World Heritage Sites

Protected Areas and World Heritage

HUASCARAN NATIONAL PARK
PERU

Mount Huascarán is the summit of the world's highest tropical mountain range, the Cordillera Blanca of the central Peruvian Andes, a spectacular landscape of high plateaux, ravines, torrents and lakes, glaciers, snow-covered peaks over 6,000m high, well preserved foothill forests, great montane biodiversity and archaeological remains. It contains spectacled bear, vicuña and the Andean condor.

Threats to the site: The proliferation of people and livestock, and uncontrolled exploitative tourism are degrading the quality of the site.

COUNTRY
Peru

NAME
Huascaran National Park

NATURAL WORLD HERITAGE SITE
1985: Inscribed on the World Heritage List under Natural Criterion viii.
1995: Inscribed on the World Heritage List under additional Natural Criterion vii.

STATEMENT OF OUTSTANDING UNIVERSAL VALUE [pending]

INTERNATIONAL DESIGNATION
1977: Designated a Biosphere Reserve under the UNESCO Man & Biosphere Programme (399,239ha).

IUCN MANAGEMENT CATEGORY
II National Park

BIOGEOGRAPHICAL PROVINCE
Southern Andean (8.37.12)

GEOGRAPHICAL LOCATION
Rises in the Cordillera Blanca of the central Peruvian Andes, 250 km northeast of Lima. The Park covers parts of ten provinces in the Department of Ancash: Huaylas, Yungay, Carhuaz, Huaraz, Recuay, Bolognesi, Huari Corongo, Asunción, Mariscal Luzuriaga and Pomabamba It lies between 08°50' - 10°40' S and 77°07' - 77°49' W.

DATES AND HISTORY OF ESTABLISHMENT
1966: Logging and hunting prohibited in the Cordillera Blanca;

1967: A vicuña and *Puya* monitoring zone established in the Huaraz Forestry Region (10,000 ha);

1975: The National Park established by Supreme Decree 0622-75-AG under the Forests and Wildlife decree-law 21147, permitting existing uses within the Park if non-destructive;

1977: The Park designated a UNESCO Biosphere Reserve.

LAND TENURE
Most of the Park belongs to the State with five properties conceded to the SAIS Atusparia, and seven to farming communities. Confusion persists about land tenure and the status of the protected area. Local farming communities in the north and small-scale pastoralists in the south claim ownership. It is administered by the National Institute of Natural Resources *(Instituto Nacional de Recursos Naturales,* INRENA) under the Natural Protected Areas Agency *(Intendencia de Áreas Naturales Protegidas,* IANP) of the Ministry of Agriculture.

AREA
340,000 ha. The buffer zone of 170,000 ha is outside the World Heritage site.

ALTITUDE
2,500m to 6,768m (Nevado Huascarán).

PHYSICAL FEATURES
The Park covers the length of the Cordillera Blanca range in the central Andes, 158 km from north to south and 20 km from east to west between the wide valleys of the Callejón de Conchucos to the east and the Callejón de Huaylas to the west. The Cordillera Blanca is the highest snow-capped tropical range in the world, with 27 peaks above 6,000m, 663 glaciers, 296 lakes and 41 rivers flowing in deep ravines. The Park rises from 2,500m at Grand Cataract near the northern boundary, to El Huascaran, the highest peak in Peru and fourth highest in South America, but there are five or six passes low enough for roads to cross. As well as serrated peaks, the landscape has severely eroded steeply sloping terraces, lateral moraines and some level river terraces. Ravines on the western side are extremely steep and narrow, though they become less so towards the south. Ravines on thre eastern slope ravines are as deep and enclosed, but less steep.

The area's geologic structures are very complex. Sediments from Upper Jurassic seas were uplifted and, with Cretaceous formations, were severely folded and faulted by comlex tectonic activity at the end of the Cretaceous period, Tertiary positioning of a batholith, and vulcanism in the Pliocene and Pleistocene epochs. Folded sedimentary rocks are predominantly oriented northwest-southeast, cut through by faults followed by the rivers. There is still seismic activity in the area and three thermal springs exist. Disastrous debris flows triggered by earthquakes occurred in 1945, 1962 and in 1970, when the 20,000 inhabitants of Yungay were smothered by mud. Tremors continue to precipitate glacier, rock, land and mud slides (Castro *et al*., 1990). The soils formed from alluvium, colluvium and glacial residues are acid and infertile. Erosion is high due to overgrazing, deforestation, and inappropriate agriculture on steep slopes compounded by glacial retreat and climate change (IANP, 2003).

Glaciation is a major part of the Park's hydrology and glaciers provide the water for some million people. Approximately 27 are located above 6,000m, more than 200 above 5,000m and a total of 680 are distributed along the 180 km range. As recorded by IANP they covered 69,370 ha in 2003 but are subject to regional and global climatic variations and are constantly melting or calving. The 296 mostly glacial lagoons cover 2,800 ha. 23 major rivers discharge into the River Santa in the west from 457 glaciers, one from 14 glaciers into the Pativilca Rver in the southwest and on the east, 17 from 192 glaciers into the Marañón, reputed source of the Amazon (IANP, 2003). It is estimated that 22% of the volume of glacial ice in the Cordillera has disappeared since the late 1960s. There is a danger that meltwaters may cause many of the lakes to breach their morainal dams, flooding the valleys below (Addison, 2007).

CLIMATE
This tropical range is permanently snow-capped. Precipitation comes mainly from the condensation of very humid air rising from the Amazon basin, which caps the peaks with snow and loses moisture as it descends the western slopes although Pacific air movements bring some rain. The atmospheric stability of the coastal desert ensures a lack of moisture and the west slopes are predominantly cold and dry. The mean annual precipitation is approximately 884mm (recorded at 3,980m) falling mainly from November to March, months which are warm and humid. April to October is dry. Average temperatures in the lower part of the Park range between 6°C and 14°C. Those on the peaks fall to less than 1.5°C. The extreme conditions above 4,500m include great variations between day and nighttime temperatures, frequent frosts, low atmospheric pressure, high winds, intense solar radiation, drought, frozen soils, and a daily freeze-melt cycle.

VEGETATION

The Cordillera Blanca forms a mountain island above the surrounding valleys where the use of primitive and inappropriate production methods combined with high population growth has destroyed the original vegetation cover; leaving few remnant native forests and many exotic invaders. The altiplano is notable for *Puya raimondii*, (EN) a bromeliad which has the largest flower-spike in the world.

Seven ecosystems and eleven types of vegetation are listed in the Master Plan (IANP, 2003):

Ecosystem	Height	Temp.	Precipit'n (mm)	Area	Aspect
Montane tropical grasslands	3,000-3,500m	6-14 °C	250-500	0.5%	in the north
Very humid montane tropical forest	3,000-3,800m	6-12 °C	1,000-2,000	0.8%	in the east
Humid montane tropical forest	3,000-4,000m	6-12 °C	380-948	3.1%	in the west
Pluvial sub-Andean tropical paramo	~3,800m	3-6 °C	1,000-2,000	14.3%	in the southeast
Very humid sub-Andean tropical paramo	3,800-4,500m	3-6 °C	500-1,200	20.3%	on both slopes
Pluvial Andean tropical tundra	4,500-5,000m	1.5-3°C	680-1,290	32.5%	on both slopes
Snowcovered tropical tundra	>5,000m	<1.5 °C	500-1,000	28.5%	the peaks

Thus, over a quarter of the Park is snow-bound, a third is tundra and a third is paramo (upland plain or *puna*) with small areas of tropical montane forest in the valleys. 779 plant species in 340 genera and 104 families grow in a mosaic of great diversity in the eleven vegetation types: forest, *matorrales* scrub, grasslands, the most extensive vegetation type in the Park, cliff and rock slope lithophytes, hydrophytes growing in swamps, *tuberas* (bog-mats), lakes, pools, springs, and Andean tundra plants.

The paramo between the glacier and agricultural zones is irregular and rocky with a scattered cover of forest and scrub species of *Buddleia, Scallonia, Berberis, Baccharis* and *Gynoxis* among the predominant grasslands. Typical shrubs are *Acacia, Spartium, Arundo, Alnus, Lupinus, Physalis, Salix, Eriotheca*, *Cestrum, Rubus, Baccharis, Agave* and several Cactaceae and parasitic *Tristerix* sp. (Luyo *et al*., 2004). The highest diversity exists in the riparian forests of the lower valleys of Llanganuco and Parón where species include *Alnus acuminata*, *Weinmannia* sp.and *Polylepis sericia* with a dense and varied understory. In drier valleys are forests of *Polylepis weberbauerii*, *Gynoxys* sp. and *Buddleia incana*. *Matorrales* shrubland, tall and very dense, grows in well drained fertile ground. The commonest species include *Gynoxys* sp., *Myrica pubescens* and *Baccharis* sp. High rocky *matorrales* species include *Loricaria ferruginea*, *Buddleia coreacea* and *Ribes* spp. Hardy cliff-growers include *Elaphoglossum* sp. and *Grammitis* sp. Landslides with thin, rocky soils support orchids of the genera *Masdevalia, Stelis, Epidendron, Pleurothallis* and *Trichocerus muralis*; and Bromeliaceae, such as *Tillandsia* and *Pitcairnia*, ferns and the low succulent *Villadia imbricate* (IANP, 2003).

Grasslands extend from the lowest levels to the tree line, covering much of the cold dry altiplano or *puna* with a resilient mat of high grass and tussock species of *Festuca, Calamagrostis* and *Stipa* with occasional islands of scrubby elfin woodland of *Polylepis (queñua)*, a high-altitude Andean endemic relic, found mostly in the Pachacoto, Carpa and Queshque valleys. It is in some of the valleys here that patches of the spire-flowered bromeliad *Puya raimondii* (EN) are common. This has the largest inflorescence in the world, 9-10m high. The high humidity and irregular drainage at high elevations create peat bogs saturated with water and are green most of the year. Plants above 4,500m have adapted to the extreme conditions by dwarfism, matting, prostrate and cushion habits and deep rooting, lichens being the most hardy (IANP, 2003).

FAUNA

The Park harbours important populations of threatened species notably the spectacled bear *Tremarctos ornatus* (VU), most often seen in Llanganuco in the north and Potaca, the vicuña *Vicugna vicugna* found in Llanganuco and Carpa, and the near-threatened Andean condor *Vultur*

gryphus which is found wherever there are cliffs suitable for breeding. Over ten mammal species in eight genera are recorded. These include a rodent, the northern mountain viscacha *Lagidium peruanum*, the *culpeo* or Andean fox *Pseudalopex culpaeus*, long-tailed weasel *Mustela frenata agilis*, and Humboldt's hog-nosed skunk *Conepatus humboldtii,* Incan cougar *Puma concolor incarum*, Andean cat *Leopardus jacobita* (EN) and pampas cat *L.colocolo*, north Andean deer or huemul *Hippocamelus antisensis* (VU), which is found in the north, and whitetail deer *Odocoileus virginianus.*

112 bird species in 33 families are recorded with the greatest variety found in ravine forests. Notable species include puna tinamou *Tinamotis pentlandii*, torrent duck *Merganetta armata* among the many species of duck, and the Andean condor. There are also red-backed hawk *Buteo polyosoma,* white-throated caracara *Phalcoboenus albogularis,* protected in Peru, giant coot *Fulica gigantea,* Peruvian giant hummingbird *Patagona gigas peruviana* and the rarer small species ash-breasted tit-tyrant *Anairetes alpinus* (EN), white-tailed shrike-tyrant *Agriornis albocorda* (VU), Mantaro pale-tailed canastero *Asthenes huancavelicae,* white-cheeked cotinga *Zaratornis stresemanni* (VU), rufus-breasted and plain-tailed warbling-finches *Poospiza rubecula* (EN) and *P. alticola* (EN).

CONSERVATION VALUE

Mount Huascarán is the highpoint of the world's highest tropical mountain range, a spectacular landscape of high plateaux, ravines, torrents and lakes, glaciers, snow-covered peaks over 6,000 high, foothill forests, great montane biodiversity and archaeological remains. The Park lies in a Conservation International-designated Conservation Hotspot, a WWF Global 200 Freshwater Eco-region, a WWF/IUCN Centre of Plant Diversity, a BirdLife-designated Endemic Bird Area and overlaps a UNESCO Biosphere Reserve.

CULTURAL HERITAGE

The Cordillera region has been settled for millennia. The most ancient cultures seem to have developed in the northern part of the Park, between Carhuaz and Pomabamba. Men crossed the mountains, built great agricultural terraces and corrals, and dams and canal systems to provide water. They left cave paintings, stone tombs, platforms, roads and fortifications. The remains at the Cueva del Guitanero in Yungay date back long before the Chavin culture which developed between 1500 and 300 BC. Thirty-one potentially important Chavin and Inca sites such as the ruins at Chuchumpunta, Gekosh, Willcahuain-Huyllap-Pumacayan and Hechkap-Jonkapampa are known - the largest known collection of such remains in the world (L. Hamilton, pers. comm., 1994). The mountain was named after a 16th century Inca chieftain. During the colonial period private plantations were established on traditional communal lands. In the 19th century the 'Atusparia Rebellion' protested this usurpationin the lands now within the Park.

LOCAL HUMAN POPULATION

The Callejón de Huaylas, just west of the National Park is mostly agricultural land and urban development. Within the Park there are 200 families with a total population of about 850, an increase of 2.5 over the last 20 years. In 1999, according to the Park Director, between 4,000 and 6,000 lived in 50 communities in the buffer zone on traditional subsistence farming, grazing, forestry and a little mining, but most are very poor. Today more than 260,000 live in the twelve surrounding towns and 17 smaller communities (Shoobridge, 2005). The valleys within the Park are grazed by both domestic and native livestock (llama and alpaca) under an agreement with the local people (INRENA, pers. comm., 1995).

VISITORS AND VISITOR FACILITIES

In 2000, the number of paying visitors at the two monitored entrances at Llanganuco and Carpa was 95,446, many being day visitors, plus 13,617 foreigners. This was an increase of 52% and 130% on the same groups visiting 13 years earlier (IANP, 2003) but does not cover entries from the many un-monitored entrances. Conventional tourism is heavily concentrated in the Llanganuco valley in the north and Pachcoto-Pastoruri in the south. In 2005 there were an average of 3,000 tourists a month and 7,000 in high summer. But the Park is also popular for adventure tourism and there is a well signed system of 24 trekking circuits and 102 mountaineering destinations. Walking, riding, skiing and guided archaeological tours are available. Road access is good to the foot of the mountains and at four points across them; there are also many tracks both in and across the mountains. There are lodges, a small visitor centre, hostel, campsite and a few refuges in the Park, and in the town of Huaraz, the Park's administrative and tourism centre. Tourists are served by 53 agencies 15

transport companies and some 250-300 guides. Regionally there are approximately 174 registered lodges, hotels and hostels, 160 restaurants and 20 interprovincial transportation agencies offering tourist services (Shoobridge, 2005). The Ancash Association has provided a sustainable tourism and training centre. Tourism and ecotourism are increasingly relied on to increase the incomes of this poor area.

SCIENTIFIC RESEARCH AND FACILITIES

Recorded research dates back to the 1860s when the Italian Raimondi made and published in 1873, a geologic study with descriptions of the floristic richness and of some archaeological remains in the great valleys. In 1903 several glaciers were first explored and in 1908, Huascaran was first climbed by an American woman with Swiss guides. Round the turn of the 20th century a German team of geologist, botanist and geographer conducted and published more thorough studies, de Carmand re-examined the geology and in 1932 German and Austrian Alpine societies mapped the area and made and published in 1935 the first systematic study of the range, *Die Weisse Kordillere*, followed in 1950 by Kinzl & Schneider's *Cordillera Blanca.* Glacier monitoring started in 1967. It was only in 1984 that the American botanist David Smith conducted the first detailed floral census of the mountain range, recording 779 species in the Park.

The 1990 Master Plan set out a program of research projects to provide baseline data for management decisions; also projects for historical-cultural research. Four projects of particular interest were: a census of vicuña population dynamics, medicinal plants, *queñua* forestry management and livestock. A wide variety of outside researchers have conducted studies not connected to this program on the geography, glaciology, flora and fauna of the area; and ice cores have revealed the area's palaeoclimate. INRENA's Glaciology and Hydric Resources unit, took glacier inventories in 1987 and 1997, and one of lakes in 1968: the monitoring and measurement of speed of flow and annual variation has been done for seven glaciers (Luyo *et al*., 2004). Tourism and mining are also monitored by INRENA. The effects of climate change are being monitored and studied, in particular the accelerated glacier melting, which is resulting in changes in the quality and quantity of water coming from the mountains and in greater risks of land slides, lake outbursts and the migration of certain species to higher altitudes. A mountaineers' hostel and Egenor Power and Ministry of Agriculture refuges are used by scientists, and there are two small environmental education centres. The headquarters at Huaraz is quite well equipped and there is a herbarium with 700 species (INRENA, pers. comm., 1995; Shoobridge, 2005).

MANAGEMENT

Huascarán National Park is managed by a Management Committee of the National Institute of Natural Resources (INRENA) and others, regulated under Natural Protected Areas Law 26834 of 1997 and is divided into four sectors: Llanganuco, Carpa, Ichic Potrero and Potaca. The Park has three main objects: to conserve its biodiversity and rare flora and fauna including the remaining *puya, Polylepis* and *Buddleia* forests; to maintain the Park's pristine scenery, vital to the local economy; and to protect the water quality of its catchments. The main social goals are to coordinate activities between the sectors and to secure the participation of local people in management and zoning. However, it was created after the passing of the Rural Communities Law, which granted them land. The communal businesses and communities on whose properties the Park was imposed and who had legal possession to it, were permitted their traditional farming and grazing in both Park and buffer areas so long as they did not clear cut trees or shrubs, burn pastures, overgraze, hunt or capture wildlife. Coexistence was to be ensured by zoning.

The first five year master plan for the core zone was approved in 1990 and revised for 2003-2007. This divided the Park into five zones: Strictly Protected, Primitive or Wildlife (light use), Restoration (of vegetation), Tourism and Recreation Use (intensive use), and Special Use (services and settled areas). It established nine management sub-programs for: resource management, protection, tourism and recreation, education, local cooperation, information, management support, administration and financing. A National Park Tourism and Recreation Use Plan was approved in 1996 which outlined the policies and strategies for managing tourism. Planning strategy documents for several of the 41 sub-basins have been drawn up to manage the resources in each and 62 Pasture Use Committees set up to promote sustainable use through local participation. Each family has the right to remove specified amounts of wood and medicinal plants for family use; in return they are required to plant trees, mainly *Polylepis* and *Buddleia*, and medicinal plants in restoration zones. Sixteen native plant nurseries were established to supply plants, with a larger-scale planting

program for local use in the buffer zone to help alleviate the pressure on the core zone. The border has been marked by 82 UTM-referenced markers.

In the 1990s only about 3,500 of the 5,000 *campesinos* with livestock were organised in groups. A program to replace cattle with less damaging alpaca has been attempted with the most traditional of them. Reduction in cattle numbers is also attempted, but is a slow and difficult process (L. Hamilton, pers. comm., 1994). Some established mining is permitted, dominated by the Antamina Mining Company with which good relations exist. It is monitored by INRENA (though it lacks a supervisory protocol) in cooperation with the Huascarán Work Group, a group of 24 national and international conservation, mining and other resource-based organisations which looks out for the Park's interests. The Ancash Association works to raise money for joint-tourism development projects near the Park. The Mato Grosso Association, an Italian missionary NGO, works with poor youth in the area in education, health and community development support. They run an Andean training school that prepares them to become mountain excursion guides, cooks, pack haulers and expedition organizers. and they run several basic lodges (Shoobridge, 2005).

MANAGEMENT CONSTRAINTS

The most significant threats to the Park are loss of vegetative cover from trampling by livestock and tourism, uncontrolled mining, proposed dams, and global warming that is thinning the glaciers. In addition, the management is limited by lack of resources and guards: the high returns from tourist entry fees go mainly to support other parks. The loss of vegetation due to pasture burns that become wildfires, to firewood collection for sale, clearing for agriculture, poor management of livestock, and severe overgrazing all accelerate the loss of cover and soil by erosion, the silting of watercourses and diminishing of key habitats such as *Polylepis* forests. Organised and informal illegal hunting, fishing and cattle rustling are also continual problems. Inappropriate use of agricultural land has directly contributed to the destruction and degradation of vegetative mats and the soil. In 2004, an INRENA animal census found that there are 2,444 recognized park users, 9,891 cattle, 11,584 sheep and 282 horses in the Park. There is a need for education amongst local groups, for whom proposed restrictions in the use of the area are a relatively new concept and who are not inclined to observe them. They lack means for controlling the health and effective marketing of their livestock, or combat invading cattle from the buffer areas, and overgrazing (L. Hamilton, pers.comm., 1994). A production and water and soil protection programme is needed to improve local agriculture and help the local economy to recover. (Shoobridge, 2005).

Tourism is increasing and where improperly managed creates serious impacts such as contamination of the pristine landscapes with garbage and wastes, unauthorized trails, loss of vegetation, soil erosion and glacier breakdown. It also creates a social divide between people working in the tourism industry and others. The Mato Grosso Association with high level political backing has developed commercial lodges despite the Park authorities and the local people with whom it competes. Because of its many glacial valleys, the Park is very vulnerable to entry from surrounding communities: many routes are accessible by car, there are numerous bridal paths across the Park's valleys, and 42 entrances, making the control of access very difficult. There is a continual threat of new road construction, pushed by mining interests and by municipal governments (L. Hamilton, pers. comm., 1994; Shoobridge, 2005).

Industrial activity threatens in the escalating demands for economic development by mining, road building, water power and development at the hot springs. Nine (of the 78) legal mining concessions on the site are currently operating and the dominant Antamina and Barrick companies are active in the transitional zone, encouraged by the Ministry of Energy. Mining often dumps residues in watercourses, acidifies streams, reduces vegetation cover, disturbs wildlife and degrades the landscape. Much of the rock and gravel extraction is done for the Ministry of Transport. And although water is needed for drinking, to irrigate fields and provide tourist attractions including the fast retreating glaciers, the hydroelectric power company Egenor, which takes water from the range (although payment for it does not return to the Park) plans to dam lakes in the Park to guarantee a constant water supply (Shoobridge, 2005).

The biggest obstacle to effective management is insufficient funding. Government centralisation through INRENA reduced funds and decision-making authority at lower and local levels and increased paper work. The inadequate budget is entirely derived from entrance fees at only two of the many park entrances. This is sent to headquarters and only 10% is returned to fund all the Park's operations and professional salaries. There is little left for the maintenance of infrastructure.

Many communities now charge their own entry fees, and people are setting up kiosks to serve the tourists. The Park administrators are losing control of the Park to them who see the Park not as national heritage but as a local source of income being ineffectively usurped by the Park authorities. The most effective strategy for dealing with these problems would be to strictly and efficiently follow the recommendations of the Master Plan. But this requires increased coordination with local stakeholders, stronger social associations, more understanding of the damage caused by overexploitation and much better funding to anable the control of burning, clearing, overgrazing, hunting, pollution and wastes (Shoobridge, 2005).

STAFF

One administrative director, an administrative assistant, six professional technicians including a biologist, two environmental engineers, a geographer, a social communicator, a forestry engineer, 13 park guards in 8 control posts and two drivers (Shoobridge, 2005).The Park headquarters is at Huaraz.

BUDGET

From 1990 to 1998 funding came only from Ancash Department and entrance fees (totalling in 1994 US$65,000 (INRENA pers. comm., 1995). However most of the fees go to INRENA. Funding from local NGOs such as the Ancash Association and international sources, especially Germany, have since boosted this sum. Management costs for 2007 were US$810,949 of which the master plan allots US$219,120 for salaries (Shoobridge, 2005).

LOCAL ADDRESS

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