aunt on your father's side; it is made of the same stuff as Adam, and it is the only tree that is artificially fructified" (Baker, 1974).

In Jewish history, the palm became a symbol of justice and righteousness, associated with Deborah, a wise and powerful prophetess and judge whose custom it was to sit under the palm tree. Palm fronds are used to make the ceremonial booths for the Feast of Tabernacles (Hageneder, 2005).

In Christianity, Palm Sunday (the Sunday before Easter) celebrates when Jesus rode into Jerusalem and the people waved palm fronds and laid palm leaves before him to celebrate his coming (Baker, 1974).

The Golden Lotus Dwarf Banana (*Musella lasiocarpa*, Family Musaceae)

The Golden Lotus Dwarf Banana (*Musella lasiocarpa*) is a dwarf banana species endemic to the South West Yunnan province in China (Nature Products, 2000), and is held to be the most precious of sacred flowers by the Dai and Bulang Buddhist ethnic minorities of this province. It is actively cultivated but is believed to be extinct in the wild (Worldwide Orchids, 2003); it is not currently listed in the IUCN Red List. Its sacred status has not protected it from being harvested for food for people and livestock during harsh times. Seeds from a plant found in the grounds of a monastery are currently being used to propagate this species for international trade (Nature Products, 2000).

Rice (*Oryza sativa* and *Oryza glaberrima*, Family Poaceae)

Many Asian cultures believe that rice is a sacred food given to humans, which sustains our bodies in a way no other food can. In Japan, one third of all Shinto shrines are dedicated to Inari, the deity of rice (Hamilton, 2004). Rice often represents the female aspect and is sometimes treated like a pregnant woman. For example, people in Ambon, Indonesia, avoid making loud noises near rice fields in bloom, for fear the crop will become all straw and no grain (Frazer, 1922).

Taro (*Colocasia esculenta*, Family Araceae)

In Hawaii, Taro is a sacred plant believed to have given rise to the first Hawaiians (Science, 2006). When Walter Ritte, a Hawaiian fish farmer, discovered that researchers at the University of Manoa, Hawaii were patenting genetically modified forms of taro, he started a campaign against the university which resulted in it giving up the patents.

Dicotyledons (Class Magnoliopsida)

The Acacia Tree (*Acacia* spp., Family Leguminosae)

This tree is revered in Arab lands, and anyone who even breaks a twig is expected to die within a year (Hageneder, 2005).

The Almond Tree (*Amygdalus* spp., Family Rosaceae)

In Judaism a divine light is said to shine mystically from the almond tree, and this tree has come to be celebrated as the Tree of Light, which is ritually represented by the menorah, the candlestick that has a light for each of the seven planets. In rabbinic legend, there exists a paradise city whose only entrance can be found 'in a hole in an almond tree' and in that place, 'the angel of death has no power' (Hageneder, 2005).

In the Bible, the staff of Moses was made of almond wood, and later, the "shepherd staffs" of Christian patriarchs followed this tradition. Today the Pope and bishops still carry a crosier, although it is no longer traditionally made of almond wood.

The Banyan Tree (*Ficus bengalensis*, Family Moraceae)

The banyan is sacred to many peoples in India, Pakistan, China and southeast Asia. In Hinduism it is regarded as the abode of divine presence, and in the Vedas and the Upanishads, trees (and particularly the banyan) are linked with Brahma, the immortal, innermost spirit of the universe. The banyan also features in the Bhagavad Gita, which states "There is a banyan tree which has its roots upward and its branches down, and whose leaves are the Vedic hymns. One who know this tree is the knower of the Vedas."

The banyan tree is also important in Buddhism: while the Buddha attained enlightenment under the pipal tree, Kasyapa (one of the Buddha's followers who became a bodhisattva) is pictured as attaining enlightenment under the banyan, as depicted in the Stupa of Barhut, which was originally located in Madhya Pradesh, India, and is now held in the Kolkata Museum (Hageneder, 2005).

Banisteriopsis spp. and *Terapteris methystica* (Family Malpighiaceae)

Banisteriopsis caapi, *B. inebrians*, *B. rusbyana* and the related *Terapteris methystica* are used by tribes in the western Amazon of Brazil, Bolivia, Colombia, Ecuador, Peru and in the Orinoco headwaters in Venezuela and the Pacific coast of Colombia to produce a psychotomimetic decoction or infusion known as ayahuasca, caapi, natema, pinde or yajé, causing colour visions and synesthesia, and often used in ceremonies involving dancing. These plants are used for divination, prophecy, diagnosis and

treatment of diseases, communication with ancestors, preparation for war and male adolescent rites. Some Amazonian peoples treat these plants as a sacred, almost deified element.

In a recent case, the U.S. Patent and Trademark Office withdrew a 13-year old patent held on a variety of *B. caapi* by a California-based plant researcher who claimed to have cultivated a unique pink-flowered specimen which he intended to exploit for medicinal purposes, after a petition from the Centre for International Environmental Law on behalf of a coalition of Amazon Indians (Science, 1999).

Cannabis (*Cannabis sativa*, Family Cannabaceae)

Native to central Asia, cannabis is a source of hemp fibre, seed oil and is a well-known narcotic. In parts of Africa it plays an important role in religion and magic. In India it has assumed a religious significance, and it is here that races have been selected with the highest concentrations of its active ingredient, tetrahydrocannabinol (Schultes, 1969). In the ancient Atharva-Veda it is called a 'liberator of sin' and a 'heavenly guide' and it is still used in temples as a sacred plant. Three forms are used in India: bhang, where it is dried and added to drinks such as water or milk; ganja, where it is smoked with tobacco; and charas, the pure resin which can also be smoked.

Christ's Thorn Jujube Tree (*Ziziphus spina-christi*, Family Rhamnaceae)

This tree is the only tree species considered holy by Muslims (Dafni et al., 2005). It is mentioned twice in the Qur'an, and all the individuals of the species are sanctified. It features in an old Muslim legend which tells of a Christ's Thorn Jujube that grows in Paradise and has as many leaves as there are human beings. Each leaf bears the name of a person and his or her parents. Every year on a particular day the tree is shaken, and leaves which fall off indicate that that person will die in the coming year. Another story relates how the fruit of the Christ's Thorn Jujube tree was eaten by Muslim fighters of the early Islamic period, and therefore the tree is honoured and may not be uprooted.

In Israel it is said by Muslims that when the tree reaches its 40th year, the saints sit under it. The saints will destroy anyone who dares to cut down the tree or one of its branches. In Iraq special honour is given to Christ's Thorn Jujube; it is believed that if a man cuts down a tree, he will soon fall ill and die.

Christ's thorn also has a special status as a blessed tree among the Druze (a religious community based mainly in the Middle East and an offshoot of Islam). Dafni et al. (2005) review the history and many associations of this tree in the Middle East.

Datura (*Datura* spp., Family Solanaceae)

Datura species have been revered as sacred visionary plants by most cultures who have come into contact with them (Leda, 2001). There are many different species in the genus (e.g. *D. ceratocaula*, *D. ferox*, *D. innoxia*, *D. metel*, *D. quercifolia*, *D. stramonium*, *D. tatula*, *D. wrightii*, *D. discolor*, *D. alba*, *D. fastuosa*) and the closely related *Brugmansia* spp. are also regarded and used in similar ways to *Datura* spp. They are distributed throughout all warm and tropical regions of the world. *Datura* can be taken medicinally as a painkiller or used to make an ointment for ulcers, infected wounds and skin sores, but is better known for its use as a hallucinogen. It is used to divine the outcome of future events, discover the whereabouts of lost or stolen objects, and to discern the causes of diseases.

In the Andes *datura* is known as *chamico* and is taken as a tea or smoked to induce visions (Leda, 2001). Amongst the Yaqui of Mexico *D. innoxia* is used by shamans as an 'ally'; the shaman should cultivate his own patch of the plant, and it is considered to have feminine qualities and to give power (Castaneda, 1968).

The Kamsá of Sibundoy in the Colombian Andes use several *datura* species and numerous named clones which have been propagated and are so highly atrophied that they may represent incipient varieties (Schultes, 1969). The different varieties differ in their narcotic strength, and are valued by witch doctors for different purposes. One arborescent variety has been described as a distinct genus *Methysticodendron amesianum* (this is still open to debate); known locally as *culebra borrachera*, it is apparently endemic to the high Sibundoy Valley, and is reported by the Kamsá to be far more potent than *datura* (Schultes, 1969).

The Eucalyptus Tree (*Eucalyptus* spp., Family Myrtaceae)

There are more than 400 species of eucalyptus, mainly native to Australia. They are amongst the most sacred trees of the aboriginal tribes, but without these tribes' permission it is not possible to quote them. One sacred use which is well-known is the didgeridoo, a musical instrument made when termites hollow out a eucalyptus branch; the instrument is used in ceremonies to mimic the natural noises made by birds and animals. However the worldwide interest in the didgeridoo has resulted in a market which is threatening some eucalyptus stands (Hageneder, 2005). Two eucalyptus species are listed as threatened on the IUCN Red List: *E. morrisbyi* is Endangered, and *E. recurva* is Critically Endangered (IUCN, 2006).

Holy Basil (*Ocimum sanctum*, Family Lamiaceae)

In India holy basil, known as kovil tulsi, is one of the sacred herbs which is grown in houses and temples. It has a long history of medicinal use and is mentioned in ancient Ayurvedic texts such as Charak Samhita (Wohlmuth, downloaded 03/03/07).

The Kapok Tree (*Ceiba pentandra*, Family Bombacaceae / Malvaceae)

Kapok is native to the central part of the Americas, and is sacred to many of the indigenous peoples there. The Huarorani tribe of the Amazon basin consider it to be their creation tree (Soutter et al., 2003). In the villages of the Manjak people of Guinea Bissau, it marks the central open place or benii. The spirits of the nearby shrine are said to live in the Kapok trees. Important rituals are performed here, and it is the village's major burial ground (van Binsbergen, 1984).

The Lotus (*Nelumbo nucifera*, Family Proteales)

Common names for *Nelumbo nucifera* include the blue lotus, Indian lotus, sacred lotus, bean of India, and sacred water-lily. It was sacred to the Egyptians in ancient times, and features centrally in both Hinduism and Buddhism.

In Hinduism, it is associated with Brahma, and features in the creation story: when the universe was created from the cosmic waters, a lotus issued from the navel centre of the god Vishnu who was reclining on the serpent, Ananta. The lotus opened and gave birth to the creator, Brahma, who then created the universe. The lotus is a symbol of the Absolute, sustaining the phenomenal world (Ward, 1952). The lotus flower's shape also symbolizes the chakras, or energy centres, within the human body.

In Buddhism, the Buddha is often depicted sitting in the middle of a lotus flower, and the lotus has a meaning of purity. It grows in the mud, but pushes its blossom through the murky waters to bloom above the water; its clean white colour comes out from the mud of the earth but does not touch it (Ward, 1952). It is cultivated in ponds in Buddhist monasteries.

Most parts of the plant are edible and it is also used ornamentally throughout much of Asia.

Mimosa hostilis (Family Leguminaceae)

Called yurema, this hallucinogen is used by the Karirí, Pankararú and other Indians of eastern Brazil. It forms the centre of a cult which uses an infusion of the root to bring on glorious visions of the spirit world.

The Neem Tree (*Azadirachta indica*, Family Meliaceae)

The neem tree, also known as nimba, is a manifestation of the Mother Goddess Kali or Durga. It is worshipped most intensely in southern India where a few very rich families control the production of neem oil. Tamil women who worship the goddess Kali wear red, carry branches of neem and dance in public places, swishing the branches as an act of exorcism to purify the world. Neem is hung over doors to keep evil spirits out (Neem Worship, downloaded 03/03/07). The Neem is also associated with the goddess Sitala, who is supposed to occupy it and who is the goddess of disease. In this aspect it is worshipped mainly by women and children, who make offerings with incense at the base of the tree to protect themselves from disease (Upadhyaya, 1967).

The Oak Tree (*Quercus robur*, Family Fagaceae)

The oak traditionally supplied the yule log for the midwinter festival at the close of the old year and the start of the new in many European countries. Solitary trees in agricultural meadows were untouchable, and many can still be seen in the British landscape. The church superimposed saints on some of these trees, particularly Mary; in Germany, some Oaks of Mary remain in Bavaria (Hageneder, 2000).

The oak features strongly in British myths. King Arthur's round table was believed to have been made from a single piece of oak, and Merlin's oak still exists in Carmarthen, Wales (Hageneder, 2000).

The oak brings the raw life energy and inspiration, and was the Celtic tree of the warrior (Hageneder, 2000). It is a symbol of unity, strength and longevity in the bible (Baker, 1974).

The Olive Tree (*Olea* spp., Family Oleaceae)

The olive tree has a long history of association with the Jewish people, who regard it as having religious significance, and the olive was treated as sacred throughout the Jewish dispersal (Baker, 1974). Olive oil is the traditional fuel used in the Jewish seven-branched candlestick, the menorah, which represents the tree of light (Hagender, 2005).

The Roman Catholic Church still consecrates the Oil of the Catechumans, the holy oil used in the sacrament of baptism which must be sanctified by the bishop of the diocese, with olive oil as a key ingredient. Indeed Christos is Greek for 'the Anointed One' (Hageneder, 2005).

In many countries, it is a recognised symbol of peace. In China, when one wishes to settle a quarrel, one sends one's enemy an olive and a piece of red paper (Baker, 1974). In the bible, after the great flood the dove brings Noah an olive leaf as a sign that the waters are receding.

Peyote (*Lophophora williamsii* and other related species, Family Cactaceae)

Peyote is a cactus containing the psychoactive substance, mescaline (Gottlieb, 1977). It grows wild from Central Mexico to north Texas where it has been traditionally used by the Cora, Huichol, Tarahumare and Yaqui amongst others (Castaneda, 1968; Schultes, 1969). Over the past two centuries the religious use of peyote has spread northward into the United States and Canada among many of the Plains Indian Tribes such as the Navajo, Comanche, Sioux and Kiowa, and is used by the Native American Church (Schultes, 1969; Gottlieb, 1977). It has come to replace the hallucinogenic but dangerous red mescal bean (*Sophora secundiflora*) as a ceremonial sacrament. Yaqui shamans ('men of knowledge') relate the use of peyote to the acquisition of wisdom, or the knowledge of the right way to live; this is achieved through the 'states of non-ordinary reality' which arise from taking Mescalito, the name associated with peyote (Castaneda, 1969).

To prepare mescal buttons, the small chlorophyllous crown is sliced off and dried to form hard brownish buttons which keep indefinitely; these buttons are eaten by softening them in the mouth and then swallowing them directly without chewing (Schultes, 1969). Peyote also has healing properties: Huichol Indians rub fresh peyote juice into wounds to prevent infection and aid healing, and is used by the Tarahumara Indians to combat hunger, thirst and exhaustion while hunting.

A related species, *Lophophora diffusa*, is currently listed as Vulnerable on the IUCN Red List (IUCN 2006), with a continuing decline due to illegal harvesting (Fitz Maurice and Fitz Maurice, 2002). Although *L. diffusa* contains only trace amounts of mescaline, some people report psychoactive effects when ingested, which may be the cause of this illegal harvest.

The Pipal or Bo Tree (*Ficus religiosa*, Family Moraceae)

The Pipal or Bo Tree is native to India and southeast Asia. It is also known as the sacred fig and the Bodhi Tree (meaning “tree of awakening”), in recognition of its having been the tree under which Siddhartha Gautama sat until he reached enlightenment and became the Buddha. This occurred in Bodh Gaya approximately 2600 years ago. Since that time the tree has been sacred to all Buddhists, and is commonly planted near Buddhist temples. A descendent of the original Bodhi Tree is still alive in Bodh Gaya, and is a place of pilgrimage for many Buddhists (Starr et al., 2003; Hageneder, 2005).

The bo tree is also sacred to Hindus, who regard it as the dwelling place of the Hindu Trinity: Brahma, Vishnu and Mahesh. It has been described as the tree of creation with its roots going high up in the sky and its branches reaching the earth. It is strictly prohibited to use it as fuel. As gods live on it, it is sacrilege to harm it. In different parts of India it is associated with various rituals associated with women and paying respect to the dead (Upadhyaya, 1964).

The Plane Tree (*Platanus* spp., Family Platanaceae)

In the Near East, many revered plane trees can be found shading village springs (Hageneder, 2005).

The Sausage Tree (*Kigelia africana*, Family Bignoniaceae)

This Kenyan tree is believed to shelter communal spirits of female fertility; in the communities where this tree is sacred, it is unethical to cut it down, ensuring its conservation. If someone cuts down one of these trees, they must perform a ritual, which often entails sacrificing an animal at the place where the tree used to stand (Attiti, 2001).

Tabernanthe iboga (Family Apocynaceae)

This plant is found in the wet tropical forests of West Africa, especially of Gabon, and the yellowish roots are chewed to offset hunger and fatigue. In large doses it can cause excitement, mental confusion, and a drunken madness characterized by prophetic utterances. It has many uses in folk medicine. It is reported to induce visions and has a ceremonial role which is central to the Bwiti cult (Schultes, 1969).

The Tamarisk Tree (*Tamarix* spp., Family Tamaricaceae)

The tamarisk had sacred associations in Old Testament times, and these associations remain today among the Arab peoples, who like to sit in its shade and hear it say “Allah, Allah” in the breeze (Baker, 1974).

The Tendu Tree (*Diospyros melanoxylon*, Family Ebenaceae)

This tree is a totemic species for the Gonds of Gadchiroli district in Maharashtra, India (Gokhale, 2001).

The Terebinth Tree (*Pistacia terebinthus*, Family Anacardiaceae)

Among ancient people of the Near East, the terebinth was revered and deified. Terebinth sanctuaries were used as sites of worship, for incense-burning and as burial sites. Terebinth trees can still be found in sanctuaries along Islamic pilgrimage routes (Hageneder, 2005).

Virola spp. (Family Myristicaceae)

A hallucinogenic snuff is made from the bark resin of *Virola calophylla*, *V. calophylloidea* and *V. theiodora* in north-western Brazil and adjacent Colombia and Venezuela. Its local names include yakee, paricá, epená and nyakwana, and its use centres around the Waiká of Brazil and Venezuela. In Colombia the snuff is only taken by witch doctors, and among the Waiká, only males can take it and it is used in endocannibalistic ceremonies. Its effects include excitement, numbness of limbs, hallucinations and macroscopia; the Waiká believe that spirits are resident in the drug (Schultes, 1969).

5. MUSHROOMS (Kingdom Fungi)

Fly Agaric (*Amanita muscaria*, Family Amanitaceae)

This toxic mushroom traditionally used by Europeans to kill flies is also a hallucinogen, used in the extreme west of Siberia among Finno-Ugria peoples, the Khanty (Ostyak) and Mansi (Vogul) and in the extreme north-east of Siberia among the Chukchi, Koryak and Itelmen (Kamchadal) peoples (Schultes, 1969). Several mushrooms are used as extracts in cold or warm water or milk, either alone or with the juice of the northern bilberry (*Vaccinium uliginosum*) or fireweed / rosebay willow herb (*Epilobium angustifolium*). The effects include twitching and trembling of limbs, good humour, light euphoria characterised by macroscopia, visions of the supernatural and illusions of grandeur; there may also be religious overtones, such as an urge to confess sins. This is possibly the soma brought to India by the Aryans and described in the Rig Veda.

Haploporus odorus (Division Basidiomycota)

This bracket fungus is sacred amongst the northern plains tribes of North America, for example among the Blackfoot tribe. It was traditionally used to ornament sacred robes and necklaces, as a component of medicine bundles, to protect against illness and as a symbol of spiritual power. The sporophores have a fragrant anise-like scent (Blanchette, 1997).

Psilocybe, Panaeolus, Stropharia and Conocybe spp. (Order Agaricales)

Various mushrooms are used in southern Mexico to induce hallucinogenic or mystical experiences; approximately 20 species of mushrooms are used among 9 tribes, including *Psilocybe* spp., *Panaeolus* spp., *Conocybe* spp. and *Stropharia* spp., with *Psilocybe mexicana* being the most important (Schultes, 1969). Castaneda (1968) refers to *Psilocybe* mushrooms as an “ally”, called humito meaning “little smoke”; they are smoked in order to induce experiences used in Yaqui shamanistic rituals in Mexico.

6. RECOMMENDATIONS AND CONCLUSIONS

A selective approach in reviewing the vast literature available on this topic has been chosen due to time and resources constraints. Further work will certainly bring to light many more species which hold sacredness. A number of additional sources of information have been already located and further funding is required to collate and present this information.

This brief research has however already shown a few concerns. Consumptive, for example, is not precisely a distinguished issue within the sacredness of species. Rice, in fact, is a sacred food. In Japan several Shinto shrines are dedicated to the deity of rice, and therefore rice has been considered in this literature review as a sacred plant.

Vast information used for the research, in addition, comes from humanities and social sciences. Most of it, especially sources in books, is historical, with only a small part of it referring to present times. Moreover, very little of the information is directly linked with nature conservation. However it is often clear that the way people behave towards species will aid their conservation. Furthermore, if further investigation is carried out, it could bring to light other elements to support biodiversity conservation.

Ways that sacredness could further conservation

Most of the plants have been cultivated or intentionally grown; a few of the animals are kept in captivity or encouraged to breed, but most of them live only in the wild. Among the species of the review, it was very rare that human use was causing the destruction of a species, and therefore the human impact has been revealed as being low.

Because of people's greater awareness of sacred species and their often extensive knowledge on the species' habitat and ecology, it is considered unlikely that they will behave in ways which are destructive to the species, and they will probably notice quickly if the species starts to decline. Generally, the human impact on the environment is in these cases either neutral or positive.

Directions for further research on Sacred Species

It is proposed a second stage in the research on sacred species in order to broaden the scope of the literature review, both in terms of the number of species covered and the information given about the role of each species within the culture or belief systems, and how this affects human behaviour toward the species. Such information was often available only in papers or books which were not readily available, but could be obtained from appropriate libraries. This more detailed information is particularly relevant to understanding the potential role of sacredness in the protection and conservation of species.

In this second stage of the research, it is also hoped to incorporate information provided by numerous people around the world who have shown an interest in the topic. Many of these people are connected with the IUCN Species Survival Commission, and are willing to contribute in the subject with their expertise and knowledge.

A further area to explore is taboo species, as well as species which have specific human behaviours related with them but which are not labelled as either sacred or taboo. While behavioural taboos are associated with many sacred species, some species may be considered taboo for quite the opposite reason e.g. they may be considered evil and therefore should be avoided or should not be disturbed. Other species moreover may be considered unclean, and consequently will be safe from harvesting.

In conclusion, to cover the existing gaps it is proposed to fundraising and preparing project proposals under the cultural support and the partnership of IUCN. This will enable us to carry out further research with the aim of increasing the scope and level of detail.

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