



DEER SPECIALIST GROUP NEWS

NEWSLETTER NO. 12

June 1994

SOUTH AMERICA

FIRST WORKSHOP ON THE CONSERVATION OF BRAZILIAN CERVIDS

Häns Fradrich
Zoologischer Garten Berlin

This workshop, organized by the Brazilian Zoo Society and the Companhia Energetica de São Paulo was held in São Paulo, Brazil, from August 2-4, 1993. Its main subject was the marsh deer (*Bezoarticus dichotomus*), threatened in Brazil by the construction of some hydroelectric plants. But the workshop also referred to the pampas deer (*Ozotoceros bezoarticus*) and some species of *Mazama*. The main papers read were the following:

"Ecology, behaviour and conservation of the marsh deer in the Wild" (Walfrido Moraes Tomas)

"The Conservation Center for the marsh deer in Promissao" (Rose Lilian Gasparini)

"The marsh deer in the Reserva de Ibera, Argentina" (Marcelo D. Beccaceci)

"Experiences in keeping and breeding the marsh deer at Berlin Zoo" (Hans Frädrieh)

"Morphological and genetic variability in a relict population of Ozotoceros bezoarticus" (Suzana Gonzales)

"Illegal commerce with the fauna of Latin America" (Juan S. Villalba-Macias)

"Ecology and behaviour of the pampas deer in nature" (Laurenz Pinder)

"Aerial census as a method for studies on the conservation of cervids living near the Rio Parana and in the Pantanal" (Guilherme de Miranda Monrao)

"Perspectives of studies on Brazilian cervids" (Jose Mauricio Barbanti Duarte)

"The use of indicators for the characterization of a population of the marsh deer along the lower Rio Tiete" (Maria Cecilia P. Buschinelli)

"Diet of the pampas deer in the Reserva de Vida Silvestre Campos del Tuyu, Bahia Samborombon, Buenos Aires" (Mariano Lisandro Merino)

"Mazama bororo, a new species of Brazilian cervid" (Jose Mauricio Barbanti Duarte).

Some roundtable talks discussed proposals for the conservation of the marsh deer in the wild and in captivity, diseases in cervids, parasites, neonatology in neotropical cervids, and the cre-

ation of a study group for endangered neotropical cervids. The workshop was followed by a 2-day excursion into the interior of the state of Sao Paulo where the participants had the opportunity to study the enclosures and the overall management of a number of marsh deer that had been rescued from hydroelectric inundation of their wetland habitat. For still unknown reasons, the mortality of captive-born juveniles is relatively high. The proceedings of this workshop will be published in due time and hopefully will lead to a better understanding of some species of neotropical deer that have so far been neglected.

New Regional Coordinator for South America

With this issue of the newsletter, Dietland Müller-Schwarz says farewell as coordinator for South America. Dietland has served for almost five years and will continue to be active in deer research in South America. At press time, a new coordinator had not been appointed.

STATUS OF THE PUDU IN ARGENTINA

Dr. Eduardo Ramilio of the Argentinian Park Service recently sent us a summary of information on the pudu (*Pudu pudu*) prepared in response to a questionnaire from the IUCN/SSC Trade Specialist Group. He notes that the species does not appear to be endangered in Argentina where four national parks have been established within the pudu's distribution. The animal is still found throughout its historic range, though populations have been decreasing, particularly in the eastern portion of Argentina where the principal threat appears to be conversion of native habitat to cattle ranches. Successful captive breeding programs have been established in Chile and Argentina. However, little is known regarding the ~~ecology of species in the wild.~~

INVESTIGATIONS ON THE INTRODUCED RED DEER (CERVUSELAPHUS) IN PATAGONIA

W.T. Flueck and J.M. Smith-Flueck, Univ. Nac. Comahue, C.C. 1336, 8400 Bariloche, Argentina

The red deer was introduced to Argentina in the early 1900s. They have since spread over a large area including to the Chilean side and are now found in Patagonia from about 39° to 45° south latitude. Current interest in establishing new hunting parks or deer farms is resulting in continued translocations of red deer to new areas in both countries. We have been carrying out field projects to determine the actual

distribution of free-ranging populations and to monitor selected populations for health and reproductive aspects. Major problems have been identified in relation to the impact on the flora (Veblen et al 1990: Conservation Biology 6(1):71), on the fauna (e.g., on native Patagonian deer *Hippocamelus bisulcus*), and especially on national parks. In addition, where local deer densities are high, red deer also increase the risk for disease transmission to wildlife and livestock. Attempts are being made to coordinate information exchange between researchers from Argentina and Chile and possibly to initiate bi-national research projects. One important objective is to increase awareness at the government level as current legislation in both countries is inadequate to deal with the scope of the commercial and environmental situation.

FIELD SURVEYS OF NON-PROTECTED HUEMUL (HIPPOCAMELUS BISCULCUS) HABITAT IN ARGENTINA

J.M. Smith-Flueck and W.T. Flueck, Univ. Nac. Comahue, C.C. 1336, 8400 Bariloche, Argentina

Presently, national parks are the principal protected areas in Argentina with populations of huemul. During 1992/93 we surveyed several non-protected areas where historic records of huemul have been recorded. In two areas huemul could no longer be confirmed, as introduced red deer had already expanded into these regions. In another area however, a population estimate was made and

basic biological data were collected. Together with other reports of recent sightings this information is being considered by the provincial government in the possible creation of its first reserve for this species. In yet another location, an area surveyed in late summer appeared to be mainly a winter range for huemul as fresh use could only be determined at high elevation. Seventeen remains of dead huemul were found at the low elevations. The date of death is estimated between a few months to 3-4 years. A preliminary analysis showed that fawns of the year and young adults of both sexes were killed by mountain lions or died from undetermined causes. Bone marrow fat content of three individuals was high. Although a disease-related die-off is plausible, the remoteness of the area suggests that these findings may indicate the presence of a substantial population of huemul.

PAMPAS DEER PVHA IN URUGUAY

The Pampas Deer PVHA in La Rocha, Uruguay, was held October 24-30, 1993 and attended by 38 deer researchers and administrators. Among the highlights were: 1) Presentation of an award to José Pedro Castro for protecting pampas deer on his estancia; 2) Development of a population model of pampas deer, guided by Dr. Ulysses Seal, and based on multi-year censuses by Donald Moore and D. Müller-Schwarze; and 3) Report of larger numbers of pampas deer in Brazil than previously assumed.

SSC MEETINGS IN BUENOS AIRES

The Deer Specialist Group was represented by Dietland Müller-Schwarze at IUCN's Species Survival Commission meetings in Buenos Aires, January 15-17, 1994. Maura Beatriz Kufner also participated in the group's report by explaining a particular problem confronting the host country, namely the precarious situation of the pampas deer in San Luis Province, Argentina.

PAMPAS DEER UPDATES

Argentina In November 1993 Dr. John Jackson of the Royal Forestry Society, Great Britain, and an early and productive pampas deer researcher, reported that the estancia with the best pampas deer population in San Luis Province had been sold and subdivided. The area is now more intensely managed for livestock, to the detriment of the deer. In addition, poaching is a severe problem; at least 50 of 250 animals have been taken this way. This disturbing issue was discussed at the SSC meetings in Buenos Aires where Maura Beatriz Kufner of the Córdoba National University presented two plans. One calls for buying 10,000 ha grassland for a reserve. The other envisions capturing pampas deer and relocating them in provincial protected areas. A meeting with participation by all concerned parties, such as government, landowners, hunters, researchers, and conservationists, will be called to coordinate immediate actions.

Brazil During the pampas deer PVHA in Uruguay, Brazilian researchers reported that in a census with some extrapolations, the total number of pampas deer in Brazil had been estimated to be in excess of 20,000, more than previously assumed.

HUEMUL IN CHILE

Dr. Roberto Schlatter, Universidad Austral de Chile, Valdivia, points out that a multidisciplinary task force at his institution plans to address the problems of the huemul (Southern Andean deer; *Hippocamelus bisulcus*), in Chile on the Red List as Endangered Species. Captive breeding is envisioned, and funding is needed.

MARSH DEER CENSUS IN PANTANAL, BRAZIL

Aerial census by Rodney de Arruda Mauro in the course of his Master's thesis yielded an estimated 36,314 marsh deer for the entire Pantanal (140,000 square km), with a density of 0.259 deer per square km. The work was supported by the Centro de Pesquisa Agropecuária do Pantanal (CPAP/EMBRAPA), the WWF, and the Environmental Secretaries of Mato Grosso and Mato Grosso do Sul.

EUROPE & NEAR EAST NEWS

MESOPOTAMIAN FALLOW DEER BREEDING WELL IN CAPTIVITY IN IRAN

In a communication to IUCN, Derek Scott (International Waterfowl and Wetlands Research Bureau, Slimbridge, UK) reports that the captive breeding programme for *Dama dama mesopotamica* is progressing well. The status of the population in 1992 was as follows (cf DSG Newsletter No. 8, 1990 for previous status report): Dasht-e-Naz (160 deer); Ashk Island, Lake Uroomiya (introduced) (80); Semeskandeh, near Sari (introduced) (30).

Smaller numbers occur at various other release points in South and West Iran. A number of deer have been released into their native habitat along the Dez and Kharkeh rivers in Khuzestan, where a few truly wild deer were known to survive at the time of the releases. Further releases are planned in Zagros oak forest in Fars.

NEW PUBLICATIONS

Decoux, J.-P. (1993). Saving the natural diversity of Eld's deer: global herdbook. Pour la sauvegarde de la diversité naturelle de *Cervus eldi*: généalogie internationale. Museum National D'Histoire Naturelle, Paris. 200 pp.

Ohtashi, N. and Sheng, H.-I. (Eds) (1993). Deer of China: biology and management. Elsevier, Oxford, New York, Tokyo. 418 pp.

KOREA PLACES RESERVATION ON MUSK DEER

The Republic of Korea became the 120th Party to CITES on 7 October 1993, but it has entered a reservation for a period of three years on *Moschus* populations listed in Appendix II. Essentially, these include all populations north of the Great Himalayan divide (China, Korea, Mongolia, former USSR); populations to the south are listed under Appendix I.

Musk is used in oriental medicines. It is a key ingredient of Woo Hwang Chung Shim Won medicine balls - a multi-million dollar industry. Most Korean homes have a supply of these medicine balls, which are used for emergencies, such as strokes and children's nose bleeds, as well as a pick-me-up.

Imports of musk to the Republic topped 400 kg in 1991. In 1992 imports totalled 317 kg and were valued at US \$ 4.7 million. At the time that CITES came into force in the Republic, the wholesale price of musk was 40 million won (US \$ 50,000).

Source: TRAFFIC International

SIBERIAN MUSK DEER UNDER CONTINUING PRESSURE

Further to the previous newsletter, Dr V. Prikchodko (Institute of Evolutionary Animal Morphology and Ecology, Academy of Sciences, 117071 Moscow) reports that the Siberian musk deer population is estimated to have declined by 70% in Russia in the last two or three years due to the great demand for musk on world markets. Some protective measures have been taken. The island population of *M. moschiferus sachalinensis* is listed in the Russian Red Data Book, and hunting of musk deer has been banned for three years throughout the Altai. Some conservationists believe that hunting should be completely banned.

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HIMALAYAN MUSK DEER FACESEXCESSIVE POACHING

Following a 170 km trek in the Gangotri region of the Garhwal Himalaya, the acclaimed leader of the Chipko movement, Sunderlal Bahuguna has drawn attention to the unchecked activities of poachers in such remote areas. He reports that the musk deer (*Moschus chrysogaster*) is facing extinction in the region due to excessive trapping by poachers.

Source: The Statesman, Calcutta 14 June 1993

A New Species of Muntjac in Lao PDR

A new species of muntjac *Muntiacus* sp. has recently been found in Lao PDR, by scientists from The Wildlife Conservation Society, working in conjunction with the National Office of Nature Conservation and Watershed Management. During the January-April 1994 survey of the Nam Theun National Biodiversity Conservation Area (NBCA), over 50 trophies of the new muntjac were found along side those of *M. muntjak* in local villages. The scientists had originally been alerted to the possibility of a new species when a year earlier a similar trophy was found in a village adjacent to the Phou Xang He NBCA. In March 1994 the team, by chance, came across an adult male of the new species captive in a private menagerie close to the NBCA, allowing more critical comparison with sympatric *M. muntjak*. There have also been two field sightings of two females. The

discoverers hope to formally describe and name the new species in the near future. It will be an excellent flagship for forest protection in the Lao PDR, which is now establishing an impressive system of protected areas to safeguard its great natural wealth. The PDR has long been understudied in comparison to neighboring countries, but modern surveys are demonstrating a richness of rare and localized species to rival any in South-East Asia. More remarkable biological surprises can be anticipated.

Males of the new species have much larger and strikingly different shaped antlers from those of *M. muntjak* and indeed all other *Muntiacus* species. In both sexes the body size is apparently larger and they differ in a number of pelage characteristics, most notably, a contrastingly darker dorsum and a dark upperside to the tail. The new species of muntjac appears to be widespread and numerous in the c. 3500 km² Nam Theun NBCA and is likely to occur elsewhere in central Lao PDR. The species is widely hunted, though at present it is not acutely threatened. The recent designation of seventeen NBCAs in the country, at least 5 of which are likely to be within the new species range, will hopefully secure its future.

Submitted by: Rob J. Timmins and Tom D. Evans (Vientiane, Lao PDR)

NEW SPECIES OF DEER IN VIETNAM?

In December 1992 Vietnamese scientists found ten pairs of antlers from a species of deer never previously seen in Vietnam reports Professor Vo Quy (Centre for Natural Resources Management and Environmental Studies, University of Hanoi). The team was surveying Pu Mat in south-western Nghe An. This lies north of Vu Quang Nature Reserve where a possibly new species of bovid has been discovered.

SANGAIPHVA WORKSHOP

The sangai or Manipur brow-antlered deer (*Cervus eldi eldi*) was the subject of a population and habitat viability analysis at the first ever regional meeting of the IUCN Captive Breeding Specialist Group in India. The meeting followed the Centenary Celebrations of the Mysore Zoological Gardens in October 1992, and the draft report from the workshop appears in the May 1993 issue of Zoos' Print.

An estimated 76-100 wild sangai survive in a single population in Keibul Lamjao National Park, Manipur. Based on the PHVA, it is predicted that there is a 43% likelihood this population will become extinct in the next 100 years. A main recommendation is to produce a surplus of captive deer for establishing a second population in the wild, ideally within the historical range of this subspecies.

NEPAL'S BARASINGHA POPULATION INCREASING

The Royal Sukla Phanta Wildlife Reserve holds the largest population of barasingha (*Cervus duvauceli duvauceli*) in Nepal. The population has been increasing at a mean annual rate of nearly 8%, from 1,279 in 1988 to 1,854 in 1993. There is now concern as to whether or not the population has reached its carrying capacity in the main grazing grounds. Certainly, water appears to be a limiting factor towards the end of the dry season.

The proposed eastern extension to park would ultimately provide more grassland habitat for the population, but it is isolated by an irrigation canal currently under construction. The impact of the canal on animal movements was taken into consideration in the design of the structure.

Source: Henshaw, J. (1993). Report for the International Union for the Conservation of Nature (IUCN) on the status, trend and management problems of the barasingha of Suklaphanta Wildlife Reserve. Unpublished. 14 pp.

MUSK DEER IN NEPAL

Funding has been obtained from the Australian Centre for Agricultural Research (ACIAR) to examine the feasibility of establishing a musk deer farming industry in Nepal. Dr. A.W. English from Sydney University is working with the Chief Ecologist of the Nepalese Department of National Parks and Wildlife Conservation (DNPWC), Dr. Bijaya Kattel, who carried out his Ph.D. studies on the Himalayan musk deer.

A Deer Research Unit has been constructed at Godawari on an initial area of 1 Ha, although 10 Ha has been allotted for the project. Fencing materials were sent by sea from New Zealand to Calcutta, and then overland to Nepal. A DNPWC veterinarian (Dr. Kamal Gairhe) recently spent 5 weeks at the University of Sydney's Deer Research Unit at Camden NSW, for intensive training in deer management and handling, and he will be responsible for the activities at Godawari. A period of initial training and development will involve both chital and muntjac deer, with no musk deer being trapped until this is completed. More detailed information on what is proposed will be provided later.

DEER HARVEST IN SIKHOTE-ALIN, RUSSIA

Established as a biosphere reserve in 1978 and covering 3,402 sq. km, Sikhote-Alin Zapovednik supports large populations of various ungulates which are harvested at sustainable levels. These include the following cervids:

<u>Species</u>	<u>Est. density</u>	<u>Legal ann. harvest</u>
Red deer	0.8-2/sq.km	100 individuals
Roe deer	1-12/sq.km	40 "
Sika deer	0.5-3 /sq.km	
Musk deer	1-5/sq.km	70 "

Up to 450 persons are involved in hunting and limited to a total annual harvest of 300 ungulates, the balance being made up of wild boar (80)

Source: G. Gonzalez (1993). Status of wild ungulates in the biosphere reserve "Sikhote-Alin" (Russia) - interactions with domestic stock, large carnivores and human activities. Institut de Recherche sur les grands mammiferes, Toulouse. Project proposal.

DEER FARMING IN AUSTRALIA

**A.W. English,
University of Sydney, Camden
2570, NSW, Australia**

The deer farming industry in Australia is still having considerable difficulty in achieving consistently good markets for venison, although efforts at the national level to develop both the domestic and export markets are continuing. A new element in the situation is the arrival on the domestic market of kangaroo meat, which can now be legally offered for human consumption in all states. It remains to be seen whether this will present serious competition for sales of venison, but there is not an unlimited market for red meat in Australia.

The New Zealand deer industry has adopted the term "Cervena" to describe fresh, farm-killed venison, and this will be used in marketing the New Zealand product in a number of countries. The main reasons for moving away from the use of "venison" are a perceived need to differentiate the farmed product from wild-shot venison, and a decision to place less emphasis on the fact that venison comes from deer (the "Bambi syndrome").

Velvet antler harvesting has been very much in the news in both Australia and New Zealand, in that moves by deer farmers to secure access to the drugs required for the humane removal of velvet antler have not met with universal approval. After a considerable amount of discussion in New Zealand there is now in place an accreditation scheme which will see deer farmers trained by veterinarians to harvest velvet antler from their own deer. There is a comprehensive training and testing program for deer farmers who seek accreditation, with this process now just beginning.

Similar training programs have been conducted in two Australian states (Western Australia and South Australia),

despite the fact that it is current Australian Veterinary Association policy that all velvet antler should be cut by veterinarians. Recent attempts to establish a national training and accreditation scheme similar to that now in operation in New Zealand have not met with much support from the veterinary profession, and it seems likely that the AVA policy will stay as it is. However, in all states but New South Wales individual veterinarians can prescribe the drugs xylazine and xylocaine if they choose to do so.

In NSW the Veterinary Surgeons' Board has ruled that only veterinarians can administer anaesthetic drugs, which precludes deer farmers from cutting velvet from their own deer. Boards in other states may follow suit.

RATIONAL USE OF AUSTRALIA'S WILD DEER

Wildlife in Australia has been traditionally lumped into two categories, native (sacred, and therefore not to be used in any way) and introduced (vermin, and therefore to be destroyed whenever and however possible).

Recently it has become apparent that this simple division produces some strange and indefensible results and that wildlife species need to be used by the community to the best advantage of people, the environment and the wildlife itself. For example, this sudden rush of reality has resulted in kangaroo meat now being available in all States for human consumption, rather than being used to feed dogs and cats or discarded. Another result is that options for managing feral animals such as goats, horses, donkeys, buffalo and camels are also being examined.

The deer hunting fraternity in Australia is hopeful that this country's six wild deer species (hog, fallow, chital, rusa, red and sambar) will also benefit from changing attitudes and more rational government policies and that all deer species in all States and Territories will be managed in perpetuity as a hunting, wildlife and farming resource.

U.S. GAME BIOLOGIST EMPLOYED IN TASMANIA

**Ken Slee
Australian Deer Association
Bairnsdale 3875, Australia**

The Tasmanian Deer Advisory Committee (TDAC) has recently employed Mr. Brian Murphy, a wildlife biologist from Georgia in the U.S. as a project officer to recommend and develop strategies for the maintenance of Tasmania's wild (but non-native) fallow deer herd in a high quality state, in harmony with farming and environment, and managed for sustainable harvesting. Employment is initially for a period of two years and it is hoped that funds will become available for a third year's work.

The TDAC is made up of farming (including deer farming) and hunting groups and also includes a number of government departments. Funding derives from royalties paid by deer farmers trapping fallow deer from the wild to stock deer farms.

In recent years it has become apparent that the Tasmanian fallow deer hunting and management scene is less than ideal, with high levels of poaching, conflicts between farming interests and hunters, instances of serious crop damage by deer, lack of coherent management policies and an excessive harvest of young bucks from the herd.

It is hoped that Brian, with his background in game work, and recent involvement with "quality deer" management in Georgia, will help to resolve many of Tasmania's deer management and hunting issues.

A SYMPOSIUM

THE SCIENCE OF OVERABUNDANCE: The ecology of unmanaged deer populations

Meeting Date & Site:

November 10 & 11, 1994;
Conservation & Research Center
Front Royal, Va

Organizers:

Bill McShea, Brian Underwood,
and John Rappole

Sponsored by:

Smithsonian Institution
National Park Service

In the decade since the last CRC symposium on the biology and management of deer was held, deer populations throughout the country have garnered much attention, particularly in areas where traditional management methods have been deemed ineffective or inappropriate, and population sizes have grown appreciably. Much of our current conservation efforts in North America focus on protected areas of land which contain these 'unmanaged' populations of deer. Some of these populations are viewed as overabundant in the context of other land management objectives. However, management objectives and techniques are always changing, as technology and public interests evolve. Any management plan will be ineffective, without a much better understanding of how these unmanaged deer populations are regulated and how they interact with other organisms at landscape, regional and ecosystem scales.

Most of what we have learned about the demography and ecology of deer populations over the last 50 years has derived from management systems that emphasize productivity. The health of a deer herd has been traditionally defined in terms of maximum sustainable harvests, and management objectives have been set according to accepted 'norms' of physical stature and well-being. Some of these criteria may not hold for all deer populations, as many high density populations appear

to be demographically stable, or exhibit extended time lags between habitat degradation and population decline. The demographics of high density populations warrant study, not as an aberration of low density populations, but as an example of the interaction between life history traits and population density.

From an ecosystem or landscape perspective, the aim of our symposium is to examine North American deer species as a dominant group of vertebrate herbivores that, by virtue of their abundance, functionally fill 'key-stone' positions in many ecosystems. As such, they offer excellent opportunities to study the interaction between demography and habitat characteristics at different temporal and spatial scales. For example, the occurrence of locally abundant populations within a matrix of unsuitable habitat or managed populations may be considered a metapopulation with regards to dispersal and gene flow.

We have invited ecologists from all over the country to examine the role deer play in shaping and changing habitats, landscapes and ecosystems. The studies emphasize what is new to be learned from these high density populations, and provide insights into the biotic impacts that change in deer numbers and distribution imposed on the ecological community. Bringing together this research will allow for informed management decisions, based on understanding of the unique ecology of these populations.

SCHEDULED SPEAKERS ARE

Introduction

C. Wemmer
D. McCullough

History of Deer in U.S

T. McCabe
M. Knox

Behaviour & Genetics

G. Schwede
K. Miller
N. Mathews

Demographic comparisons

G. White
G. Storm
D. Whittaker
W. Porter
A. O'Connell
D. Harrison
A. Denicoln
W. Davidson

Impacts of high density populations on species

W. Alverson
D. Waller

Impacts of high density populations on ecosystems

M. Bowers
W. McShea
S. Seagle
W. Healy
O. Shritz

Modelling Population Dynamics

B. Underwood

Landscape scale considerations

L. Hanson
J. Cooke
K. Risenhoover

Logistics: The Symposium will be held November 10 and 11, 1994. Meals can be provided at the Center (\$50). There are hotel rooms in town (2-3 miles) for those interested in accommodations. We will run a shuttle van to Dulles International Airport the evenings of November 9 and November 11 (\$10 round trip) and the morning of November 12. We will hold a welcoming social November 9, beverages and snacks at breaks, and breakfast, lunch and dinner on November 10 and 11. The symposium will be open to non-speakers at a cost of \$80 (\$40 students). This will include the welcoming social, beverages and snacks at breaks, and abstracts of talks. A meal plan will be available for these registrants, but they will be responsible for their own housing. We have seating for 100 in the auditorium so the number of registrants will be limited to about 60. Registrants would also be offered a published volume at cost. Talks will be scheduled from 8:30 to 4:30 each day, and will include a panel discussion at the end of the second day. Contact Bill McShea (703-635-6563 or FAX 703-635-6551) for registration material.

Status of the Columbian White-tailed Deer

James Peek
University of Idaho
Moscow, ID 83843

Since the last status update in 1992, there has been significant progress toward the recovery of the Columbian white-tailed deer. Overall deer numbers have been relatively stable over the last two or three years and are more than adequate to meet the goals of the Recovery Plan. Recovery efforts are focused on securing habitat for each of the populations.

Lower Columbia River Population: This population continues to inch closer to recovery. It will qualify for delisting when sufficient habitat of at least one of the two off-refuge subpopulations is protected in a legally binding and relatively permanent manner. Present efforts are directed at protecting habitat of the Westport/Wallace Island subpopulation. Principal accomplishments during the last two years are as follows:

The Nature Conservancy purchased 168 Ha of deer habitat on Wallace, Anunde and Kinnunen Islands with the intent of selling to the U.S. Fish and Wildlife Service. This land will almost certainly become part of the Julia Butler Hansen Refuge for the Columbian White-tailed deer in 1994.

The U.S. Fish and Wildlife Service issued a final environmental assessment for habitat acquisition. The preferred alternative calls for protecting about 710 Ha by means of a combination of conservation easements and fee title acquisition.

The Service's FY 94 budget included \$500,000 for the above purpose. This is not enough money to complete the job, but it is, at long last, a start. Land purchase negotiations are presently underway.

The Service and the Oregon Dept. of Fish and Wildlife entered into two cooperative agreements with James River Corporation establishing Cooperative Wildlife Management Areas on nearly 700 Ha of white-tail habitat. James River is presently growing short-rotation cottonwoods on most of this land. They will modify their operations to reduce impacts on the deer and preserve remaining areas of natural woody vegetation.

Funding of \$10,000 was obtained for the Service share of a \$20,000 Partners for Wildlife habitat restoration project with James River Corporation. Native trees and shrubs will be planted on scattered plots within James River's cottonwood plantation to provide permanent cover and food for deer and other wildlife. If additional funding for land acquisition is approved in FY 95, this population could qualify for delisting in the near future, possibly by 1996.

Roseburg (Douglas County) Population: This population grew rapidly during the 1980's and is presently estimated to contain 5,000 - 6,000 individuals. The major stumbling block to recovery has been a lack of secure (legally protected) habitat. Virtually all of the habitat was privately owned. Recently, the U.S. Bureau of Land Management purchased a 2,630 Ha ranch located in the heart of the white-tail range for the purpose of preserving and securing

Columbian white-tail habitat. If this ranch supports an average of 500 or more deer, the Recovery Plan goals will have been met and the population can be delisted. Oregon Department of Fish and Wildlife biologists are planning intensive surveys of the area to obtain a reasonably precise estimate of deer numbers. There is reason to think the area does support at least 500 deer on a continuing basis, therefore, this population may be very close to recovery and subsequent delisting. The Bureau of Land Management is also negotiating the purchase of an additional 1,012 Ha of white-tail habitat, which, if secured, would more than meet the requirements for delisting.

Summary: Both populations of Columbian white-tailed deer grew in size during the last decade. The lower Columbia River population is estimated at 700-900 distributed in four roughly equal subpopulations, while the Roseburg population is estimated at 5,000-6,000. These numbers are believed adequate, however, habitat security has been insufficient. It is within the purview of habitat security that major strides toward the recovery of the subspecies have been made during the last two years. About 2,630 and 168 Ha have been secured by acquisition in Douglas County and the Lower Columbia, respectively, and more is expected. It is likely that at least the Roseburg population, and perhaps both populations, will be eligible for delisting in the very near future.

Woodland Caribou

Wayne Wakkinen
University of Idaho
Moscow, ID 83843

Field activities in the Selkirks are focusing on two major objectives. The first is the development of a reliable census technique to allow the tracking of the population through time without the benefit of radiocollars. A method has been developed that involves a 2-stage sampling scheme. The entire area is flown with a helicopter to count individual animals. The presence of radioed caribou in the ecosystem has allowed us to statistically validate the technique. Currently, we are 90% confident we are detecting at least 90% of all groups of 4 animals or more. We have little information on small group detection rates because of small sample sizes.

We have conducted the survey for the last 3 years. In 1991 and 1992, 47 animals were detected. In 1993, 51 were counted. Recruitment was 15% in 1991, 8% in 1992, and 14% in 1993. The survey has not been conducted yet this year due to poor flying conditions. The other objective is to quantify causes of mortality. A significant number of animals were killed in August and September. While many have been attributed to predators, primarily mountain lions, many others have gone into the "unknown" category because of the condition of the carcass by the time we detected the mortality and investigated the scene. We flew more frequently during August and September in an attempt to detect the mortalities sooner, and thus have a better chance of determining the cause of death.

We recently updated and revised the caribou Habitat Suitability Index (HSI) model using the latest habitat analysis information. The revised HSI incorporates site-specific information from Selkirk caribou and thus probably better reflects the need of this population. We also plan to revisit the current caribou habitat management guidelines and update those where necessary.

Sixty animals were transplanted

into the Idaho portion of the Selkirks from British Columbia in 1987, 1988, and 1990. As a result a second herd is now established in the Selkirks. The revised Recovery Plan recommends a second transplant to establish a third herd. Washington has applied for a Section 6 grant from the U.S. Fish and Wildlife Service to conduct the augmentation. The status of that request is unknown right now. If the money is received, planning would likely be conducted this year, and the actual trapping and transplant would take place in February or March of 1996.

South-Central Queen Elizabeth Islands, Northwest Territories, Canada

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Ongoing investigations by the Canadian Wildlife Service (CWS) indicate that Peary caribou within the Bathurst Island complex, south-central Queen Elizabeth Islands, Northwest Territories, experienced a favourable winter from 1992 to 1993. The good overwinter nutritional state of the pregnant female caribou led to a very high level of births in June 1993. Most importantly, the favourable weather and forage conditions have resulted in an extremely high early survival of the caribou calves throughout summer 1993. CWS biologists found that for every 100 females that produced calves in June on average 97 of them still had a calf in their company during late August 1993. This 97% early survival of calves is an exceptionally favourable condition for an animal who's annual crop of newborn young often suffers 30 to 50% losses from June to the end of July of many years, and in some years, experiences near or total annihilation due to extremely harsh environmental stresses on the pregnant mother and fetus throughout winter and additionally, sometimes directly upon the newborn young at or shortly after the time of birth.

After 6 consecutive years of investigation from 1988 onward within the Bathurst Island complex, CWS researchers are convinced that the Peary caribou population on the south-central Queen Eliza-

beth Islands has more than doubled in size during the 5 years from 1988 to 1993. This significant gain is still, however, only about 75% of the estimated 1961 population size of 3565. The current status of Peary caribou on the remainder of the Queen Elizabeth Islands is unknown and similar increases cannot be assumed, because environmental conditions can be highly variable among the High Arctic Islands.

The remoteness of the Queen Elizabeth Islands and the great costs of carrying out environmental conservation studies in that region of the world has resulted in minimal detailed ecological investigations of Peary caribou. In fact, it has only been through the continual high level of support from Polar Continental Shelf Project (a Federal agency of the new Department of Natural Resources), that CWS has been able to carry out the studies

in the 1990's. In cooperation with the Wildlife Service, the Canadian Wildlife Service and the Alberta Environmental Centre initiated a "hi-tech" study of the year-round distributions, movements, and seasonal migrations of Peary caribou within the Bathurst Island complex. The Alberta Environmental Centre provided the services of a senior wildlife technician who is an expert in the capture and restraint of caribou to capture Peary caribou by the use of an aerial net-gun technique. Due mainly to the cooperation and expertise of the Alberta Environmental Centre staff, 17 Peary caribou were successfully captured and fitted with telemetry neck collars. All of the collars contained VHF radio packages and 7 of the collars also housed Satellite Platform Transmitter terminals. Of greatest value, will be the first time ever collection of year-round distribution and movement information on Peary caribou. This will be the first time that biologists have been able to obtain year-round, especially wintertime, information on how Peary caribou use their range on the Queen Elizabeth Islands. This is a particularly important step forward in providing possible mitigative measures to counteract any future land use activities on the Canadian Arctic Islands that might prove detrimental to the future wellbeing of Peary caribou.

SURVEY ON LARGER MAMMALS IN BAWEAN ISLAND

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The Bawean deer, *Axis kuhlii*, is one of the most unique of the large mammals on Bawean Island. The distribution seems to be limited to Bawean Island (WWF 1979). This population is declining rapidly and the species is threatened because of habitat degradation and hunting by local people. Therefore, this animal is included in the list of strictly protected animals (IUCN 1972). The animal has been placed in a sanctuary on Bawean Island which has an area of about 4500 ha that was declared by the Indonesian Department of Agriculture in 1979.

Very little is known from recent publications on the status, distribution, natural history, and habitat of the deer on Bawean Island. Hence, the population status of this animal is unknown, and the information available on the species comes from old publications (Hoogerwerf 1966; Sitwell 1970) and work in the 1980s (Blouch).

We made a brief visit to survey the larger mammals in certain areas of Bawean Island, specifically in and around the islet reserve, to determine the existence of Bawean deer (*Axis kuhlii*), wild pig (*Sus verrucosus*), and long-tailed macaque (*Macaca fascicularis*). Field work was undertaken from 15 July to 31 July 1991 in the western part of the island in collaboration with the Indonesian Wildlife Operation (IWO) and the Zoological Society for the Conservation of Species and Population (ZSCSP).

Survey Area: Bawean Island is located on the Javan sea between East Java and Kalimantan, approximately 100 km north of East Java. This island has an area of about 200 sq. km. Administratively, the Bawean deer exists within 2 local districts: Sangkupura district

that lies in the south of the island and composed of 17 villages, and Tamba district that lies in the north of the islet and composed of 13 villages.

The Bawean Island habitat, particularly that of the game reserve and its surrounding area, is described as primary.

Survey Methods: We interviewed local villagers and staff rangers on the Bawean reserve and walked to several different field sites to gather information on the presence of Bawean deer. The survey area included small villages in southern (Tampo), eastern (Sumber nanas), and western (Candi) parts of the game reserve (see map Figure 1).

Human Pressure: Most of the area surrounding the protected area is inhabited by fishermen and farmers with established groves and farms. The human existence in this area makes the habitat unsuitable for the endemic wildlife population. This is because most of the people that live in the area continue to illegally cut trees for housing and cooking, and are also exterminating any animals that pose a threat to their crops. The surrounding population lacks the knowledge necessary to conserve the wildlife found on the islet.

Bawean Deer (*Axis kuhlii*): Rangers, villagers, and previous visitors to the reserve have reported seeing deer in abundance in certain areas (near food sources). We did not see any deer when we walked the trails where sightings were reported, although there is still good forest that is suitable habitat for them. The existence and status of the deer was determined by finding and studying tracks and feces, whistling, sighting, and examining signs on trees or other vegetation. We found some tracks, feces, and tags on trees near the dense canopy forest. It appears that the Bawean deer has declined in this islet since the last study was undertaken. The wild dog, which enters the forest

often, may be contributing to this decline since it preys on the animals of the forest, including the deer.

Wild Pig (*Sus verrucosua*): This animal is a well-known crop raider which lives in large groups. Most villagers do not like the wild pig, therefore they constantly hunt or trap the animal. The wild pig's distribution ranges from Indonesia to Kalimantan, Sumatra, Java, Sulawesi, Irian, and other small islands.

The wild pig and the Bawean deer require similar habitat, but a considerable amount of the deer habitat is overlapped by the wild pig. There is no food competition between the two species, but they always seem to be in territorial conflict.

Long-Tailed Macaque (*Macaca fascicularis*): We saw a group of Macaca searching for food in the forest at Kastoba Lake near Candi village. The macaque seems to prefer secondary forest near villages to the primary forest. The habitat varies among secondary forest, gardens, riverine forest, primary forest, and the forests around the lake.

This primate has not been included on the list of protected animals, and as a result is constantly hunted by the local people who consider the macaque to be a "disease" for the local farmers.

Conclusion:

- Human activities surrounding the reserve are reducing the remaining forests, making it difficult for the population of large mammals to survive on Bawean Island.
- Predation by the wild dog is another possible factor in the decline of the Bawean deer.
- The wild pig and long-tailed macaque are still abundant on the island.

Bawean Island (continued)

- No information was found relating to animal trade issues on the islet.

- Little information has been gathered concerning the large mammals of Bawean Island. We suggest that an intensive study be undertaken on the natural history of the Bawean deer, wild pig, and long-tailed macaque to determine their status and aid in producing a management plan for the deer.

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National Park is pushing for its de-listing to enable the species to be harvested throughout the province subject to a management regime.

Wasur National Park, covering 4,123 sq.km, supports an estimated 8,110 rusa deer (1992 census). This is markedly higher than the previous year's estimate of 7,225, when it was considered that the population could crash because poaching was accounting for more than the annual increment. This improvement is due to strong enforcement measures introduced late in 1991.

Source: Franzmann, A.W. (1991). Wild deer management in the Wasur National Park. WWF Project 4553 - Development of Wasur National Park. Unpublished. 24 pp.

Six month progress report for Wasur IDO105 - January to June 1993. WWF Project IDO105/Indonesia - Development of Wasur National Park. Unpublished. 3 pp.

RUSA DEER HARVESTED BY TRADITIONAL MEANS IN WASUR, INDONESIA

Harvesting rusa deer, *Cervus timorensis*, and developing a market system for its meat is one of several initiatives underway in Irian Jaya's Wasur National Park to bring benefits to the local communities. In 1993 some 2,250 deer provided villages with a total annual income in excess of US \$ 51,000. The marketing system is operated by the National Park Bureau, an NGO established specifically to deal with socio-economic aspects of park management.

Although widely distributed throughout much of Indonesia, the rusa deer was introduced to New Guinea. It is a protected species in Irian Jaya, but the WWF project concerned with developing Wasur

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