STATUS OF RARE AND FERAL DOMESTIC ANIMAL STOCKS IN CANADA AND THE UNITED STATES

La situación de poblaciones raras y salvajes de animales domésticos en Canadá y los Estados Unidos

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CANADA

Origin of Genetic Resources:

Nearly all of the domestic animal stocks in Canada and the United States have been introduced from the Old World during the past 400 years. Historically, the introductions occurred in several distinct waves of importation. Some descendants of these importations have retained their identity, and now represent isolated sub-populations of the parental stocks in other lands. Except with poultry, animal breeders have made relatively little effort to establish new and distinctive breeds in North America, preferring instead to retain the characteristics of the ancestral stocks.

Only three species were domestic in North America before recorded history. Dogs were widely kept by the Indians and Inuit before European exploration and colonization began. Most of them have been lost or absorbed by the introduced breeds, but there is intensive activity to maintain and preserve one stock, the Canadian Eskimo Dog, as it existed before European influence. Turkeys and muscovy ducks had been domesticated in pre-historic times in Mexico and Central America but their introduction to northern countries is presumed to have been via the Old World.

Spanish conquest of the Americas was intensive during the sixteenth century. Horses, donkeys, cattle, swine, sheep, and goats were introduced in large numbers to provide transportation, draught, and food resources. Descendants of some of these imports have retained their identity, either as pure breeds or as feral populations. Notable among them are mustang horses, Texas Longhorn cattle, Spanish goats, and Navajo sheep. They exist predominantly in the southwestern United States within the sphere of historical Spanish influence.

Colonization of eastern North America by the French and British occurred during the seventeenth and eighteenth centuries. Some isolated remnants of their stocks remain where they were first introduced; Canadian breeds of horses and cattle, and Milking Devon cattle are examples.

During the nineteenth and early twentieth centuries, expansion of settlement to cover the entire continent progressed rapidly under predominantly British influence. Modern livestock breeds were well-developed in Britain by then, and were imported in large numbers to become the dominant livestock breeds of North America. Some breeds of sheep and swine, now rare in their homeland, have remained popular in North American commercial production. Although poultry stocks were imported from Britain and from other parts of the world during this time, there was intensive activity towards development of distinctive American breeds, particularly of chickens, to meet local needs and circumstances.

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Finally, during the past two decades, there has been another gigantic wave of germplasm importation from Europe. This has stressed the so-called "exotic" breeds of cattle to be used for cross-breeding in the North American beef industry. Large numbers of both major and minor breeds have been imported, particularly from France, Switzerland, and Germany. Although the "exotic" boom has mainly involved cattle for meat production, there have also been importations of sheep and swine stocks. These sub-populations may in the future serve as a germplasm resource for their homelands, as the numerically dominant breeds from nineteenth century Britain have already done.

Conservation Activity and Prospects:

Perhaps because of relatively recent importation, and because most recognized breeds evolved elsewhere, there has been very little interest in North America in the purposeful conservation of rare domestic stocks. There are isolated instances where both interest and activity are high, but the general attitude toward conservation is one of indifference. Despite this, it is worth examining the kinds of reserves which exist and the activity surrounding them.

1. Governments and public agencies -

In a recent survey of poultry genetic resources in Canada (Crawford, 1980), it was concluded that conservation of stocks must become the responsibility of public agencies and governments if endangered stocks are to survive in the long-term. Commercial primary breeders of poultry are maintaining genetic reserves for their future needs, but for business reasons they are planning only ten years in advance. Hobbyists maintain the vast array of exhibition poultry stocks, but their hobby stresses competitive showing rather than breeding and selection so that the genetic base for fancy poultry breeds is probably very narrow. A similar observation was made by Skinner (1974) in the United States. Middle-level stocks for farm-flock production have nearly disappeared in Canada. Thus far, governments and public agencies have shown little interest in ensuring conservation of these resources.

Perhaps these bodies should likewise be charged with responsibility for conservation of domestic mammals, but they likewise have not yet taken strong action. The only example which has come to light is the role played by the government of the province of Quebec in selective breeding of Canadian horses and Canadian cattle; their work with horses was terminated in 1981 but it continues with the cattle breed (Roney, 1982).

2. Rare breeds societies -

In some countries, organizations of private individuals have been formed with the object of promoting the conservation of all rare breeds of livestock and poultry. The Rare Breeds Survival Trust in Great Britain is perhaps the best known of these. It has been immensely successful in identifying and publicizing those stocks which are endangered and in directing action toward ensuring their safe continuity. It has a large and active membership, both in Great Britain and internationally.
A somewhat similar organization, the American Minor Breeds Conservancy, was begun in the United States in 1977. It was modelled after the British club. Its primary concerns were with cattle types in the New England area, but it also sought information on rare stocks of other livestock species. Unfortunately, the organization did not make much progress and it now appears to be defunct (Sponenberg, 1981).

The Society for Preservation of Poultry Antiquities has been in operation in the United States for several years (Rice, 1980). Its large membership is concerned with maintaining breeds and varieties of all poultry species which have become endangered. It sponsors a competitive show each year as a means of encouraging the conservation of these stocks, and it publishes newsletters regularly. While the Antiquities group appears to have been moderately successful, it can be questioned whether all of their rare breeds are purebred descendants of the original breeds or whether they are a new synthesis, since with poultry it is relatively easy to simulate breed phenotypes by judicious combination of major genes. But at least some of the stocks are certainly pure descendants of the originals.

3. Individual breed societies -

It is a usual tradition for those interested in a particular breed to form a society whose objectives are to promote that breed and to direct its development. Nearly all recognized breeds of livestock in North America have such organizations, and some breeds have several. They represent an important mechanism for ensuring the continuity of minor breeds. Examples are breed societies for Dutch Belted, Texas Longhorn, and Canadian cattle, and those for many sheep and swine breeds. However, breed societies are not always able to prevent extinction of a breed, as seems to have happened with the Mulefoot pig and the American Cream Draft horse (Sponenberg, 1981).

4. Parks and zoos -

Parks as nature preserves, and zoos, can sometimes provide living space for domestic animal species, especially if the stocks are both rare and attractive to the public. Where such animals are kept, their numbers are usually small, but they do provide a breeding nucleus. An inventory of such colonies was begun a few years ago at the urging of the Food and Agriculture Organization of United Nations, but it has not reached publication.

Two large herds of Texas Longhorn cattle are maintained by the United States government in public parks (Buchen, 1982). One herd was established in 1927 at the Wichita Mountains Wildlife Refuge in Oklahoma, and a few years later another was established at the Fort Niobrara National Wildlife Refuge in Nebraska. These herds served as important reserves over many decades when commercial cattlemen had no interest in the breed. At the present time, Texas Longhorns are being used very widely in North America for cross-breeding, particularly on young heifers of the beef breeds to avoid problems with dystocia, and hence the immediate future of the breed seems secure.

Examples of rare stocks on display in zoos are readily found. A flock of Soay sheep was kept at Assiniboine Park Zoo in Manitoba until recently and has now been dispersed to four smaller zoos (Roots, 1982). There are some Poitou

5. Feral populations -

Feral populations are of continuing interest to people concerned with conservation of genetic resources. If there is validity in prediction of future need for animals that can produce and reproduce under minimal care, then feral stocks might represent a valuable source of germplasm.

McKnight (1964) conducted an extensive survey concerning feral stocks of domestic animals in the United States and Canada. His study revealed that large numbers of horses and donkeys run wild, particularly in south-western United States; feral pigs are prevalent throughout south-eastern United States; feral goats have established strong populations when sheltered from severe cold and from predators, but cattle and sheep have seldom been able to persist in the wild. McKnight's (1964) study is inevitably out-dated now and should be revised, but it remains as an important document since it draws attention to a genetic resource which is too often totally overlooked.

Feral populations generally persist only at the whim of man, and their existence is precarious. They may be protected if they exist on public property. For instance, feral horses and donkeys on public lands in the United States are protected by law (Ryden, 1970), as are the feral horses on Canada's Sable Island (Armstrong, 1981). Other populations may exist only by chance or because they inhabit areas not readily accessible to man. McKnight (1964) speculated that feral populations will persist for a time but eventually most of them are doomed because of encroaching civilization.

Status of Conserves and Conservation by Species:

No attempt is made in this report to provide a complete inventory of stocks which are being consciously conserved or which need conservation activity. Those listed include breeds which are well-known to workers concerned with germplasm resources, and some stocks which have not previously been identified as rare or endangered. There are others which have been omitted because no information on status could be obtained. In all cases, the information provided is incomplete or only fragmentary at best. There seems to be a pronounced reluctance on the part of individuals and organizations to reveal information which would indicate that their breeds or species should receive special treatment at the hands of conservationists. It is suggested that there is a need for preparation of a complete inventory so that conservation activities, however sporadic they may be, can increase their effectiveness.
1. Horses (*Equus caballus*) -

Horses play a very minor role in agriculture of present-day North America. Very few are used for draught and their use in cattle herding has declined markedly during the present century. There is a strong taboo against use of horse meat for human consumption. Their greatest use is in recreation, a use which has multiplied dramatically with increasing affluence of the human population. Five stocks warrant mention in the context of this review.

a) Mustang and derivatives - Horses introduced by the Spanish during the sixteenth century were the foundation for mustang and derivative breeds in western North America. Several organizations are active in perpetuating the pure mustang (Ryden, 1970). Existing numbers of animals are not known but the breed is no longer considered to be rare. Feral horses in western areas are plentiful and vigorous according to McKnight's (1964) survey, and those on public lands in the United States are now protected by law (Ryden, 1970); since public sentiment for them is very high, the populations are likely to persist in the immediate future. They are variable in origin but probably most of them are based on mustang origin, providing a strong reservoir for preservation of mustang genes.

b) American Cream Draft - This breed is considered to be extinct (Sponenberg, 1981). It was a color variant in animals derived from the major draft breeds, resulting in horses with pale blue eyes and a cream-colored coat. The breed never achieved prominence although it received considerable publicity during the 1950s. Its centre of strength was in the mid-western United States.

c) Sable Island horse - Sable Island is a sand bar in the Atlantic about 300 kilometres from the coast of Nova Scotia. It is best known as a notorious hazard to shipping. The island supports a population of about 250 feral horses. They may be survivors of Portuguese or Spanish shipwrecks dating to the 1500s. The present population dates from at least 1739 when animals were introduced from New England. Between 1800 and 1945, stallions of various breeds were released there to improve the stock, but there have been no introductions since then. They are now fully protected by law and cannot be molested. The horses are small - they are not ponies - surviving almost exclusively on marram grass. They are self-colored with minimal white-spotting, and there is a range of coat colors. Since Sable Island is not accessible to the public, a small herd has been established at Shubenacadie Wildlife Park in Nova Scotia (Armstrong, 1981).

d) Canadian - Horses from France were sent to Quebec during the 1600s to assist in colonization of that province. The Canadian breed evolved from that origin as a multi-purpose animal for riding, for roadster use, and for light farm work. Mature animals weigh 500 to 700 kilograms. Black is the preferred color but other self-colors occur also. It never became a major breed although it played a part in development of other breeds such as the Morgan and the Standardbred. A breed society was formed in 1885 and a studbook was opened in 1886. The Canadian government assisted in breed development until 1940, when the Quebec government assumed that responsibility. It maintained a large stud at Deschambault until 1981 when the entire herd of 44 horses was sold to
members of the breed society. To encourage continuity of the breed, the provincial government now provides a generous assistance program to owners of breeding stock. The total population currently contains about 120 mature females (Roney, 1982; Sorel, 1982). According to annual reports from Canadian National Livestock Records, about 50 animals are currently being registered each year.

e) Newfoundland pony - Horses have been kept by subsistence farmers and fishermen in Newfoundland, under minimal care and without conscious selection, for several hundred years. Their origin is not recorded. They have evolved into a distinctive docile small horse. Because of changing social system and life styles, the number of horses in Newfoundland is rapidly declining. To encourage preservation of these hardy little animals, attempts are being made to have them recognized as a breed. About 20 were accepted into a stud book in the first year of the pony society's operation (Fraser, 1981).

2. Donkeys (Equus asinus) -

Donkeys have never been a major livestock species in North America, although at one time they had considerable use in mule production. There is a registry society currently operating in the United States to encourage maintenance of pure stocks (Burrill, 1982). According to McKnight's (1964) survey, there are many feral populations of donkeys in western United States; at least some of them are considered to be a nuisance because of competition with native wildlife species, particularly the desert bighorn sheep (Ovis canadensis nelsoni). Feral stocks on public lands in the United States are protected by law (Ryden, 1970) as are all feral donkeys in California (McKnight, 1964). There are a few Poitou donkeys at the Catskill Game Farm in New York, representing an important reserve of a breed which is now very rare in its native France.

3. Cattle (Bos taurus) -

Cattle are perhaps the most important agricultural livestock species in North America and they have held that importance throughout the history of settlement. Several stocks are of interest in relation to germplasm preservation.

a) Texas Longhorn - Cattle introduced by the Spanish were the foundation for the ranching industry until replaced by British breeds. They became very rare, surviving only in two national parks and in a few private herds. However, they have made a remarkable recovery in the last few years, and there has been rapid increase in numbers. They are becoming popular both as purebreds and as sires for crossbreeding in commercial beef herds. Over 45,000 animals are now registered as purebreds by the breed association (Buchen, 1982).

b) Dutch Belted - The Dutch Belted breed is related to the Lakenvelder cattle of Holland, and is based on importations made in the 1800s. The animals are black, with a white belt between shoulders and hips encircling the body. They have never achieved commercial prominence, although their appearance continues to attract interest. The breed association has members throughout
the United States. Eight bulls and 51 females were registered in 1981. In addition, 188 females were registered through a grading-up scheme involving the mating of a Dutch Belted bull with Holstein-Friesian cows and subsequent back-crossing to Dutch Belted males (Heflin, 1982).

c) Canadian - The Canadian breed of cattle evolved from the cattle of Normandy and Brittany which had been sent to Quebec in the sixteenth and seventeenth centuries. Channel Islands and Irish cattle may also have contributed. They are a small dairy breed, black or brown in color. A herd book was established in 1886 and a breed society in 1895. The breed has remained localized in the province of Quebec. Total population comprises about 12,000 females. According to annual reports from Canadian National Livestock Records about 800 animals are being registered each year. Production is about 3,600 kg of milk at 4.5% fat in a year. The provincial government research station at Deschambault has experimented with crossing to Brown Swiss to avoid difficulties from inbreeding and to increase body size and milk production. The crosses may now be entering the breed population (Roney, 1982).

d) Milking Devon and lineback types - The American Minor Breeds Conservancy identified several kinds of cattle in the New England area that might be worth conserving. These included the Milking Devon, and cattle with lineback markings of the Witwick and Holderness types. Attempts were made to establish registries for these animals, but it is not likely that they were successful since the Conservancy seems to have ceased operating. Spohnenberg (1981) estimated that there may be about 500 animals of the Witwick type, and 50 of the Holderness type in existence; there are less than 50 of the Milking Devon but he believes that there is a supply of semen in frozen storage.

e) "Exotic" breeds of beef cattle - During the past two decades, there has been great interest in obtaining germplasm from European breeds for eventual use in commercial crossbreeding. Large numbers of animals from a variety of breeds were imported through Canadian quarantine facilities. They were from both major and minor breeds and included Charolais, Simmental, Maine-Anjou, Salers, Tarentaise, Welsh Black, Romagnola, Chianina, Meuse-Rhine-Yssel, Gelbvieh, Pinzgauer, and many others. Not all of them have achieved commercial popularity. Since some of the imported breeds are rare in their homelands, the North American populations may eventually serve as a germplasm resource for the parent populations.

4. Sheep (Ovis aries) -

There are a great many breeds in North America. Many of them are from Britain and others are of American origin. Some breeds are rare in their native countries, and American flocks may be regarded as an important reserve. Examples are Soays in zoos (Roots, 1982), and local populations of Teeswater and Wiltshire Horn (Spohnenberg, 1981). Others such as Shropshire, Southdown, and Oxford Down, now rare in Britain, are relatively common in North America.

The greatest conservation interest at present concerns Navajo sheep. This stock is descended from Churro sheep introduced by the Spanish in the sixteenth century. It persisted in south-western United States, particularly
on Indian reservations where the fleeces have been used in traditional weaving. A hobbyist group is encouraging interest in preservation of this breed, and a small conservation flock has been established at Utah State University. The animals are multi-colored with a coarse fleece; some of them are four-horned. It is estimated that about 500 sheep of the original Navajo type persist (Painter, 1982). However, other authorities believe that the pure breed is now extinct, although there are still many animals with Navajo ancestry (Burrill, 1982).

5. Goats (Capra hircus) -

Goats have never had commercial importance in North America, although there is increasing interest in them now as dairy animals based on traditional European breeds. In range areas, some are kept for brush control, serving secondarily as a meat source. Chevon is popular in Mexican cookery. Some range flocks are predominantly Angora, yielding mohair for fibre manufacture. Interest has been expressed in identifying goats similar to those introduced by the Spanish and establishing them as a breed, but thus far activity has been limited.

According to McKnight (1964), there are many small populations of feral goats across the United States. Most of them are derived from dairy stock, but some are Angora, and those on coastal islands of California are predominantly Spanish. On Santa Catalina Island the latter are a recognized game animal. Two populations are known in Canada, both in areas of mild climate; there is a group on the Hen Islands of Lake Erie (McKnight, 1964), and another on Saturna Island off the coast of British Columbia (Shackleton, 1981).

6. Pigs (Sus scrofa) -

There has been little interest shown in identifying or conserving rare germplasm of pigs. But with increasing use of crossbreds and hybrids in commercial production, a need for conservation might soon arise. At least one recognized breed, the Mulefoot, has gone to extinction (Sponenberg, 1981). Others such as the Tamworth and the Berkshire are still prevalent in North America but rare in Britain.

Feral swine are by far the most numerous feral ungulates in North America; it is estimated that there are hundreds of thousands of them spread across southern United States, most of them concentrated in the southeastern states (McKnight, 1964). Some of the populations date to 1560 and Spanish introduction, but most are recent. European wild pigs were liberated in some areas as a game animal and they have hybridized with the feral stock. They might represent a useful genetic resource for swine breeders in the future.

7. Dogs (Canis familiaris) -

Introduction of motorized vehicles to the Arctic has reduced the dependancy on sled dogs, and their numbers have dwindled drastically although they still have a minor role to play in transportation, hunting, and protection
of humans from predators. The Canadian Eskimo Dog became extinct as a registered breed. It had been associated with the Thule culture of the Inuit for an estimated 1100 to 2000 years. The Eskimo Dog Research Foundation sought and obtained a few representative animals in remote camps of Boothia Peninsula, Melville Peninsula, and Baffin Island to form a new breeding nucleus. The dogs were assembled at Yellowknife for selection and multiplication. Their population now comprises about 100 animals of the original type, many of them being the third generation bred by the Foundation. They are being reproduced by random breeding, culling only aberrant families. Surplus dogs are being returned to Arctic camps and settlements, and the breed has been re-established with the Canadian Kennel Club (Carpenter, 1981).

8. Poultry species -

Compared with the situation for domestic animals, there is considerable interest and activity in conservation of poultry germplasm resources. Perhaps the need is greater in poultry because of the very narrow genetic base currently being utilized by commercial breeders. A survey of poultry stocks in Canada (Crawford, 1980) indicated that erosion of genetic resources has been extreme.

The Society for Preservation of Poultry Antiquities, and the entire hobbyist movement, are very active in maintaining fancy breeds and varieties (Rice, 1980). There are two major inventories of stocks in print. Somes (1981) has issued his excellent American catalogue in fourth edition, incorporating information from a number of countries besides the United States. A Canadian inventory is revised annually, listing all avian stocks held at public institutions (Flowers et al., 1982). There are two important public collections of rare stocks; one which stresses middle-level poultry is at University of Saskatchewan, and the other is at Nova Scotia Agricultural College. As indicated by Somes' (1981) catalogue, many research workers also maintain resource flocks.

Most of the conservation work thus far has been restricted to chickens. The need for germplasm collection and preservation is probably even greater for turkeys. Resources are still relatively plentiful for non-industrialized species such as geese, ducks, muscovy ducks, and guinea fowl, but they should not be overlooked.

SUMMARY

Except with poultry, there is relatively little interest in North America in purposeful conservation of rare and endangered animal genetic resources. Some stocks receive a measure of protection from governments and public agencies, rare breeds societies, individual breed societies, parks and zoos, and by maintaining a feral existence. Status of known rare animal populations is reviewed briefly. Poultry stocks have been catalogued and rare breeds are being conserved by several organizations. It is suggested that a complete inventory of all rare and endangered animal stocks should be compiled so that the effectiveness of conservation activities can be increased.
RESUMÉ

Avec l'exception des oiseaux avicoles, l'intérêt de conservation des ressources génétiques animales en Amérique du Nord est restreint. Quelques populations reçoivent une certaine protection de différents gouvernements et agences publiques, sociétés de races rares, sociétés de races individuelles, parcs et zoos, et aussi en maintenant une existence sauvage. La condition des populations d'animaux rares est revue brièvement. Les oiseaux avicoles ont été catalogués et les races rares sont présentement conservées par diverses organisations. Il est suggéré qu'un inventaire complet de toutes les populations d'animaux rares et en danger d'extinction soit compilé afin que l'efficacité des activités de conservation puisse augmenter.

References:


In addition to the references listed above, the following research workers and breed society representatives provided information by correspondence: Buchen, J.P., 1982; Burrill, M., 1982; Carpenter, W., 1981; Fraser, A.F., 1981; Heflin, J., 1982; Painter, I., 1982; Rice, J.K., 1980; Roney, D.D., 1982; Roots, C.G., 1982; Shackleton, D., 1981; Sorel, R., 1982; Sponenberg, P., 1981.