

A Review of Conservation Legislation in Nepal: Past Progress and Future Needs

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ABSTRACT / Nepal is considered a leader among developing nations with regard to conservation legislation and programs; it was among the first Asian nations to develop national conservation legislation, sign CITES, and develop a national conservation strategy. We review the history of modern conservation law in Nepal from the Rana period (early 1950s) to the present. The early legislation focused mainly on strict preservation of areas and species; this phase culminated in the National Parks and Wildlife Conservation Act of 1973. Subsequent legislation has evolved more in the direction of an integrated, holistic approach to conservation and is beginning to incorporate the participation of local people; subsequent amendments

to the 1973 act allowed greater rights to rural villagers, and the designation of conservation areas in addition to the more strictly defined protected areas (national parks, wildlife reserves, etc.).

Our review of conservation legislation suggests that Nepal has had many successes to date; the country has a protected area system covering over 10% of its land area, and many target species are recovering in parks and reserves. There are also some causes of concern, including staff shortages, financial constraints within the Department of National Parks and Wildlife Conservation, and the fact that there is little legal infrastructure outside of protected areas to enforce conservation laws; further, some aspects of hunting regulations are in need of revision. Primary needs include a comprehensive review of these policies and a nationalized strategy to ameliorate the shortcomings.

Known for its natural beauty and expansive geography ranging from subtropical lowland forests to the highest peak on earth, His Majesty's Government of Nepal (HMG) has been a leader among the least developed countries (LDCs) for its commitment to conservation. The country's status as a densely populated LDC, combined with a wealth of biological diversity inherent to regions in low latitudes with great geographic diversity, lead to particularly complex conservation problems, and therefore rather complex legislative solutions. In this article, we explore the recent history of conservation law and practice in Nepal with a review of the history of policy and legislation from 1957 to the present. We also present insights into the workings of the Department of National Parks and Wildlife Conservation and the King Mahendra Trust for Nature Conservation, the governmental and non-governmental agencies responsible for conservation activities in the country.

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This is the first time that many of the amendments to the National Parks and Wildlife Conservation Act 2029 (1973) have been translated and reviewed in English. We have used a variety of sources here because much of the information is unavailable in reviewed outlets; our sources include HMG documents, United Nations technical documents, internal reports of the Department of National Parks and Wildlife Conservation (DNPWC) and various international development agencies, and published accounts. Many individual wardens also supplied their assessments of managerial problems and legal constraints to conservation practices in Nepal, sometimes anonymously. Our purpose is to present a brief review of the recent history of conservation legislation in the country and discuss what we perceive to be the strengths and weaknesses of the legislation in the changing political and economic climate of Nepal.

An Historical Perspective

The recent political history of Nepal has been discussed by Bhatta (1987) and Bista (1991). Brief histories of conservation programs during the time period from the 1950s to 1973 have been presented by Shrestha (1981), Gurung (1983), and Majapuria (1981). Here we provide some of the main points,

historically, which led to the passage of the 1973 National Parks and Wildlife Conservation Act.

The era of modern conservation in Nepal began in the 1950s, with the overthrow of the Rana regime, the former hereditary prime ministers, and the restoration of the monarchy. The late King Mahendra, the father of the current monarch, assumed the throne in the mid-1950s, and the first wildlife law was published in Nepal in 1957 (HMG 1973, 1977a). This law offered legal protection to rhinos and their habitat. In 1964, a rhino sanctuary was declared by royal decree in part of what is now Royal Chitwan National Park, and a special guard force, the Gaida Gasti (Rhino Patrol), was also created that year. The Gaida Gasti is still in existence to patrol areas adjacent to but outside the boundaries of Chitwan National Park. This time period coincided with the malaria eradication program, financed by the World Health Organization (WHO) and the United States Agency for International Development (USAID), with the aim of eliminating malaria from the Terai: the sparsely inhabited Nepali lowlands. Malaria eradication brought mass migration of people in need of land from the densely populated middle hills of Nepal and the plains of India. This was followed by rapid rates of forest clearance in the formerly vast sal (*Shorea robusta*) forests, and the concomitant decline of wildlife populations in Chitwan Valley, formerly a royal hunting reserve, thus providing the impetus for King Mahendra's conservation decrees.

By the late 1960s, King Mahendra supported the beginning of a long-term wildlife project to address conservation issues in the entire country, with the help of the Food and Agriculture Organization (FAO) of the United Nations, and the United Nations Development Program (UNDP). The first FAO/UNDP involvement in wildlife conservation in Nepal began in 1968, with the Trisuli Watershed Project, a joint venture that employed one biologist who surveyed areas and made recommendations about the need for wildlife protection in the country (Caughly 1969). These recommendations, as well as the growing concern about declining wildlife populations, led HMG to request another foreign advisor from 1970 to 1973 who did preliminary surveys in some areas (Blower 1971), and subsequently the HMG/FAO/UNDP National Parks and Wildlife Conservation Project began in 1973 (UNDP/FAO 1973). The broad goals of this project included the effective management and conservation of wildlife and their habitats in the kingdom, the development of a national park and reserve system, and the development of the Department of National Parks and Wildlife Conservation, formerly

an office administratively under the Department of Forestry. Many of Nepal's existing parks and reserves and several important wildlife populations were first surveyed under this project (e.g., Bolton 1975, 1976a,b, Wegge 1976a,b, Lehmkuhl 1977, Dahmer 1978, Dinerstein 1979, Kattel 1980, 1981), and the project provided scholarships for many Nepali nationals to study natural resource management abroad, mostly in the United States. The project was extended and lasted a total of almost six years, ending in July 1979 (UNDP/FAO 1980). Probably the major accomplishment of the project was its role in the implementation of the National Park and Wildlife Conservation Act 2029 (1973), which has affected all subsequent conservation activities in the country.

The National Park and Wildlife Conservation Act 2029 (1973)

The 1973 act contained 34 sections and provided broad legislation for the protection of areas and species in Nepal (HMG 1973, 1977a). The purpose of this section is to present main topics covered in the act; subsequent amendments and regulations are discussed later.

Section 2 of the Act described four different types of reserves, and provided the DNPWC with the legal power to create these reserves. The reserves are defined in Nepali legislation as follows:

National Park. An area set aside for conservation, management, and utilization of mammals, birds, vegetation, and landscape together with the natural environment.

Controlled (Strict) Nature Reserve. An area of ecological significance or significant in other respects, set aside for scientific study.

Wildlife Reserve. An area set aside for the conservation and management of mammals, birds, and other resources and their habitat.

Hunting Reserve. An area set aside for conservation and management of birds and mammals and other resources to provide hunting to hunters.

The first three categories correspond approximately to the International Union for the Conservation of Nature and Natural Resources (IUCN) categories II, I, and IV, respectively (IUCN 1990). Hunting reserves as defined above are not recognized by IUCN, but the broad goals of hunting reserves as managed in Nepal (e.g., Wegge 1976a,b, Sharma 1982) correspond approximately to those of IUCN category VIII. The act empowers HMG to create these four types of reserves and to transfer ownership for the purposes of declaring parks and reserves. In

Table 1. The national parks and reserves of Nepal^a

Name	Location	Size (sq km)	Date established
Kosi Tappu WR	Eastern Terai	175	1976
Paras WR	Central Terai	500	1984
Royal Chitwan NP	Central Terai	932	1973
Royal Bardia NP	Mid-west Terai	968	1976
Sukla Phanta WR	Far west Terai	155	1976
Shivapuri WR	Kathmandu Valley	114	1985
Khaptad NP	Far west Hills	225	1985
Makalu-Barun	Eastern Himalaya	2330	pending
Sagarmatha NP (Mt. Everest)	Eastern Himalaya	1148	1976
Langtang NP	Central Himalaya	1710	1976
Annapurna CA	Western Himalaya	3400	1988
Dhor Patan HR	Mid-west Himalaya	1325	1984
Rara NP	Mid-west Himalaya	106	1976
Shey Phoksundo NP (Dolpa)	Mid-west Himalaya	3555	1984
Total area:		16,643	

^aThe abbreviations used are: wildlife reserve, WR; national park, NP; hunting reserve, HR; and conservation area, CA.

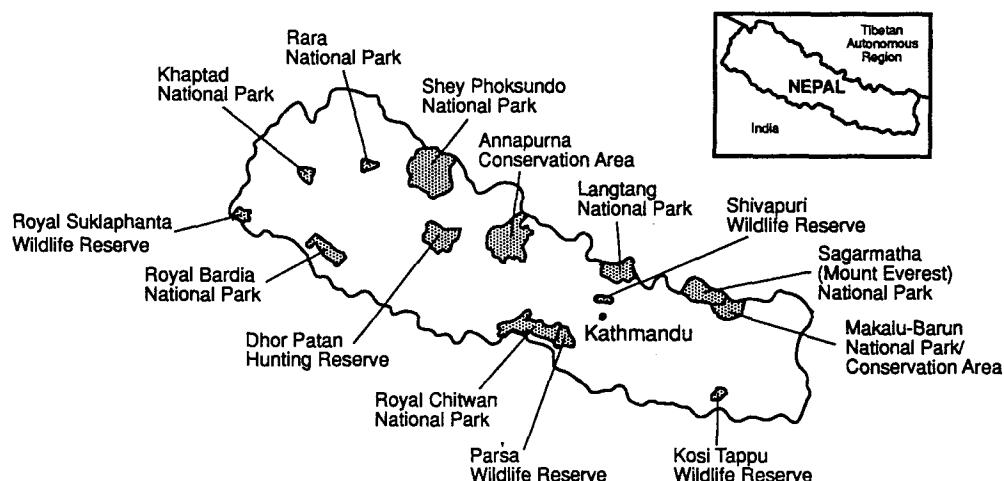


Figure 1. Protected areas of Nepal.

addition, a subsequent amendment allowed for the creation of a fifth type of reserve (see below). Nepal currently has 12 protected areas under the jurisdiction of the DNPWC, and another one is pending (Makalu-Barun) (Shrestha and others 1990); one additional reserve (Annapurna) is under the jurisdiction of the King Mahendra Trust for Nature Conservation. (See Table 1 and Figure 1.)

Sections 4 and 5 of the act allowed entry into national parks and wildlife reserves with an entry permit and prohibited various activities such as hunting, land clearing, and grazing livestock inside of national parks and wildlife reserves. Sections 7 and 8 allowed entry into strict nature reserves only to persons with written permission, and therein prohibit the same activities (above). Section 9 stated that people enter

parks and reserves at their own risk, and HMG is not financially responsible for injury or death sustained inside. In contrast to this, Indian wildlife legislation provides financial compensation to the families of people killed by wildlife but also imposes much greater fines for offenses (Saharia 1982).

Section 6 made legal the operation of private lodges inside national parks with a special permit. A subsequent amendment allowed for the same operations inside wildlife reserves (below). Section 10 gave complete protection to schedule I (protected) species, but stipulated that mad elephants or man-eating tigers, both protected species, may be destroyed. The use of a weapon against any wild animal, protected or otherwise, in the process of attacking a person or domestic animal, was permitted under Section 21. Since

it is unlawful to bring weapons inside of most protected areas, however, this section would presumably only apply to areas outside of parks or wildlife reserves but could apply inside hunting reserves. The act also lists species that may be harvested for other purposes (e.g., trophy hunting) or collected for scientific purposes under schedule II.

Sections 11–14 and 17–20 dealt specifically with hunting legislation. Various clauses empowered HMG to fix quotas, grant or cancel licenses, impose closed seasons, and also impose restrictions on the acquisition, sale, or transfer of trophies of species that can be hunted legally (under schedule II). Sections 23–31 empowered wildlife officers to inspect and search, arrest without warrant, investigate, and confiscate illegally obtained wildlife products or weapons. These sections also allowed for rewards to informers and imposition of penalties against offenders and their accomplices in wildlife-related cases. For example, rewards of up to NRs 5000 (Nepali rupees, 1991 exchange rates) (US \$170) can be provided to informers whose information leads to the arrest of a rhino poacher, and 50% of the cash value can be given for providing information about people in possession of any illegal trophy. Penalties stipulated in the act are also rather severe; any offense is punishable by a fine of up to NRs 10,000 (US \$330) and/or jail sentences of up to 2 yr depending on the severity of the offense. Some offenses, such as hunting inside parks or wildlife reserves, hunting any schedule I (protected) species, or unlawful possession of rhino horn are offenses subject to fines of up to NRs 15,000 (US \$500) and/or imprisonment of 2–5 yr. These sections, as a whole, provide a very comprehensive legal framework for wildlife officers to investigate, try, convict, and punish offenders of wildlife legislation. The act also allowed for the protection of parks and reserves by soldiers of the Royal Nepali Army, battalions are currently posted in most Nepali parks and reserves, in addition to the protection staff employed by DNPWC.

Section 32 of the act gave HMG the power to amend the schedules and to frame regulations. The DNPWC was established with the passage of this landmark piece of legislation. This was the first comprehensive legislation ever enacted with respect to wildlife in Nepal and represented a milestone in conservation in the country. The Wildlife Conservation Act of B.S. 2015 (1957) afforded protection only to rhinos and their habitat; after the passage of the 1973 act, HMG had broad legal powers to protect and conserve species and their habitats throughout the Kingdom.

General Rules and Amendments to NPWCA 2029 (1973)

The first set of rules published after the passage of the act were those for Royal Chitwan National Park, Nepal's first protected area under the new legislation (HMG 1974a). These rules formalized the boundaries of Chitwan, which were later extended to include more area, and stipulated an entry fee of NRs 65 (US \$2.20) for foreign nationals and NRs 5 for Nepali citizens, and later amended to NRs 250 (US \$8.30) for foreign nationals (HMG 1989a). Actions prohibited in the park included building dwellings, cultivation, grazing livestock, cutting or removing plants, and making fires. Camping was allowed under those rules, but park authorities no longer issue camping permits because it is difficult to control. Prohibitions against carrying weapons, explosives, or any item that could be used to kill or injure wildlife (nets, poisons, baits, etc.) were also imposed, as were prohibitions against hunting or harassing any wildlife. Restrictions were imposed against advertising or playing music anywhere in the park except in legally established lodges. Fishing by local residents was made legal under certain conditions, and the collection of specimens of all kinds except schedule I species was allowed for scientific purposes. The rules also permitted driving; private vehicles are required to pay certain fees and abide by traffic laws. The rules also imposed restrictions against bringing any poisonous material into the park or putting them into waters that flow into the park. This has recently become an important issue because a paper factory has been built near Narayan-ghat, upstream from Chitwan National Park. Environmental impact studies are ongoing, and if effluents prove too toxic, HMG is legally required to impose more strict waste-treatment procedures on the facility.

These regulations also gave assistant wardens (gazetted third-class officers) the power to hear and decide cases of illegal removal of forest products, illegal fishing, entry without a permit, grazing of livestock, or camping in nondesignated areas. Wardens (gazetted second-class officers) were given the power to hear cases regarding the destruction of boundary fences, poaching, and placing or spreading toxic materials, in addition to hearing cases of lesser offenses.

The rules for wildlife reserves were published later (HMG 1977b) but were essentially similar to those published for Chitwan, with the exception that public entry was not permitted into wildlife reserves until a subsequent amendment was passed (HMG 1982a), and rules for that amendment were published (HMG

1985a); this allowed tourists to enter wildlife reserves for a fee of NRs 60 (US \$2.40) for foreign nationals and NRs 5 (US \$0.20) for Nepali citizens. Fees were later increased to NRs 250 (US \$8.30) for Chitwan National Park (HMG 1989a) and for Himalayan parks (HMG 1988). The 1985 wildlife reserve regulations also stipulated that children below the age of 5 are admitted free of charge, and those between the ages of 5 and 12 are admitted half price. Fees were also imposed for fishing, camping, vehicle use, and bringing domestic livestock through access roads in wildlife reserves.

Besides opening wildlife reserves to tourism, the 1982 amendment further clarified the situations under which people may kill wild animals in self-defense, and they allowed for hunting or trapping of diseased or injured wildlife by the order of the prescribed wildlife authority (HMG 1982a). The amendment also extended rewards and punishments to cases involving tiger and musk deer poaching in addition to those stipulated in the original act, and fines were increased for a variety of wildlife offenses. This amendment was therefore very important because it extended protection of endangered species and areas, but also extended protection of people and domestic stock in the case of harmful or dangerous wildlife. Rules published in 1979 allowed Nepali citizens to capture wild boar (*Sus scrofa*) with a special license (HMG 1979a), and this was later extended such that boar that came into agricultural areas could be captured or killed by landowners without a license.

Section 16 of the 1973 act stipulated that park or reserve authorities may allow for the removal of natural produce if it was considered important for the management of the area. This section led to the legal removal of thatch grasses in the Terai reserves for two weeks per year for a fee of NRs 5 (US \$0.17) per person per season. An important resource is therefore provided to local residents at a very low cost. Lehmkuhl and others (1988) and Heinen (1992) estimated the economic importance of thatch removal to local communities around two different Terai reserves. Facility zones in Himalayan reserves to provide grazing, fuelwood, and timber to local residents were also made legal under Section 16.

The Himalayan National Park Regulations (HMG 1979b) required visitors to be self-sufficient in fuel, but this has been frequently circumvented by individuals or small groups of trekkers who stay in locally owned lodges because the regulations also allowed local residents use of firewood. It is enforced in the case of large, organized trekking parties or expeditions. The regulation also stipulated that garbage is to

be disposed of at designated places and that wardens may designate facility areas for grazing and fuelwood collection by local residents.

All of the mountain parks except Rara and Khaptad (the smallest) are inhabited. Although this is technically not legal, the letter of the law is met because villages and their surrounding agricultural holdings are excluded from (zoned outside of) the park. It would clearly not be feasible to remove the thousands of residents who live inside Langtang or Sagarmatha (Mt. Everest) parks, for example, and where this was done (Rara), the short-term result was unfortunate as it led to the deaths of some of the displaced residents (Furer-Haimendorf 1986).

An amendment to the 1973 act was recently passed that will allow for the creation of a fifth type of protected area in Nepal (HMG 1989b), which would approximately correspond to IUCN category V (Managed Landscapes and Seascapes; IUCN 1990). This amendment was in response to a recent proposal for the Annapurna Conservation Area in central Nepal (Sherpa and others 1986, Rana 1990), and represents another major advancement in Nepali conservation law. The Annapurna project allows for much more local participation and local utilization of resources (Hough and Sherpa 1989).

Hunting Rules and Regulations

Hunting regulations were published shortly after the 1973 act (HMG 1974b) and were revised in the Third Amendment Rules (HMG 1985b). Four types of hunting licenses can be issued in Nepal: district, general, bird, and supplementary. District licenses, for Nepali citizens only, are sold at District Forest Offices for a fee of NRs 350 (US \$11.70); they are valid for ten days and allow hunters to shoot a maximum of three mammals and ten birds, with quotas given for individual species. Several small game species (e.g., rabbits, pheasants, doves, peafowl, ducks) and abundant larger mammals (e.g., wild boar, spotted deer; *Axis axis*) may be hunted with district licenses. General licenses are issued by the DNPWC to Nepali citizens for a fee of NRs 400 (US \$13.30) and to foreign nationals for a fee of NRs 5000 (US \$167). They are valid for 15 days in the Terai and 21 days in the mountains. Hunters are permitted to harvest up to four mammals and ten birds in the areas stipulated on the license, with quotas given for individual species, and several additional mammal species may be hunted with general licenses in addition to those permitted under district licenses. Bird licenses may be purchased for the bird species and quotas permitted

under the general license for a fee of NRs 300 (US \$10) for Nepali citizens and NRs 2000 (US \$67) for foreign nationals.

Supplementary licenses may be purchased by anyone with a general license and are valid for nine days in addition to the time stipulated on the general license. Any mammal species listed on the general license may be harvested with a supplementary license, in excess of the general license quota, by paying the appropriate fee. Several other large game species such as leopards (*Panthera pardus*), Himalayan black bears (*Selanarctos thibetanus*), and wild sheep and goats (several species) may only be harvested with a supplementary license. The fees for these species are rather high; for example, NRs 1000 (US \$33) for Nepali nationals and NRs 5000–10,000 (US \$165 to \$333) for foreign nationals, depending on the species, to hunt bear, wild goats, or leopards, with a quota of one animal for each license. In addition to the fees listed per animal, a block registration fee of NRs 500 (US \$17) for Nepalis and NRs 1000 (US \$33) for foreigners is required to reserve a block of forested land (a hunting unit) for the use of the hunter. All trophies must be submitted to DNPWC for inspection, and a certificate is then issued to the hunter indicating the animal was legally obtained. Hunting is legally allowed in Nepal from mid-October to mid-April, although closed seasons may be imposed locally.

The King Mahendra Trust for Nature Conservation Act

The idea of establishing a nongovernmental organization for nature conservation in Nepal was gaining popularity in the late 1970s and early 1980s, due to the growing awareness of environmental degradation and the plight of the rural poor dependent on natural resources (Rana and others 1986). The King Mahendra Trust for Nature Conservation (KMTNC) was established in 1982 with the passage of the KMTNC Act (HMG 1982b). The act contained 20 sections and established the trust as an autonomous, nongovernmental, nonprofit organization whose purpose is to conserve, preserve, and manage natural resources for the benefit of the citizens of Nepal. His Majesty King Birendra is the patron of the trust, and His Royal Highness Prince Gyanendra has been named chairman. The board of directors includes the chairman, three secretaries nominated by HMG, and one member-secretary. All appointments are made by the chairman for 5-yr terms, and they are all members of the governing board of trustees.

The duties of the trust as defined in the 1982 act are to: conserve and manage wildlife and other natu-

ral resources, make arrangements for the development of national parks and reserves, and conduct research on wildlife and other resources. The trust has the legal power to obtain cash or in-kind assistance from, donations from, and contracts with foreign and international associates and institutions to carry out its duties. Stipulations for accounting and auditing are also given in the act. Regulations published subsequent to the act established the office, rules for employment, and honors and tax exemptions for donors (HMG 1984). There are KMTNC chapters in France, Germany, Great Britain, Japan, and the United States. The trust, in conjunction with organizations such as UNESCO, WWF, and the Smithsonian Institution, has had many accomplishments in its brief history, including the establishment of the Annapurna Conservation Area and the extension of research and education programs in Royal Chitwan National Park (KMTNC 1985).

International Agreements

Nepal signed CITES (the Convention on Trade in Endangered Species of Wild Fauna and Flora; Favre 1989) in 1975; it was among the first countries to do so. DNPWC is the management authority for Nepal and has served twice on the standing committee of CITES representing the Asia region; the country has participated in all general assembly meetings and standing committee meetings.

Although about 30% of Nepal's bird species are migratory, HMG currently has no bilateral migratory bird treaty. However, Nepal and other countries in the Indian Subcontinent have agreed to take part in the international waterfowl census sponsored by the International Waterfowl Research Bureau (IWRB), based in Great Britain (IWRB 1987). Censuses were begun in Chitwan and Kosi Tappu in 1987 and have been expanded to other parks and reserves (Bauer and Timmerman 1987).

Nepal has no formal agreements for the management of international reserves, although several exist de facto. This began with a 1978 request to Rajiv Gandhi, at that time a member of parliament of India, to establish Valmiki Sanctuary (R. P. Yadhav, personal communication, former warden, Royal Chitwan National Park), a 460-sq-km reserve located on the Indo-Nepalese border in the Indian State of Bihar, adjacent to Chitwan National Park, which effectively increased the area under protection for the Chitwan ecosystem. India has established two other reserves close to Nepali reserves. These are Dudwa National Park, 490 sq km in area, established in 1968 and located on the border close to Sukla Phanta Wildlife

Reserve in Nepal, and Katerniaghāt Sanctuary, 400 sq km in area, established in 1976, and located on the border close to Bardia National Park in Nepal. The Chinese Government has recently created a new reserve in the Autonomous Region of Tibet as part of the Heart of the Himalayas Conservation Program, sponsored by the USA-based Woodlands Mountain Institute. This reserve borders Sagarmatha (Mt. Everest) and Langtang National Parks (Jackson and others 1990). International reserves can be very effective for the conservation of many species; most of the wild elephants (*Elephas maximus*) in Nepal, for example, are thought to cross the Indo-Nepali border regularly (Santiapillai 1987); similarly, the wolves (*Canis lupus*) reported in the Sagarmatha region may regularly cross into Tibet (Jeffries and Clarbrough 1986). Both are schedule I (protected) species. International reserves could become very important for Nepal, considering that parts of the boundaries of most of the country's reserves are located on or near international borders.

India and Nepal have cooperated on several other conservation efforts as well. Beginning in 1985, Nepal provided rhinos for India's translocation program in an effort to begin a new population of the species in Dudwa (Choudhury 1985, Dinerstein and McCracken 1990). In exchange, India gave Nepal 16 domestic elephants to become the core of Nepal's elephant breeding program based in Chitwan (Dhungel and others 1990). Nepal, India, and five other countries in the South Asia Region (Bangladesh, Bhutan, the Maldives, Pakistan, and Sri Lanka) are also members of the South Asia Association for Regional Cooperation (SAARC); the SAARC secretariat is located in Kathmandu. Although SAARC has been primarily concerned with economic and political agreements, several meetings have focused on conservation problems, including water and soil erosion (Verghese 1985). There is obviously great potential for more regional cooperation in other conservation issues, including migratory wildlife and international reserves, within the SAARC framework. Pradhan (1989) suggested that there is a great need to deal with integrated ecological issues within SAARC, including forestry, parks, and wildlife, in addition to water and soils.

Nepal is a state member of IUCN and regularly sends participants to IUCN general assemblies. The country has prepared a National Conservation Strategy with IUCN (IUCN 1984a,b). Nepal is also host to the eight nation member International Center for Integrated Mountain Development (ICIMOD), begun in 1983 and first proposed under the country's Man and the Biosphere Program, sponsored by the United Nations Scientific, Educational and Cultural Organi-

zation (UNECSO). ICIMOD has many accomplishments to date, including cosponsoring a seminar on Himalayan protected areas (KMTNC/ICIMOD 1985). In addition, Nepal became a party to the World Heritage Convention in 1978 (Hales 1984). There are currently three listed Nepali World Heritage sites: Kathmandu Valley (a cultural site) and Chitwan and Sagarmatha national parks (both natural sites). UNESCO has supplied World Heritage Trust funds under this agreement for alternative energy projects and manpower development in the Sagarmatha region (Jeffries 1984).

The Organization of DNPWC

The 1973 act created the DNPWC out of an office by the same name that was administratively under the Department of Forestry. The departments are now separate under the Ministry of Forestry and Soil Conservation. The DNPWC is solely responsible for enforcing all wildlife laws within parks and reserves, and the Department of Forestry is responsible for enforcement in other forested areas. The highest ranking officer within the DNPWC is the director general, under whom are two deputies, which are first-class positions, and many second- and third-class officers including wildlife officers and wardens.

Each park and reserve maintains an office at the park or reserve headquarters. The highest official within any park or reserve is the chief warden or warden, depending on the size and type of protected area and on the complexity of management problems; most parks are headed by chief wardens and most reserves are headed by wardens. The technical and administrative staffs of any protected area are under the direct supervision of the chief warden or warden. Technical staff includes veterinary doctors, rangers, game scouts, drivers, etc., and administrative staff includes accountants, clerks, typists, office assistants, etc. There are currently 788 posts within the DNPWC: 422 are technical and 366 are administrative. The department is divided into seven units: national parks and reserves, conservation education and publicity, planning and research, accounting, administration, elephant stables, and the national zoological garden.

General Discussion

The development of conservation law in Nepal proceeded at a very rapid pace, from a rather humble beginning in 1957 to the enactment of a very comprehensive piece of legislation by 1973. Much of the earlier emphasis was on preservation of important spe-

cies and areas, and the evidence suggests that HMG and its foreign donors have been largely successful in this goal. For example, the Chitwan population of rhinos rose from an all time low of less than 100 animals to its current level of over 350 (Dinerstein and McCracken 1990); the population of tigers in Chitwan has risen from about 25 animals to its current level of about 65 (J. D. L. Smith, University of Minnesota, personal communication). Similarly, DNPWC records show that populations of many other protected species have risen in parks and reserves throughout the country (e.g., wild buffalo, swamp deer, musk deer, etc.). Nepal now has 13 protected areas and will have another, covering over 10% of the country's land area (compared to 2.8% of the land area of the globe), and incorporating areas from the lowlands to the highest peaks. This could not have been achieved without the political and institutional will within HMG and the major influx of foreign aid in this sector. Part of the impetus leading to this rapid success in conservation is due to tourism, Nepal's largest industry. Annapurna Conservation Area and Chitwan, Langtang, and Sagarmatha (Mt. Everest) national parks are very popular attractions for foreign tourists (HMG 1987a,b, 1991). There is a great potential for tourism in other reserves as well (e.g., Shey Phoksundo, Bardia, Khaptad, and Rara National Parks), although infrastructure is lacking in many areas.

Along with this rapid success in conservation and rise in tourism came many types of problems involving local residents living in and around parks or reserves. The earlier legislation, in its zeal for preservation of species and areas, effectively omitted Nepal's rural poor from the processes of local conservation. Development administration in Nepal in general suffers from a high degree of centralization (Bhatta 1987), which can greatly impede conservation programs (Repetto 1986). Amendments and rules published subsequent to the 1973 act were partially in response to this problem, as many of them gave more power to local people to protect themselves and their livestock from wild animals and to utilize resources on a controlled basis from parks and reserves. Tourism itself, if properly controlled, can provide conservation incentives to local people by providing sources of income (MacKinnon and others 1986, McNeely 1988, Richter 1989, Whelan 1991). However, the situation in Nepal is far from equitable and there are park-people conflicts reported throughout the country, some rather severe (e.g., Heinen 1992). For example, Sherpa and others (1986) reported that much of the profit from tourism in the Annapurna Conservation Area goes to traditionally wealthy families, who can

afford to set up tea shops and hotels. Such is also the case around Chitwan National Park. This shows the great need for rural development schemes integrated within the framework of reserve management to promote conservation and to allow a greater number of people (all of whom are likely to incur costs) to benefit from their proximity to protected areas (e.g., West and Brechen 1991). Although many such projects are now underway in Nepal's most visible protected areas [Annapurna, Chitwan, Sagarmatha (Mt. Everest), and Langtang], they lag far behind the rapid pace of the legislative development reviewed here. Many of the activities planned by KMTNC and ICIMOD are in response to these great needs within the country (KMTNC 1985, KMTNC/ICIMOD 1985). Both organizations are actively involved in promoting integrated development-conservation schemes and have thus far been successful at acquiring foreign backing to do so.

Although the conservation of biodiversity has apparently been successful within parks and reserves, such may not be the case outside them. With specific regard to hunting legislation, there are several benefits inherent in licensing system described above, but there are several problems as well. The combinations stipulated under the general, district, and bird licenses assure a high probability that the hunter will harvest at least something, and the pricing system accounts for the fact that Nepali nationals, whose land tax payments add to general revenues including wildlife conservation, should not be expected to pay as much as foreigners. The supplementary license system has the dual advantage in assuring high revenue per animal without depleting stock. However, more stringent quotas may be in order for many species. For example, the licenses list general avian taxa as single units (e.g., ducks, doves, partridges) when some species from each group are known to be rare, whereas others are common (Fleming and others 1984, Inskip and Inskip 1985, Inskip 1989, Heinen 1988) and all can be harvested under the law. Sharma (1982) pointed out some additional problems with district and general license quotas for mammals in Bara District, the site of a proposed hunting reserves, and he concluded that over-harvest of some species was very likely under the current rules. The third amendment rules also listed fees for many smaller game as well as nongame species that may be harvested for scientific or other purposes. There are currently no regulations establishing quotas for these species; some of the nongame species listed in schedule II in Nepal are fully protected in India (Prater 1980, Saharia 1982, Seshadri 1986) and the status of

many is completely unknown in Nepal. There is a great need to address the problems of wildlife conservation in areas outside of reserves, as this has been almost completely neglected in the country to date (Heinen and Yonzon 1992). Poaching in many district forest areas is thought to be common, but its extent is unknown.

The presence of army personnel within reserves is also rather equivocal: advantageous in that it may be responsible for reducing poaching and other illegal activities in protected areas, but disadvantageous for several reasons. First of all, the chain of command is divided between two HMG officers: a warden and a protection unit commander, which many wardens will privately say can create conflicts. Secondly, soldiers designated to DNPWC duty are given only cursory special training for the assignment and may have little understanding about their roles. Thirdly, the military protection units currently absorb up to 70% of the DNPWC budget, which imposes monetary constraints on the operation of the DNPWC (Lucas and Bajimaya 1987). The role of the army in Nepali protected areas is in need of review and possibly reconsideration. Annapurna Conservation Area, which has no army personnel, may be a litmus test for the efficacy of soldiers posted as protection staff in Nepali reserves.

Though well established, the organization and staffing of the DNPWC may also need some further consideration. Lucas and Bajimaya (1987) pointed out several problems with the staffing situation. At any given time, several higher-level posts are not staffed due to shortages of qualified personnel or study leaves of existing personnel. The latter has created chronic staff shortages in DNPWC since its inception. Lucas and Bajimaya suggested that the policy of obtaining foreign aid to send DNPWC staff on study leave for extended periods is in need of reconsideration because of the staff shortages this creates and because the descriptions of most of the posts do not require advanced research degrees from developed countries; such aid could obviously be used elsewhere. However, we contend that there is at least one major advantage to this policy: it provides a strong incentive for well-qualified and experienced people to stay in DNPWC and not transfer to the Department of Forestry, permitted under ministry regulations. Several DNPWC officers have also been deputated to the KMTNC, further compounding the staff shortages.

This brief review shows that there have been many genuine successes in legislation and implementation of conservation programs in Nepal, but there are many areas where much more work is needed. Most

of the problems we have discussed above are apparently solvable, and there have been suggestions and in some cases proposals to do so. With regard to the role of military in reserves and staff shortages in the DNPWC, the very fact that this information appeared in the Master Plan for Forestry Sector (Lucas and Bajimaya 1987) implies that the problems are well known, and solutions are under consideration. Much more imminent threats to conservation in Nepal in the 1990s are the rapid rise in human population (currently over 18 million, expected to increase to 25 million by the turn of the century; HMG 1987b) at a time when life-support systems are apparently already taxed (e.g., Eckholm 1976, Carson 1985), the rising aspirations and hence greater demands on resources of this human population (Shah 1988), and the current (since 1988) political turmoil in the country (Koirala 1990). Although the pro-democracy movement may be a positive force and will hopefully improve conditions for Nepal's rural poor, the instability it has created over the past several years may have detrimental effects in the short term on conservation, making law enforcement difficult until the situation stabilizes. Like the situation everywhere, conservation in Nepal cannot be separated from, and is dependent on, the social, economic, and political climate in which it occurs. Hence, conservation legislation and programs must be sensitive to these factors and must adjust accordingly.

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