Committee on the Status of Endangered Wildlife in Canada

Comité sur le statut des espèces menacées de disparition au Canada

Ottawa, Ont. K1A 0H3
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# STATUS REPORT ON THE LABRADOR DUCK

## *CAMPTORYNCHUS LABRADORIUS*

## IN CANADA

BY

DAVID A. KIRK

**STATUS ASSIGNED IN 1985**
**EXTINCT***

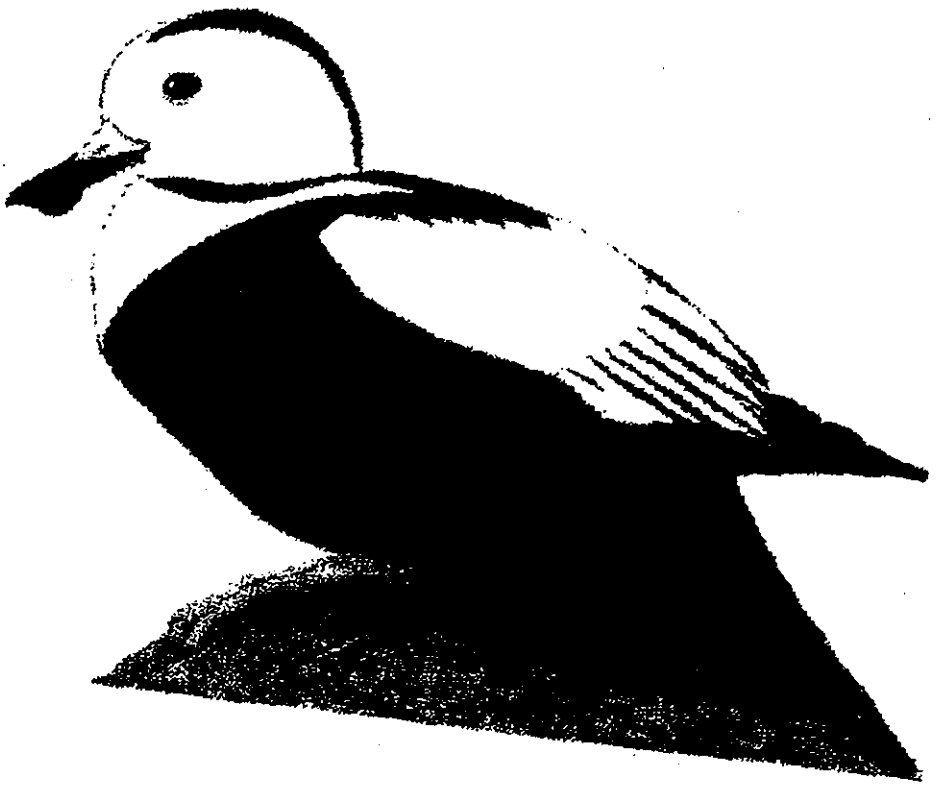
**REASON:** THE LABRADOR DUCK BECAME EXTINCT IN ABOUT 1875 WHEN THE LAST KNOWN BIRD WAS SHOT ON LONG ISLAND, NEW YORK. THE REASONS FOR ITS EXTINCTION ARE UNKNOWN BUT MAY INCLUDE SEVERE REDUCTION OF ITS INVERTEBRATE PREY, HUNTING AND EGG-COLLECTING AND THEIR CUMULATIVE EFFECT. ITS SMALL POPULATION SIZE AND LIMITED DISTRIBUTION MADE IT EXTREMELY VULNERABLE TO THESE AND OTHER FACTORS.

**OCCURRENCE:** N/A

*THIS SPECIES WAS DESIGNATED EXTINCT BY COSEWIC IN 1985 BASED ON HISTORICAL FACT. DUE TO THE LARGE NUMBER OF REQUESTS FOR INFORMATION ON THIS EXTINCT BIRD THE COSEWIC BIRD'S SUBCOMMITTEE [illegible] THIS REPORT PREPARED AND APPROVED BY COSEWIC MEMBERS IN 1994.

# STATUS REPORT ON ENDANGERED WILDIFE IN CANADA

## Labrador Duck
## Canard du Labrador



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COSEWIC

COMMITTEE ON THE STATUS OF ENDANGERED WILDLIFE IN CANADA

# STATUS REPORT ON THE LABRADOR DUCK

# *CAMPTORYNCHUS LABRADORIUS*

# IN CANADA

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Committee on the Status of Endangered Wildlife in Canada

Comité sur le statut des espèces menacées de disparition au Canada

JUNE 1990

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# STATUS REPORT ON THE LABRADOR DUCK *CAMPTORYNCHUS LABRADORIUS* IN CANADA

Pied Duck, Pie Duck, Pied Bird, Fool Bird

(vernacular names in Newfoundland)

BY

DAVID A. KIRK

'I have in my life shot a number of these beautiful birds, though I have never met with more than two or three at a time and mostly single birds'[1]

'The Labrador Duck....was a small, evidently relict population of limited distribution that just disappeared as one casuality in the universal process of evolution. The peculiar construction of its bill may have contributed to its downfall'[2]

[1] A note from Col. Nicholas Pike to ornithologist William Dutcher (1891).

[2] Dr Oliver L. Austin, Jr. (1903).

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## Executive Summary

Description. The Labrador Duck *Camptorhynchus labradorius* was a small sea duck (males 864 g, females 482 g), similar in size to the Steller's Eider *Polysticta stelleri* and about 51-56 cm in length. In adult males, the head, neck, upper belly and scapulars were white. On the cheeks there was an area of yellow, stiff feathers (as in some eider species). At the base of the neck there was a velvety black collar and a black stripe extended from the crown to the nape. The underparts, primary feathers, tail, upper tail coverts and back were also black. The most striking feature of the Labrador Duck was its bill which was similar to that of a Northern Shoveler *Anas clypeata*, being almost as long as the bird's head, and broader towards the tip due to soft-edged lateral flanges. There were also numerous large lammellae (serrations on the underside of the mandibles). Most of the bill was black or brown, and pale grey-blue at the base above the nostrils; a yellow or orange band divided the grey from the black part of the bill. Eyes were yellow or reddish hazel and legs pale ash-coloured on the fore parts and the same colour on the hind part except dotted with black; the web was also black. Female Labrador Ducks were mostly brownish grey, with a bluish slate mantle and sandy coloured rump and tail coverts. The secondaries and greater secondary coverts formed a white speculum. The remaining wing coverts were blue-slate and the tail dark brown. Juveniles were thought to be similar to females, although perhaps darker.

Distribution. The Labrador Duck was restricted to eastern Canada and the United States, and no evidence was found of their breeding elsewhere. Detailed breeding distribution data are lacking but records from hunters and early naturalist collectors indicate that the species probably bred in Labrador and possibly parts of the Québec northshore (island in the Gulf of St. Lawrence). Winter distribution

was better known and birds were recorded from the Ungava Peninsula to the Delaware River and perhaps Chesapeake Bay. In Canada, birds wintered in the Bay of Fundy and around Grand Manan Island in New Brunswick. In the United States, many, possibly most, wintered off Long Island speculating from the number of specimens taken there; wintering Labrador Ducks were also seen on the coasts of New Jersey and New England.

Population size and trends. Judging by accounts from hunters who shot Labrador Ducks for collectors, the species was never common. It was found in markets in the eastern United States, and numbers apparently increased during the period 1840-1860. However, Dutcher (1891) attributes this increase to increased demands for specimens from more scientific collectors, resulting in larger numbers of ducks being shot for markets, rather than any population changes. In the early 1850s, it was common in the markets, but by 1870 none could be found by specimen collectors.

Habitat. Accounts suggested that the Labrador Duck preferred shallow waters for foraging, particularly those over sandy substrate. Thus, it had an inshore distribution and used sheltered bays and harbours, as well as estuaries and even brackish ponds. Nests may have been located on rocky islets, but none were ever certainly found.

General biology. Nothing is known about the clutch size, incubation period or other breeding information for the Labrador Duck. Like other sea ducks it likely had a low reproductive potential, with small clutch size and delayed breeding (males did not develop adult plumage until two years old and probably birds did not breed until 2-3 years old). It was also probably long-lived.

Limiting factors. Labrador Ducks may have had unusual feeding habits which restricted their feeding niche and resulted in a limited distribution. As a result of their reproductive potential (above), they were likely vulnerable to increased adult mortality, such as that caused by hunting.

Protection. Labrador Ducks were never common; a few hunters commented on their extreme rarity. They became extinct prior to the development of conservation programs for waterfowl in the early 1900s.

Special significance of species. The Labrador Duck is an example of how sea ducks restricted to a geographically small area are extremely vulnerable to even low levels of hunting and egg-collecting. Special conservation programs may have to be developed for such species (e.g. Harlequin Duck *Histrionicus histrionicus*), including complete protection.

Conclusions. The Labrador Duck became extinct in about 1875, when the last known bird was shot on Long Island, New York. The reasons for its extinction are unknown but may include severe reduction of its invertebrate prey, hunting, and egg-collecting and their cumulative effect. Its small population size and limited distribution made it extremely vulnerable to these and other factors.

## A. Abstract.

In 1875, fewer than 100 years after being described by Gmelin, the last known Labrador Duck *Camptorhynchus labradorius*, a sea duck (Tribe Mergini), related to the eiders *Somateria* spp. and *Polysticta stelleri* and scoters *Melanitta* spp., was killed on Long Island, New York. The species declined rapidly between 1850-1870. In 1871, the last known specimen in Canada was collected at Grand Manan in New Brunswick. It was thus the first endemic North American bird and the only waterfowl species worldwide to become extinct in recorded history. The Labrador Duck was also the only waterfowl species restricted to the eastern North American coast of the Atlantic. It is not known why the Labrador Duck became extinct. One suggestion is that epizootics (epidemics among invertebrate prey populations) in the eelgrass *Zosterops* spp. habitat where Labrador Ducks may have foraged could have wiped out populations of their invertebrate prey. It is also likely that the extremely limited breeding range of the species, small population size and specialized feeding niche were contributing, possibly cumulative factors. These characteristics made the Labrador Duck extremely vulnerable to human predation; nesting sites were probably raided for their eggs and down, while adults and young were shot. The disturbance of previously remote nest sites in the 19th century, as well as possible introductions of mammalian nest-predators by humans were also likely involved in the species' extinction. Extremely little is known of the biology and ecology of the Labrador Duck. Although it was believed to have nested in Labrador there are no authenticated records for this region, and it has been speculated that the breeding grounds changed even further north. Outside the breeding season, Labrador Ducks were found along the Atlantic coast in the Bay of Fundy, on Long Island and on the New Jersey coast; specimens were found in markets in New York, New Jersey and Baltimore. The unique bill morphology of this species suggests that it had a

highly specialized diet. Large numbers of lamellae on the mandibles and a wide bill tip with lateral flanges may have functioned to filter sand while feeding and for prey detection, respectively. It has been speculated that Labrador Ducks fed on mollusks, small clams, small shellfish and seaweed in the shallow waters over sand or mud bars, or among eelgrass (*Zosterops* spp.) beds.

## B. Distribution

According to Palmer (1976), Labrador Ducks occurred from the Ungava peninsula to the Delaware River and perhaps to Chesapeake Bay (Figure 1). They were restricted to Canada and the eastern United States and no evidence was found of their breeding elsewhere (see Dutcher 1894).

1. In Canada.

Although the former breeding range of the Labrador Duck is not precisely known it is thought to have bred in southern or eastern Labrador, and probably further north (Bent 1925). Part of a collection made by Sir Joseph Banks included male and female Labrador Ducks (Lysaght 1959). George Cartwright may have sent these to Banks from Labrador. This provides some of the strongest evidence that the species bred there (see Todd 1963). The species is also thought to have bred in parts of visited Québec that were previously called Labrador. However, surprisingly Audubon did not see the Labrador Duck when he visited the Labrador Peninsula. According to some sources (e.g., King 1866 in Todd 1963, Phillips 1926) Labrador Ducks also bred on islands in the Gulf of St. Lawrence. Birds killed off Grand Manan Island in New Brunswick may have been wintering individuals. Labrador Ducks also wintered in the Bay of Fundy (Godfrey 1986).

2. United States:

Apparently the wintering grounds of the Labrador Duck were off Long Island (where most specimens were collected; Bent 1925) and on the coast of New Jersey (Giraud 1844). Birds were also seen off the coast of New England in winter (Townsend 1905). Labrador Ducks were recorded south to Chesapeake Bay (Godfrey 1986), where Audubon (1838) claimed to have seen them at the mouth of the James River.

## C. Protection

Labrador Ducks were so rare that their declining numbers were scarcely noticed except by some hunters who shot the birds. Legislation was either too late or inadequate to protect the Labrador Duck. The species went extinct prior to the development of conservation programs by hunters in the early 1900s (see Sanderson in Bellrose 1976).

## D. Population size and trends

Virtually nothing is known about the population of the Labrador Duck, except that the species was never known to be common. The only evidence about the former abundance of the species is largely anecdotal and comés from letters by hunters to naturalist collectors (notably George N. Lawrence, D.G. Elliot, John G. Bell and George A. Boardman *in litt.* to Dutcher 1891). Lawrence (1891, *in litt.* to Dutcher 1891) recorded that Labrador Ducks were not uncommon in markets in about 1851:

> "I recollect that about forty or more years ago it was not unusual to see them in Fulton Market, and without doubt killed on Long Island; at one time I remember seeing six fine males.....

Capt. Nicholas Pike (1891, *in litt.* to Dutcher 1891) wrote:

"I have in my life shot a number of these beautiful birds, though I have never met with more than two or three at a time and mostly single birds. The whole number I ever shot would not exceed a dozen, for they were never plentiful. I rarely met with them. The males in full plumage were exceedingly rare; I think I never met with more than three or four of these; the rest were young males and females....."

Further evidence of a decline was indicated by George A. Boardman:

"I began to collect birds about fifty years ago and wanted to get a pair of each species; I did not care for any more. The Labrador Duck I procured without much trouble, and if I had any duplicates sent to me I did not save them any more than I would have saved duplicates of Scoters, or Old Squaws.....I had shooters all about the coast of Grand Manan and Bay of Fundy sending me anything new or odd.....About twenty years since Messrs. John G. Bell and D.G. Elliot of New York wrote to me to try and get them some Labrador Ducks. I wrote to all my collectors, but all the ducks had gone. It seems very strange that such a bird should become extinct, as it was a good flier." (*in litt.* to Dutcher 1891).

Even in the 17th century the Labrador Duck was not common and between 1850 and 1870 it disappeared from the markets and hunters could no longer find the bird (Greenway 1967). Had it been easy to shoot or good to eat, then its extinction by hunting alone would seem more plausible. However, according to hunters it was extremely wary and took to flight very quickly. Pike wrote:

"They were shy and hard to approach, taking flight from the water at the least alarm, flying very rapidly."

Other accounts, describing the species' tameness, seem contradictory. The challenge of hunting a wary species, and the beautiful plumage of the male meant that the species was probably highly sought after by collectors when it became rare. Its occurrence in markets in the eastern United States (among them New York, New Jersey, Baltimore and others) might seem surprising, given its 'strong unsavoury flesh'. Indeed many carcasses rotted before buyers purchased them (Lawrence in litt. to Dutcher 1891). However, people in remote Canadian communities traditionally dependent on

seabirds and sea ducks likely found Labrador Ducks palatable (R.I. Goudie pers. comm.).

It is notable that males in breeding plumage were always rare in these markets (e.g., Elliot 1898 records large numbers of females and sub-adult males in New York markets between 1860-1870). This may have been because males suffered increased mortality from hunters because of their plumage (they were collected as trophies and probably sent directly to specimen dealers), and thus there was a preponderance of juveniles and females in the population. Alternatively, it was because adults and particularly males, wintered further north (Alexander 1983). Another possibility is that the predominance of juveniles at east coast markets and in sightings by hunters (see Stearns 1883, Elliot 1898), which might be considered indicative of a healthy population, might have actually been evidence of declining numbers (see Goudie 1990), and indicated that fewer birds were reaching maturity.

There are four speculative explanations proposed for the extinction of the Labrador duck: 1) epizootics (epidemic diseases that killed invertebrate prey populations) which may have periodically destroyed eelgrass habitat and thus caused crashes in the Labrador Duck population (Goudie, in prep.), 2) offshore pollution due to increased human populations resulting in declines of their preferred shellfish food (Outram Bangs in Phillips 1926), 3) egg-collecting and taking of down as well as persecution of adults and young for feathers (millinery trade) resulting in disturbance to colonies, and finally 4) hunting of adults during spring and winter. What seems the most likely cause of extinction of the Labrador Duck is deterioration in habitat quality (factors 1 or 2) combined with egg-collecting, general disturbance to breeding areas (3) and hunting of adults (4). Thus, due to a variety of factors, both foraging and breeding habitat quality declined for Labrador Ducks.

Goudie (in review) has speculated that Labrador Ducks fed among the eelgrass *Zostera* spp.

beds in sheltered inlets and estuaries (see below - Habitat). This habitat is susceptible to periodic epizootic crashes which can have a drastic effect both on populations of some bird species and their migration routes (e.g., Brant Goose *Branta bernicula* - Kelley 1986, Erskine 1988). Similar crashes in the very small Labrador Duck population could be catastrophic (Goudie, in prep.), especially if coupled with human predation.

Outram Bangs (in Philips 1926) believed that increased human populations along the coast during the latter part of the 19th century led to pollution (e.g., perhaps sewage effluent) causing decimation of the molluscan fauna prey of the Labrador Duck:

> **".....a far more reasonable view....is to suppose that the Labrador Duck had very specialized food habits and that changes in the molluscan fauna, brought about by increased population along our coast may have proved disastrous. Such changes in minute shellfish are known to have taken place".**

During the nineteenth century, increased travel rendered many northern regions accessible to human depredations (e.g., Newton 1896, Bent 1925, Mowat 1984, for seabirds, Evans and Nettleship 1985). Until then, human populations were low and exploitation was probably confined to small areas. Sanderson (in Bellrose 1976) states that the down of the Labrador Duck was commercially valuable, and it may therefore have been exploited in the same way as the Common Eider *Somateria mollissima*. Despite the lack of interest in procuring Labrador Ducks for food from markets in the eastern United States, it is probable that they were hunted for food by residents of Newfoundland and Labrador, communities that traditionally depend on seabirds and sea ducks, as well as other waterfowl (Montevecchi and Tuck 1987: 219, Goudie 1990; see also Norton 1896, Forbush 1912, Phillips 1926). Both Common Eiders and Oldsquaws are heavily hunted in Newfoundland today, as are scoters on a smaller scale (Wendt and Hyslop 1980, Métras 1986). Montevecchi and Tuck (1987)

estimated that 100,000 sea ducks were shot each year in Newfoundland, more than double the estimated total for freshwater waterfowl. Moreover, in the Newfoundland murre (mostly *Uria lomvia*) hunt about 500,000 murres are killed each winter (Wendt and Cooch 1984, A.J. Gaston in pers. comm. to Montevecchi and Tuck 1987). Many other seabirds are also taken illegally (e.g., Dovekies *Alle alle*, Atlantic Puffins *Fratercula arctica*, shearwaters and Black-legged Kittiwakes *Rissa tridactyla*). Hunting and egg-collecting resulted in drastic declines of the Common Eider population in the early 19th century (Migratory Birds Convention 1916). However, eiders were able to recuperate their numbers by immigration from other subpopulations, whereas there was only one population of the Labrador Duck.

The last authenticated Labrador Duck was killed on Long Island, New York, in the autumn of 1875. Prior to this a bird was taken near Grand Manan Island in 1871. A later record at Elmira, New York in 1878 has not been verified because of loss of the specimen (Greenway 1967). Only 54 specimens of the Labrador Duck remain in museums and collections, and of these 29 are in North America (Hahn 1963). Table 1 provides the sources (where known) of these birds and their locations (from Dutcher 1891,1894).

## E. Habitat

Because of its unusual bill the Labrador Duck was believed to be specialized in its habitat use (Goudie 1990, in prep.), and this is thought to have been a possible factor leading to its extinction. What little is known of the habitat of the species indicates that sheltered bays and harbours were particularly favoured (Dutcher 1891, Forbush 1912, Greenway 1967), as well as estuaries (Audubon 1843, Gregg 1879, Phillips 1926) and even brackish ponds (W.J. Hoxie in Bent 1925). In this respect its habitat

use seems similar to the Steller's Eider, which uses inshore waters during feather molt (Petersen 1981). Conversely, Bent (1925) suggested that the species was seldom found at inland rivers and bays and was predominantly marine.

Accounts suggested that the Labrador Duck foraged in sandy shoals (hence the name 'sand-shoal duck'; Bent 1925, Phillips 1926, Cottam 1939). Audubon (1840) states:

> "It procures its food by diving amidst the rolling surf over sand or mud bars...

Similarly, Pike (in Dutcher 1891) refers to sand bars being preferred habitat:

> "Their familiar haunts were the sandbars where the water was shoal enough for them to pursue their favourite food, small shellfish."

Some direct evidence was provided by Pike in a letter to Dutcher (1891):

> "The specimen of the Labrador Duck presented by me to the Long Island Historical Society, was one of two specimens, both male birds, that I killed in November 1844, at the mouth of the Ipswich River, south end of Plum Island, Massachusetts Bay. I was paddling in my float or sneak boat, covered with salt hay, when I saw three of these birds, two males and a female, feeding on a shoal spot near a sand spit. I shot the males, but the female escaped then....."

Sandy marine habitats are extensive in the area of the Labrador-Ungava peninsula (Goudie, in review). Interestingly, scoters *Melanitta* spp. also prefer to forage over sandy substrates (Stott and Olson 1973, Hirsch 1980, Vermeer and Bourne 1982). Goudie (in review) has also suggested that, given the inshore habitats apparently preferred by the Labrador Duck, it may have foraged in extensive eelgrass *Zostera marina* beds as do many other waterfowl species (e.g., Brant Goose *Branta bernicula* - Erskine 1988).

Its breeding habitat may have been rocky islands, similar to those occupied by Common Eider (Newton 1896). Prof. Newton wrote:

> "This bird, the *Anas labradorius* of the older ornithologists, was nearly allied to the eider duck, and like that species used to breed on rocky islets, where it was safe from the depredations of foxes and other carnivorous quadrupeds."

King (1866) thought the Labrador Duck common in the St. Lawrence and believed that it bred a short distance inland.

## F. General Biology

1) Reproductive

Audubon (1840) reported several deserted nests on the top of low fir bushes at Blanc Sablon in Québec, discovered by his son John Woodhouse, which were reputedly those of the Labrador Duck:

> "Although no birds of this species occurred to me when I was in Labrador, my son, John Woodhouse, and the young friends who accompanied him on the 28th July, 1833, to Blanc Sablon, found, placed on the top of the low tangled fir bushes, several deserted nests, which from the report of the English clerk of the fishing establishment there, we learned to belong to the pied duck. They had much the appearance of those of the eider duck, being very large, formed externally of fir twigs, internally of dried grass, and lined with down. It would thus seem that the pied duck breeds earlier than most of its tribe."

Although Audubon refers to the nests as those of the Pied Duck, which was the common name for Labrador Ducks, this name was also used for several other species as well. Interestingly, the Surf Scoter *Melanitta perspicillata*, which was called the Pied Duck in Newfoundland by 1890 (Thomas Egan, in Dutcher 1891), and possibly before, nests on clumps of small spruce and dwarf willow; the nest is lined with feathers and down (Ehrlich et al. 1988). Thus, Audubon may well have been mistaken about the identity of these nests. Newton (1896) described the nests of Labrador Ducks being located on rocky islets, as were those of the Common Eider, where they were relatively safe from predators. Nothing is known of the clutch size, incubation period or other breeding information

for the Labrador Duck and the only eggs are in the Staatliche Museen fur Tierkunde und Volkerkunde, Dresden, Germany. Judging from other seaducks, the Labrador Duck presumably had one brood. Eggs believed to belong to this species measured 61 mm (2.4 in.) (Ehrlich at al. 1988).

2) Movement

Labrador Ducks moved south from their breeding areas in the winter due to encroachment of pack ice. Coues (1861 in Greenway 1967) mentioned that the species moved through Labrador on migration, having bred farther north:

> "I was informed that though it was rarely seen in summer, it was not an uncommon bird in Labrador during the fall".

3) Behaviour/Adaptability

Audubon (1840) recorded that the Labrador Duck was generally seen in small flocks of 7-10 which he interpreted as family flocks. It is not known whether larger aggregations occurred, but this may have been likely prior to the decline in numbers.

A striking feature of this species is its remarkable bill, which O. Bangs (in Phillips 1926) believed was indicative of unusual feeding habits. The morphology of the bill has been described by Wilson and Bonaparte (1832), and Humphrey and Butsch (1958), and consists of numerous lamellae and a swollen cere. Recently, Goudie (in review) compared bill morphology (size and numbers of lamellae) among the sea ducks. Using Principal Component Analysis (a technique that allowed aspects of bill structure to be examined in relation to body size) he demonstrated a trend from species with relatively small bills (Harlequin Duck, Oldsquaw *Clangula hyemalis* and Steller's Eider) to those with intermediate (King *Somateria spectabilis* and Spectacled Eider *S. fischeri* and Labrador Duck)

and large bills (Common Eider, Black Scoter *Melanitta nigra*, Surf Scoter and White-winged Scoter *M. fusca*). The analysis also revealed that, relative to its body size, the Labrador Duck had the largest lamellae and was most similar to Surf and White-winged Scoter in this respect (Goudie, in prep.) and not the eiders. It has been speculated that these lamellae were used to filter excess sand from prey before swallowing (Goudie, in prep.).

Goudie (in review) has noted the similarity of the bill flaps of the Labrador Duck to those of the New Zealand Blue Duck *Hymenolaimus malocrorhynchus* (see Kear and Burton 1971). Kear and Burton (1971) suggested that these bill flaps provide an increased lateral tactile area for prey detection and Goudie (in review) proposes a similar function in the Labrador Duck. Also unknown is the function of the wide bill tip and enlarged flanges in the Labrador Duck, reminiscent of that of the Northern Shoveler *Anas clypeata*. The specialized bill morphology of the Labrador Duck may indicate that its diet differed markedly from that of other sea ducks (see Phillips 1926).

There are few data on the prey taken by Labrador Ducks but reports by naturalists suggested that small shellfish, clams, common mussels and fish fry were taken, as well as different species of seaweed (Audubon 1843, Wilson and Bonaparte 1832). Audubon (1840) based his account partly on a taxidermist who baited lines with mussels to catch Labrador Ducks:

> "A bird stuffer whom I knew at Camden had many fine specimens [of Labrador Ducks], all of which he had procured by baiting fishhooks with the common mussel, on a trot line sunk below the surface, but on which he never found one alive, on account of the manner in which these ducks dive and flounder when securely hooked.....Its usual fare consists of small shellfish, fry and various kinds of seaweeds, along with which it swallows much sand and gravel."

Only one other direct piece of information exists concerning the diet of the Labrador Duck. The stomach contents of a female Labrador Duck shot by S.F. Cheney (in litt. to Dutcher 1891) were

examined in April 1871. In his letter, Cheney wrote:

> "The female Labrador Duck I gave to Mr Herrick was with some oldsquaws or long-tailed ducks when I shot it, and I think there were no others of its kind with it. This one had small shells in its crop. It dove to the bottom with the squaws."

On the wintering grounds in the sandy substrates where it preferred to forage, the Labrador Duck may have taken burrowing species, like clams (e.g., *Mya arenaria*) or Polychaete worms and other mobile species (e.g., Gammarid amphipods; Goudie, in prep.).

## G Limiting factors

It is very probable that the Labrador Duck, like other sea ducks (e.g., Harlequin Duck *Histrionicus histrionicus* - Goudie 1990), had relatively low reproductive potential compared to other hunted Anatidae, including delayed breeding (males did not develop adult plumage until two years - Pike in Dutcher 1891, and probably birds did not breed until two or three years old) and relatively small clutch size (see Palmer 1976). They were also likely long-lived and had a very limited distribution.

## H Special significance of the species

The Labrador Duck had small populations that were restricted to a geographically small area. Both hunting and egg-collecting have caused historical declines in Icelandic populations of Harlequin Ducks, and it is highly probable that these two activities were partly responsible for the extinction of the Labrador Duck. The Labrador Duck provides an example of how extant sea ducks might be extremely vulnerable to human predation, even at a very low level, and that with such small

populations sustainable use is likely impossible. Thus, concern has been recently expressed for the eastern population of the Harlequin Duck (Goudie 1990), as well as the Spectacled Eider, which has declined in western Alaska (Stehn et al . 1993) and the Steller's Eider which has declined in the Yukon-Kuskokwim Delta, Alaska (Kertell 1991).

## I. Evaluation and Proposed Status

The Labrador Duck became extinct in about 1875 when the last known individual was killed on Long Island. The last individual killed in Canada was at Grand Manan, New Brunswick in 1871.

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Table 1 List of specimens with origin of Labrador Ducks (after Dutcher 1891).

| Location | Number | Sex | Source |
|---|---|---|---|
| Europe | | | |
| British Museum | 2 | male, female | male - presented by Hudson's Bay Company; female - purchased from Verreaux 1863 |
| Liverpool Museum | 3 | male, female, juv. male | male - purchased from Mr Gould 1833; female presented by T.C. Eyston, purchased from Mr Gould 1833; young male |
| Strickland Collection, Cambridge | 1 | male | obtained by H.E. Strickland from relation A. Strickland. |
| Col. Wedderburn's collection | 1 | male | Shot by him, 1852, Halifax harbour |
| Leyden Museum | 2 | male, female | Obtained 1863; Name on birds Prince of Neuwied. |
| Berlin Museum | 1 | | |
| Paris Muséum d'Histoire Naturelle | 1 | male | Presented, 1810 by Mr Hyde |
| North America Prof. Baird's list | | | |
| American Museum | 4 | 2 males, 1 juv. male, 1 female | male - from Wied Collection, 'Labrador'<br>male - from Mr Elliot's collection, Long Island, New York<br>juv. male "<br>female " |
| Collection George N. Lawrence | 3 | male, juv. male, female | male - obtained about 1842, Long Island, N.Y.<br>female - "<br>juv. male - obtained 1865 |
| Brooklyn, Long Island | | | |
| Long Island Historical Society | 1 | male | Long Island, N.Y. |
| Collection Dr Aiken | 1 | juv. male | obtained within few years from Long Island, N.Y. |
| Poughkeepsie, N.Y., Vassar College | 2 | male, female | male - from collection of J.P. Giraud, L.I.<br>female - " |

(Continued on next page)

Table 1 - continued

| Location | Number | Sex | Source |
|---|---|---|---|
| Albany, New York; State collection | 1 | male | Long Island, N.Y. (all of above obtained south shore Long Island, c 1840-1842 |
| Collection George A. Boardman | 2 | male, female | |
| Burlington (Vermont University) | 2 | male, female | Long Island |
| Philadelphia, Acad. Nat. Sci. | 2 | male, female | |
| Washington, Smithson. Inst. | 3 | 2 males, 1 female | male - Long Island<br>male and female from Audubon's collection, source unknown |
| Collection A.B. Covert, Ann Arbour, Michigan | 1 | | Taken at Delhi Mill, Michigan, 17 April 1872 |
| American Museum Natural History, N.Y. | 7 | 5 males (2 juv.), 2 females | male - from Wied Collection, Labrador<br>male - from Mr Elliot's Collection, L.I.<br>juv. male - "<br>male - from G.N. Lawrence Collection, L.I., obtained c 1842<br>female - "<br>juv. male - " obtained c 1865 |
| Long Island Historical Society. Brooklyn | 1 | male | one of two killed Nov. 1844, mouth Ipswich River, south Plum Island, Massachusssetts Bay by N. Pike who gave male and female to J. Bell |
| Collection G. Plummer | 1 | juv. male | sold to Plummer by H.F. Aten |
| Vasar College, Poughkeepsie, N.Y. | 1 | male | from collection J.P. Giraud. Probably from Long Island. Listed female not found |
| Univ. of State New York, Albany | 2 | male, female | male - listed in De Rham collection, no data<br>female - |
| Collection C.B. Cory | 2 | male, female | killed between 1857-1860, were in G. Boardman's collection, sold 10 years before to Cory |
| Univ. Vermont, Burlington | 1 | male | from Philip Brasher collection, probably collected on Long Island |

(Continued on next page)

Table 1 - continued

| Location | Number | Sex | Source |
|---|---|---|---|
| Acad. Nat. Sci., Philadelphia | 3 | 2 juv. males, female | juv. male - procured through T.B. Wilson<br>female - Probably from Pennsylvania or New Jersey, procured by Krider or Cassin, as for other specimens (2 juv. males) |
| US National Museum, under direction Smithsonian | 4 | 3 males (1 juv.), 1 female | male - north Atlantic<br>female - "<br>male - "<br>juv. male - Long Island, N.Y., fall 1875 |
| Collection W. Brewster | 2 | female, juv. male | female - Nova Scotia, 1857. Bought from B.A. Hoopes, 1878, who obtained it from W.P. Trumbull, who obtained it from New York taxidermist<br>juv. male - purchased from T.B. Heinstreet, Troy, N.Y., who bought it at sale of sale collection G.B. Warren. |
| Boston Soc. Nat. Hist., Boston | 1 | juv. male | donated by T. Lyman |
| Dalhousie College, Halifax, N.S. | 2 | male, female | originally owned by Rev. Dr. MacCulloch, Pictou, N.S. |

Figure 1 Tentative distribution of Labrador Duck