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Progress Notes contain timely data and conclusions and are presented as a service to other wildlife biologists and agencies.

Recent changes in waterfowl hunting effort and kill in Canada and the USA

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Abstract

Estimates based on responses by hunters to the Canadian and American waterfowl harvest surveys in the four hunting seasons between 1983-84 and 1986-87 show that the number of active waterfowl hunters continued to decline, as did the reported kill of ducks. The kill of geese had been increasing between 1974 and 1982; it is no longer increasing in Canada and has decreased greatly in the USA. Canadian waterfowl hunters continue to be more successful, on average, than US hunters.

Within Canada, waterfowl hunting continues to decrease in all regions, especially in the Prairie Provinces, though the rates of decline have slackened. The percentage of hunters reporting success in taking ducks has increased in the East and fallen in the Prairie Provinces. Success in taking geese has increased everywhere, except in Quebec.

The decreased hunting effort was matched by smaller annual kills of 16 species of ducks; only the kill of Wood Ducks (*Aix sponsa*) increased. Two eastern-breeding species showed increases in the rates of kill: the Black Duck (*Anas rubripes*) and Ring-necked Duck (*Aythya collaris*). The kill rate for Black Ducks was highest in the Maritimes and Quebec, where it increased. It continued to decrease in Ontario and Newfoundland. The kill rate for Mallard (*Anas platyrhynchos*) decreased only in the Prairies and increased in Quebec and the Maritimes (where the Mallard is still scarce). Ducks present during the hunting season in eastern Canada and British Columbia seem to be maintaining their numbers, or increasing. The numbers of most ducks breeding in or passing through the Prairie Provinces are still decreasing.

Introduction

Studies of the relative importance of hunting in Canada and the USA in determining the size of the reported retrieved kill of ducks and geese in North America showed that in the 1970s and early 1980s the numbers of waterfowl hunters were declining, as was the kill of ducks, whereas the kill of geese was increasing (Boyd 1983, 1985). Changes in hunting activity and success need to be taken into account in planning conservation and regulatory strategies. The purpose of this note is to update the earlier studies by summarizing the amount of waterfowl hunting and the reported kill in four additional hunting seasons (1983-84 to 1986-87) to show whether trends evident in the previous decade have continued and whether other changes are becoming apparent.

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The data were collected by means of the National Harvest Survey (NHS) and Species Composition Survey (SCS) in Canada and the analogous surveys in the USA. These are mail surveys, using questionnaires sent to samples of buyers of the Canada Migratory Game Bird Hunting Permit and to buyers of Federal Waterfowl Hunting Stamps (duck stamps) in the USA. The Canadian surveys were described in detail by Cooch *et al.* (1978). They have remained essentially unchanged since 1972.

Results

Hunting activities in Canada and the USA

The number of active waterfowl hunters decreased in 1983-86 in Canada and the USA (Fig. 1), as did the total amount of hunting (estimated in "hunter-days"). There were corresponding declines in the reported kills of ducks and geese, although the kill of geese declined much less in Canada than in the USA.

Figure 2 illustrates the relationship between hunting effort and reported kill in the form of two rates: the kill per 1000 hunter-days, and the mean seasonal kill per active hunter. For geese, both rates increased through the 1980s, more in Canada than in the USA; the increase in Canada was less than that in the late 1970s. For ducks, both rates of harvest declined more steeply in 1983-86 than they had in the previous 4 yr, especially in the USA. In 1982-84, the US seasonal duck kill per active hunter, previously lower than in Canada, closely approximated the Canadian rate; in 1985 and 1986, it decreased again. The US duck kill per 1000 hunter-days continues to be substantially below that in Canada. Thus, the loss of comparative advantage for Canadian hunters in the early 1980s (Boyd 1985) may have disappeared.

Changes in hunting effort and success in Canada

From the Canadian NHS, it is possible to estimate the number of "successful" hunters (i.e., those who reported shooting and retrieving at least one duck or goose in the course of a season) and to distinguish takers of ducks and geese. (The US surveys estimate the percentage of hunters who are successful without distinguishing between takers of ducks and geese.) Figure 3 shows that, in Canada as a whole, successful hunters of ducks alone decreased by 30% between 1979 and 1986, the much smaller number of hunters who took only geese changed little, and those who took both ducks and geese fluctuated around 92500 ± 7200, about 31% of all successful hunters. The data for 1983-86 confirm the continuation of earlier trends. Although the reduction in numbers of successful hunters was far greater in the Prairie Provinces than elsewhere, it is a national, not a regional, phenomenon.

If the reported successes of duck and goose hunters are examined separately, the regional patterns are more varied. In Figure 4, the percentages of active hunters who claimed success are compared for four regions. Data for Ontario

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and British Columbia are not shown, to prevent the graphs from becoming too cluttered. In Ontario, the percentage of hunters claiming to have shot ducks was 79.4 ± 0.5 in 1983-86, compared with 78.2 ± 0.7 in 1979-82. In British Columbia, the corresponding percentages were 78.3 ± 2.0 in 1983-86 and 79.2 ± 2.6 in 1979-82. In both provinces, the percentage of successful goose hunters was higher in 1983-86 (19-26% in Ontario; 26-33% in British Columbia) than in 1979-82.

Among the four regions included in Figure 4, Quebec is unusual in showing wide fluctuations in goose-hunting success and a very recent increase in duck-hunting success. In Newfoundland, where reported success in taking both ducks and geese has been less than in other parts of Canada, some catching up occurred: hunters in Newfoundland increased their success in 1983-86, as did those in the Maritimes. These gains are reflected in the rates of kill per 1000 hunter-days (Fig. 5). The Prairie Provinces again provide the most spectacular changes, with continuing gains in goose-hunting success doing much to offset the losses in duck-hunting success.

The kill of species of ducks

In 1974-82, the reported Canadian kill of six of the eight species of dabbling ducks (*Anas* spp.) that occur widely in Canada showed significant decreases: only the Black Duck and Green-winged Teal (*A. crecca carolinensis*) showed no clear trend. In 1983-86, the mean annual kills of all eight species were lower than they had been in 1974-82 (Table 1). For the Mallard (in the Prairie Provinces) and the Black Duck (in eastern Canada), regulatory attempts were made to reduce the kill during 1983-86 — these were not notably successful (Figs. 6 and 7). In the Prairie Provinces, the mean annual kill of Mallard decreased by 43% between 1974-82 and 1983-86, whereas that of the six other dabblers together fell by 33%. In the East, the introduction of additional restrictions on the taking of Black Ducks had very little net effect on the total kill.

The reported kill of the Wood Duck, nearly all in Ontario and Quebec, increased sharply in 1983 and remained at a level previously approached only in 1978. As in earlier years, the kill of individual species of pochard — Redheads (*Aythya americana*), Canvasbacks (*A. valisineria*), Ring-necked Ducks and Greater and Lesser Scaup (*A. marila* and *A. affinis*) — showed wide year-to-year variations in 1983-86, although the combined kill was relatively constant. The Ring-necked Duck was the only pochard species for which the kill clearly increased in 1983-86. Among the 10 species of sea ducks of which appreciable numbers are shot, there were few departures in 1983-86 from the mean kill in 1974-82. The kill of goldeneyes (*Bucephala clangula*, with *B. islandica* only in Quebec and British Columbia) was relatively constant in 1983-86, although at a level (84000 ± 2500) well below that in 1974-82 (110 000).

When the kills are adjusted for hunting effort by conversion to kill per 1000 hunter-days, the apparent rate of decline decreases (cf. last two columns of Table 1 and

Fig. 6). Of the 17 species for which rates of kill are shown in Table 1, the rate in 1983-86 compared with that in 1974-82 was higher in 4 cases, much the same in 3 and lower in 10. The apparent increases were in the Black Duck, Wood Duck, Ring-necked Duck (three predominantly eastern breeders) and the Greater Scaup (very small increase; breeding largely in Alaska and northwestern Canada, it is found chiefly in Ontario and Quebec in the fall). The species for which the national harvest success rate showed virtually no change between 1974-82 and 1983-86 were the Green-winged Teal, Lesser Scaup and Hooded Merganser (*Lophodytes cucullatus*).

The Green-winged Teal is one of the few ducks hunted in all the provinces. Figure 7 (bottom left) shows that the national picture of its kill (Figure 6, bottom left) is the resultant of several different regional patterns; recent increases, especially in the Atlantic provinces, Quebec and British Columbia, largely offset reductions in 1981-83.

In other parts of Figure 7, rates are illustrated only for those regions in which substantial numbers of a species are shot. In some cases, the changes observed in different regions were similar (e.g., for the Redhead and Canvasback in the prairies and Ontario, and for the Greater Scaup, Ring-necked Duck and goldeneyes in the three eastern regions). In those cases, only a single line has been plotted. For the Lesser Scaup, taken chiefly in Manitoba, Ontario and Quebec, there seem to have been substantial regional differences. The growth of the kill of Wood Ducks has assumed different forms in Ontario (steady in 1979-82, a large increase in 1983) and Quebec (a longer, slower climb), although in both provinces the harvest success rate fell sharply from 1985 to 1986.

The kill of species of geese

One of the most striking features of the kill of different species of geese in North America (Fig. 8) is that year-to-year variations in reported kill have been much less, proportionately as well as absolutely, in Canada than in the USA. However, the appearance of stability in the Canadian kill masks some important regional variations, in the Prairie Provinces (Fig. 9) and elsewhere (Fig. 10).

In all provinces and regions except Quebec (decrease of 17.6%), the mean annual reported kill of Canada Geese (*Branta canadensis*) was higher in 1983-86 than in 1979-82; the percentage increase ranged from 9.9% in the Prairie Provinces to 23.0% in the Maritimes. The kill in 1981 was exceptionally low in Quebec, Ontario and Manitoba, and nowhere was it above the average kill of 1979-82. The kill in 1986 was at the highest level yet recorded in Ontario and the Maritimes and appeared to be recovering in Quebec. In western Canada, the kill peaked in 1983 in Alberta and Saskatchewan and in 1985 in Manitoba and British Columbia, and the kill in 1986 was markedly lower than in 1985. It appears, therefore, that the growth in kill may have ended in the West (Fig. 9) but not the East.

Lesser Snow Geese (*Anser caerulescens caerulescens*) are taken principally in Manitoba and Saskatchewan (Fig. 10,

bottom right), with relatively small numbers farther west and in Ontario and Quebec, where the reported kill, mostly from goose-hunting camps around James Bay, collapsed after 1980. That may be due in part to changes in the management of the hunting camps, which have declined in popularity with US and other visiting hunters; it is also a reflection of large-scale changes in the southward (and spring) migrations of eastern Lesser Snow Geese, which have tended to drift westwards both as breeding birds and as migrants (Kerbes *et al.* 1983).

Greater Snow Geese (*A. c. atlanticus*) are taken almost entirely in south-central Quebec, chiefly along the estuary of the St. Lawrence River immediately downstream of Quebec City. The reported kill (not illustrated) ranged from 55 400 in 1980 to only 9900 in 1986, the kill in 1986 being much less than in any previous year. There have long been large year-to-year fluctuations in the kill associated with high or low proportions of young geese in the fall flight (Reed *et al.* 1981; Gauvin and Reed 1987), but the latest reduction reflects a great change in the mean lengths of stay of staging geese on the St. Lawrence River — increasing numbers fly quickly through to the wintering area on the US Atlantic coast.

The relatively small kill of Ross' Geese (*Anser rossii*) (not illustrated; mean for 1979-86 is 5100 ± 1600) was largely concentrated in Saskatchewan prior to 1984; in 1984-86, the numbers taken in Alberta rose to 67% of the total of only 3375 in Canada in 1986.

The Canadian kill of White-fronted Geese (*Anser albifrons*) was much higher in 1980 (79 000) than thereafter (Fig. 10, top right). The kill is concentrated in Saskatchewan and Alberta. Since 1983, the percentage taken in Alberta has increased from 11% to nearly 35%. A few are taken in British Columbia (maximum 400 in 1985) and Manitoba (2700 in 1980), but hardly any are taken in the East.

The numbers of Brant (*Branta bernicla*) taken in Canada during the fall are so small that most of the estimates yielded by the NHS and SCS are zero on both coasts. In British Columbia, some Brant (*B. b. nigricans*) are taken in a short season in early March, when northward-bound migrants stop in the province; there is no measure of that kill. Large numbers of Atlantic Brant (*B. b. hrota*) pass through James Bay and the Ontario part of the St. Lawrence Valley, and smaller numbers stop in spring in the estuary of the St. Lawrence River as well as in the Maritimes, but these yield no legal kill. Thus, knowledge of the size and status of the two populations outside the breeding season is largely dependent upon surveys in the USA.

The relative proportions of the different species of geese in the Canadian kill did not change significantly between 1979-82 and 1983-84, with Canada Geese making up about $\frac{3}{5}$ and Lesser Snow Geese $\frac{1}{4}$.

Comparing the reported kill of geese in Canada and the USA (Figs. 1, 8), Boyd (1985) reported that the Canadian kill made up about 28% of the North American kill of Canada Geese in 1974-82; corresponding percentages were 63.0% for Greater Snow Geese, 18.0% for Lesser Snow Geese, 41% for Ross' Geese and 33.3% for White-fronted Geese. In 1983-86, the corresponding percentages were 28% for Canada Geese, 57% for Greater Snow Geese, 24% for Lesser Snow Geese, 37% for Ross' Geese and 32% for White-fronted Geese. These are not significant changes, particularly in view of the relatively large annual variations in the kill in the USA.

References

- Boyd, H. 1983. Intensive regulation of duck hunting in North America: its purpose and achievements. *Can. Wildl. Serv. Occas. Pap.* No. 50. 22 pp.
- Boyd, H. 1985. The reported kill of ducks and geese in Canada and the U.S.A., 1974-82. *Can. Wildl. Serv. Occas. Pap.* No. 55. 20 pp.
- Cooch, F.G.; Wendt, S.; Smith, G.E.J.; Butler, G. 1978. The Canada Migratory Game Bird Hunting Permit and associated surveys. Pages 8-41 in Boyd, H.; Finney, G. eds. *Migratory game bird hunters and hunting in Canada*. *Can. Wildl. Serv. Rep. Ser.* No. 43. 127 pp.
- Canadian Wildlife Service and US Fish and Wildlife Service. 1986. North American waterfowl management plan: a strategy for cooperation. ISBN 0-662-14905-X. Ottawa. 19 pp.
- Gauvin, J.; Reed, A. 1987. A simulation model for the Greater Snow Goose population. *Can. Wildl. Serv. Occas. Pap.* No. 64. 20 pp.
- Kerbes, R.H.; McLandress, M.R.; Smith, G.E.J.; Beyersbergen, G.W.; Goodwin, B. 1983. Ross' Geese and Lesser Snow Goose colonies in the central Canadian Arctic. *Can. J. Zool.* 61(11):168-173.
- Reed, A.; Boyd, H.; Wendt, J.S. 1981. Characteristics of the harvest of Greater Snow Geese. *Trans. Northeast Section, Wildl. Soc.* 38:77-86.

Table 1
Estimates of reported kill of principal quarry species of ducks in Canada in 1983-86, compared with kill in 1974-82 (in thousands, to the nearest hundred)

Species/group	Estimated kill				Mean		Mean kill rate*	
	1983	1984	1985	1986	1983-86	1974-82	1983-86	1974-82
Dabbling ducks								
Mallard	759.4	1 059.4	908.4	879.2	901.6	1 583	360	528
Black Duck	304.7	307.8	300.3	293.9	301.7	308	120	103
Gadwall	77.3	56.6	53.7	52.8	60.1	108	24	35
American Wigeon	96.2	78.8	71.7	77.0	80.9	127	32	42
Green-winged Teal	162.6	152.3	192.0	173.5	170.1	206	68	69
Blue-winged Teal	113.9	73.8	58.9	74.8	80.4	122	31	41
Northern Shoveler	46.4	33.0	27.6	38.5	36.4	52	14	17
Northern Pintail	104.2	102.0	92.3	60.5	89.8	163	35	54
Total	1 664.7	1 863.7	1 704.9	1 650.2	1 720.9	2 667	683	889
Wood Duck								
Wood Duck	143.0	144.3	141.6	122.9	138.0	117	55	39
Pochards								
Redhead	58.4	17.9	27.5	42.6	36.6	47	14	16
Canvasback	25.6	20.0	18.4	29.4	23.4	29	7	10
Greater Scaup	56.5	48.9	51.9	53.4	52.7	58	21	19
Lesser Scaup	102.1	108.7	115.0	102.4	107.0	126	43	42
Ring-necked Duck	118.9	146.6	149.6	135.6	112.7	118	55	39
Total pochards	361.5	342.1	362.4	364.4	357.6	378	142	126
Sea ducks								
American Goldeneye	84.3	87.5	85.0	80.6	84.4	110	34	37
Bufflehead	51.6	48.1	44.0	42.3	46.5	63	18	21
Hooded Merganser	28.4	31.3	28.3	27.7	28.9	34	12	11
Total sea ducks	319.3	322.2	285.5	268.5	298.9	357	119	119
All ducks	2 493.4	2 688.0	2 501.8	2 421.5	2 526.2	3 551	1 006	1 187

* Kill rate = kill per 1000 hunter-days

Figure 1
Estimates of waterfowl hunting effort and kill in Canada and the USA, 1979-86 (in millions)

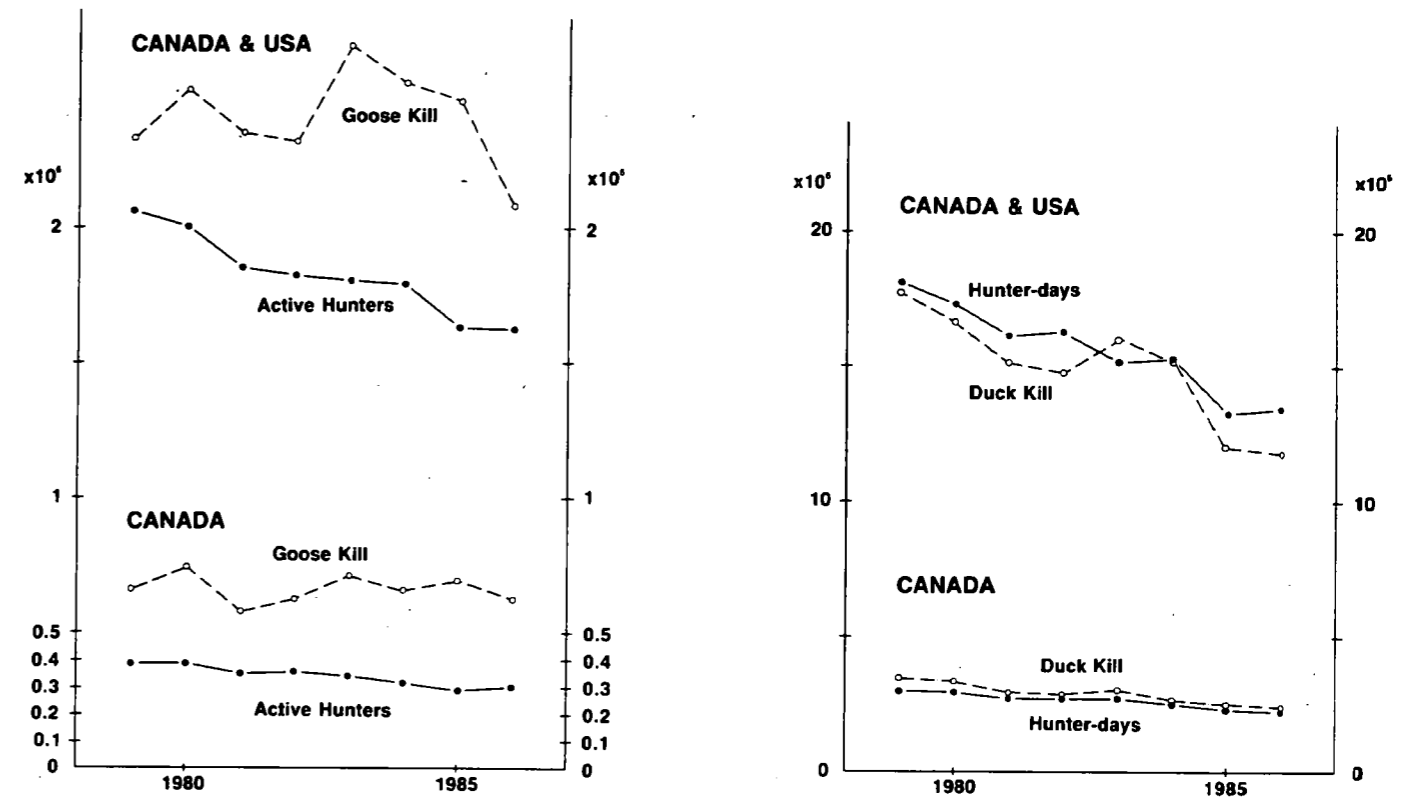


Figure 2
Yield for effort in waterfowl hunting in Canada and the USA, 1979-86: (left) kill per 1000 hunter-days; (right) mean seasonal kill per active hunter

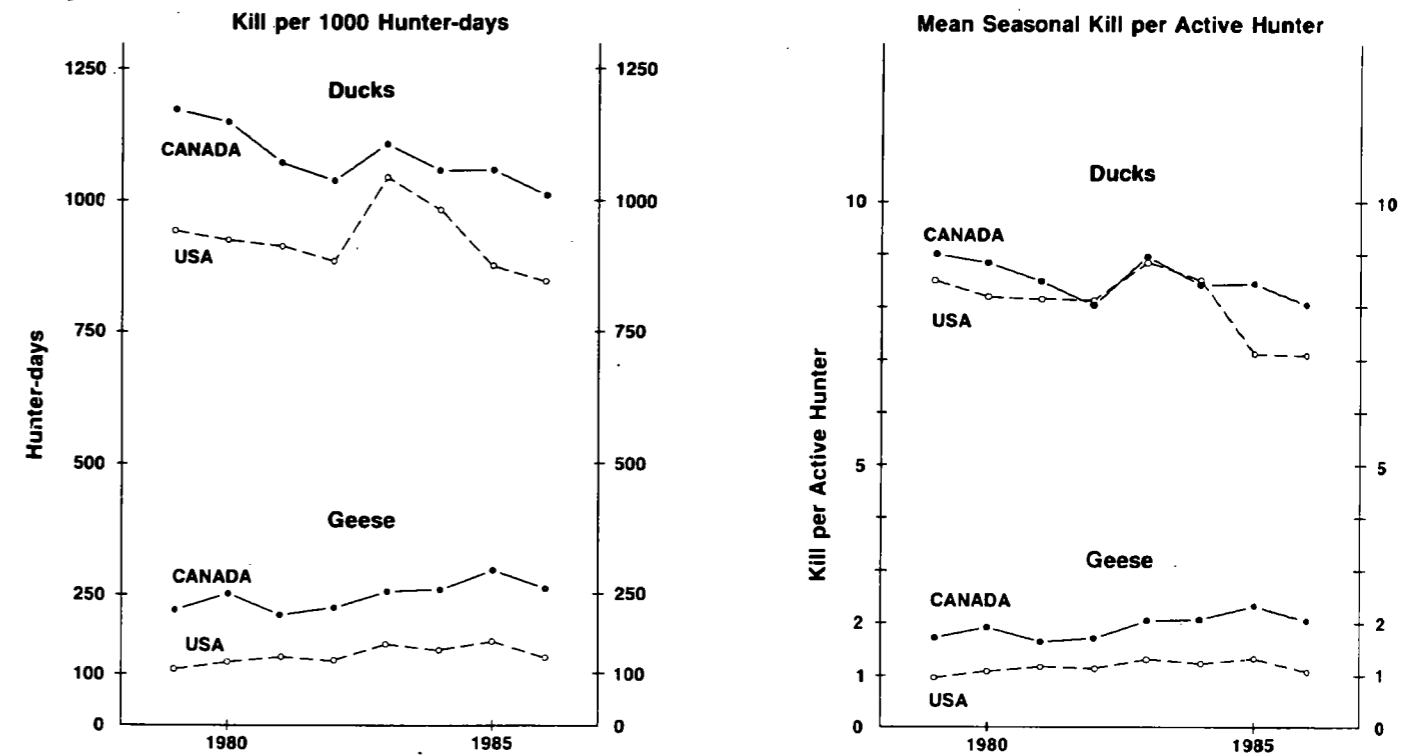


Figure 3
Numbers of successful waterfowl hunters in Canada (left) and the regions (right), 1979-86 (in thousands)

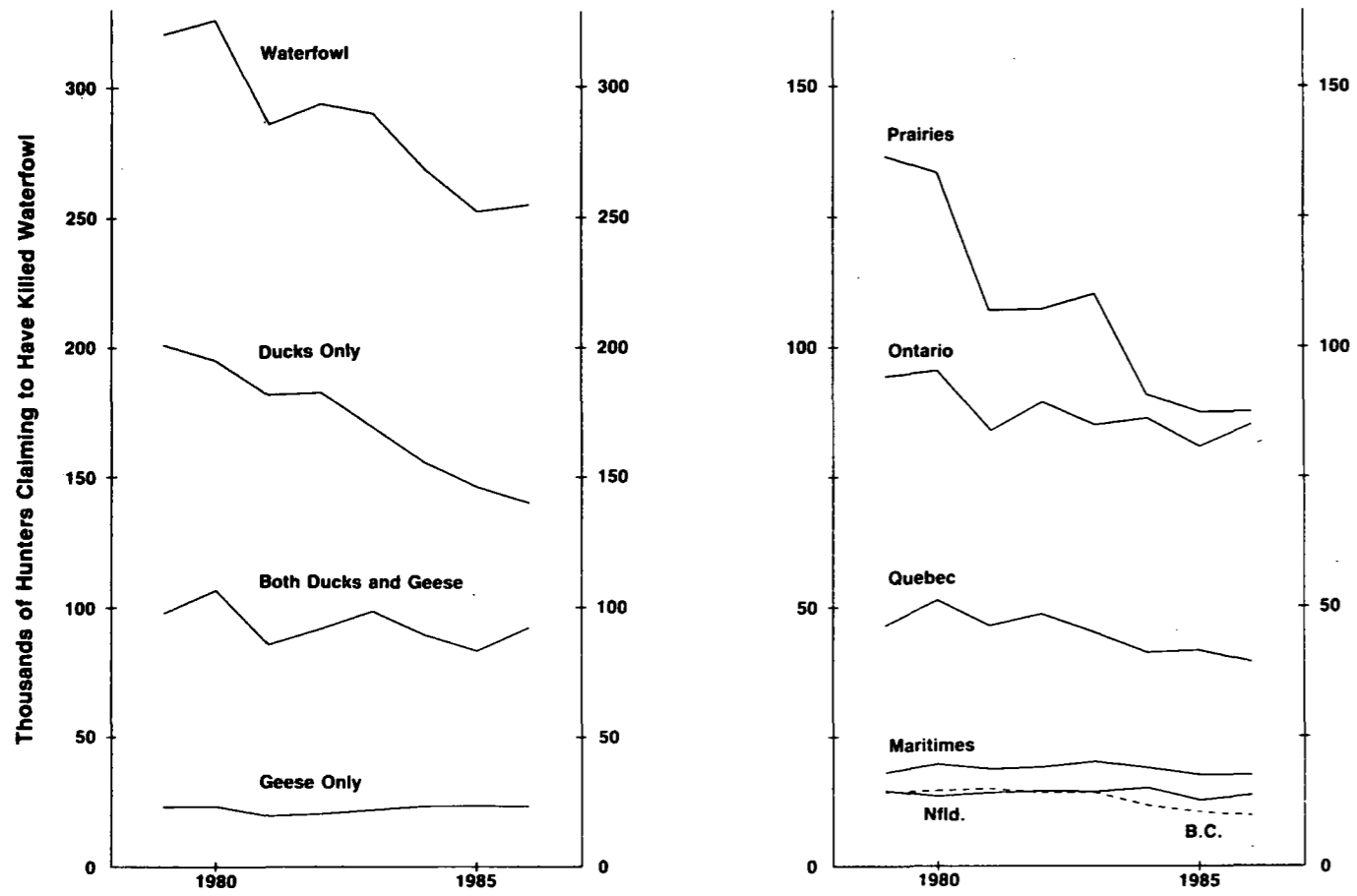


Figure 4
Successful hunters as percentages of active waterfowl hunters in four regions of Canada, 1979-86, for geese (left) and ducks (right)

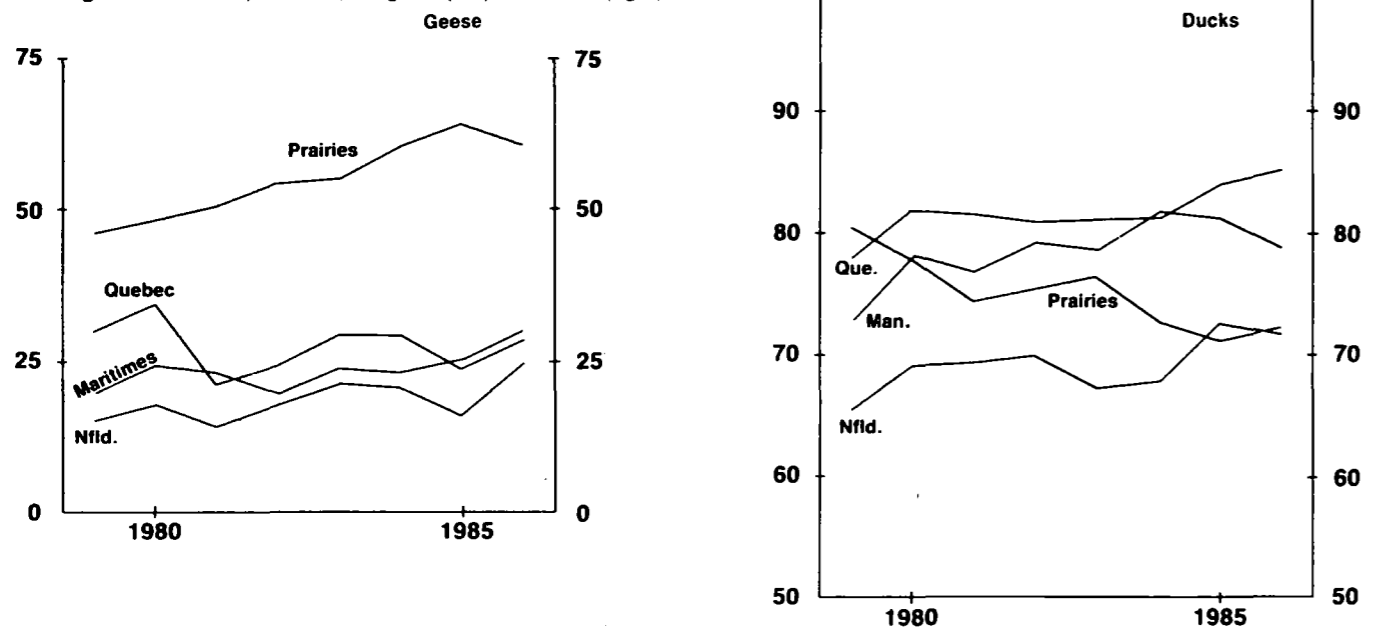


Figure 5
Reported kill of waterfowl in Canada per 1000 hunter-days, 1979-86: (left) ducks; (right) geese

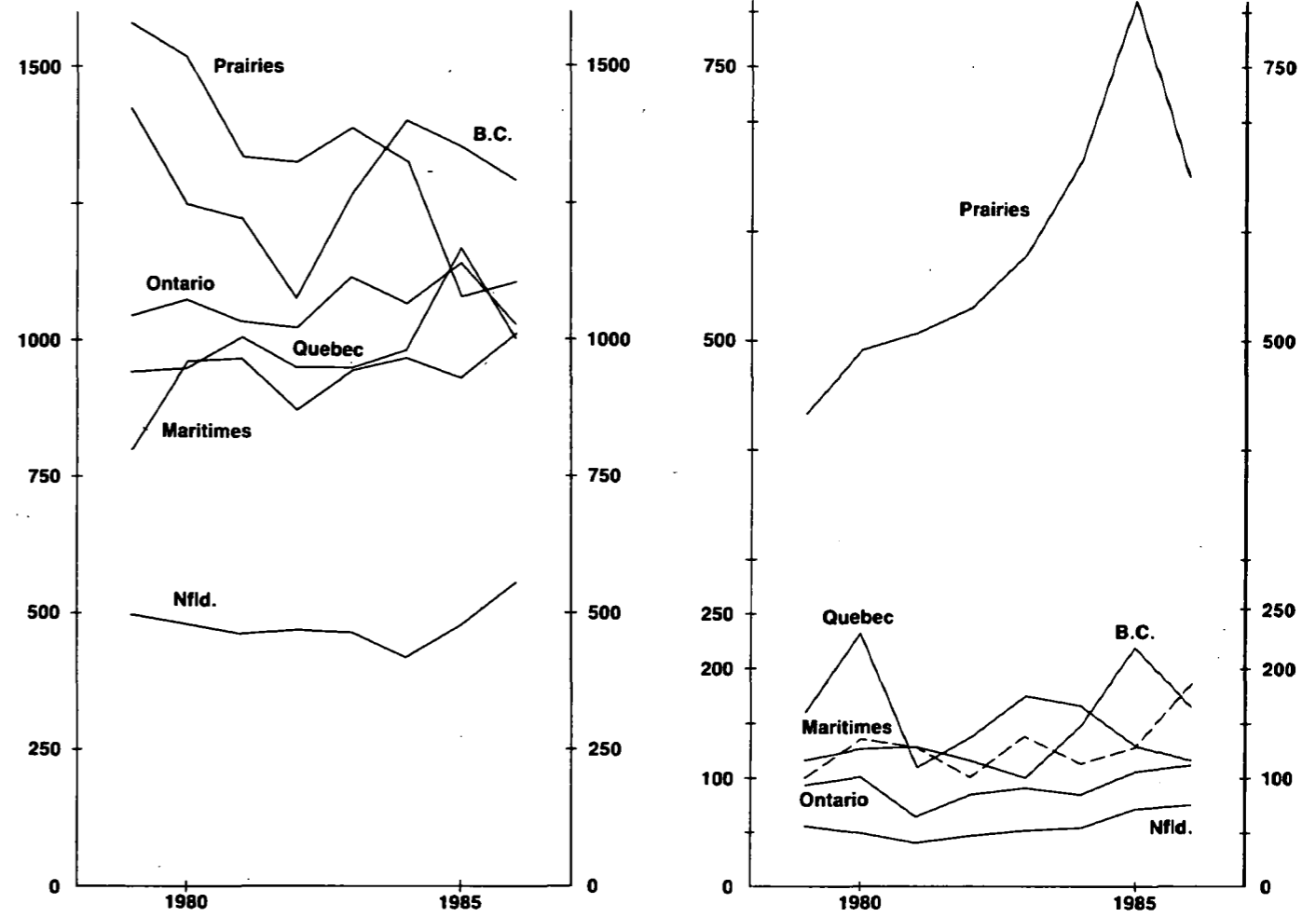


Figure 6
National kill rates (per 1000 hunter-days) for principal game ducks in Canada, 1979-86

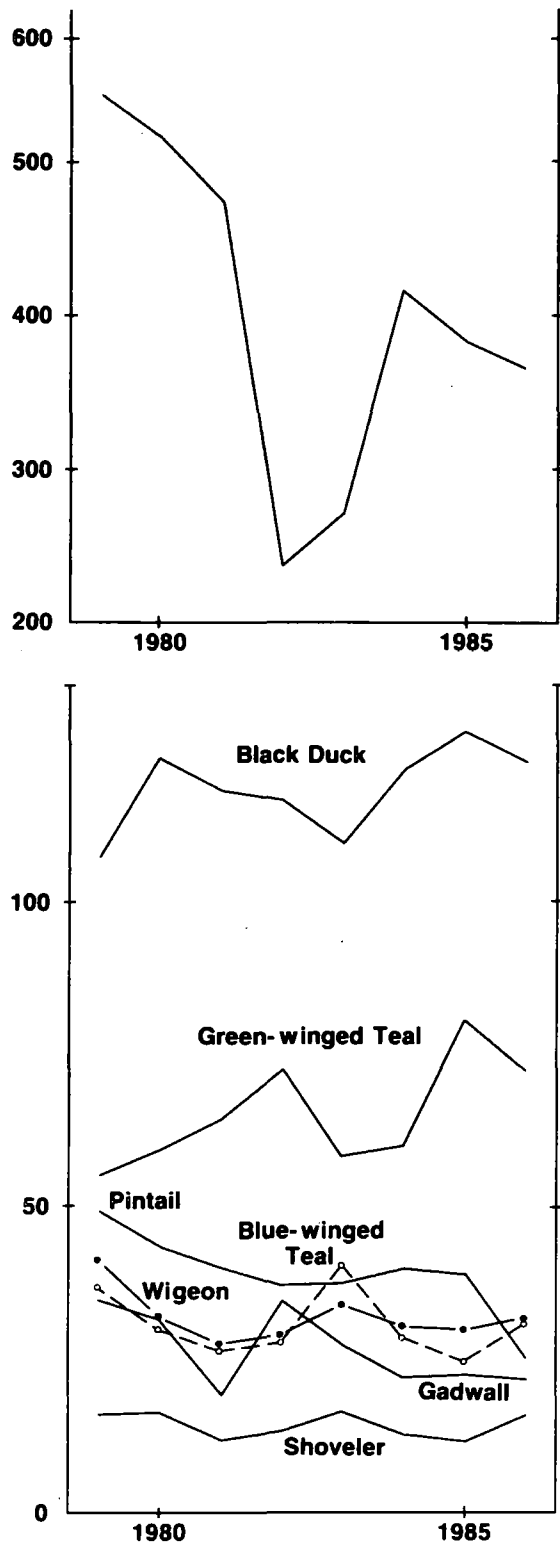


Figure 7
Regional kill rates (per 1000 hunter-days) for principal game ducks in Canada, 1979-86

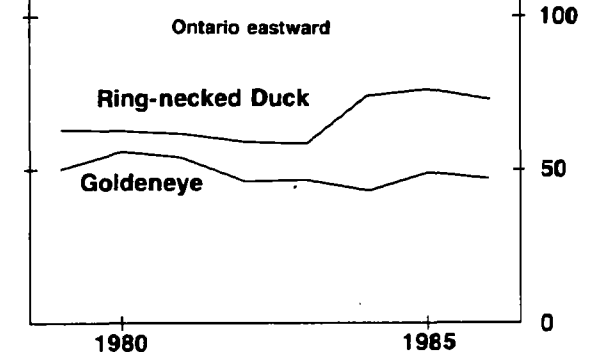
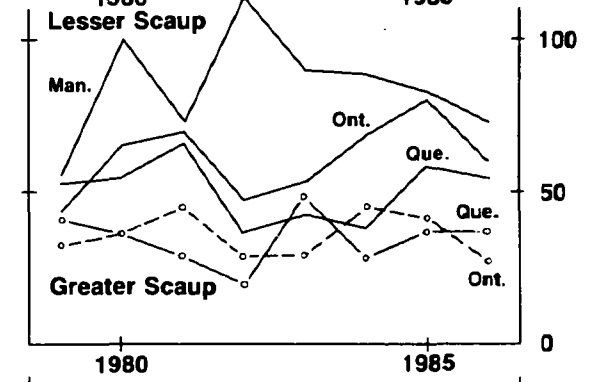
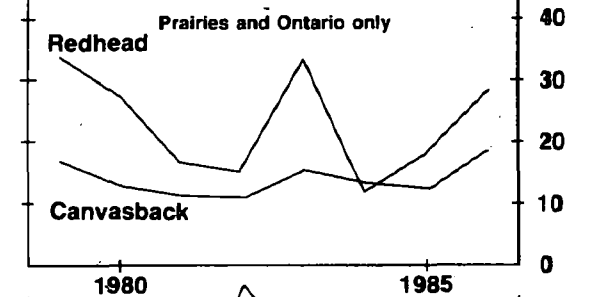
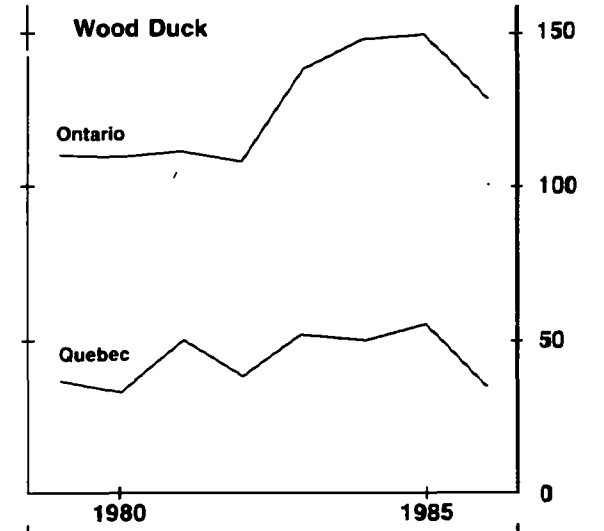
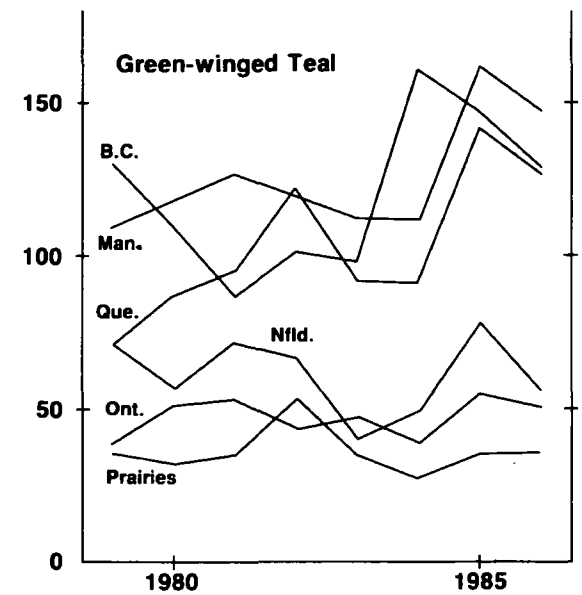
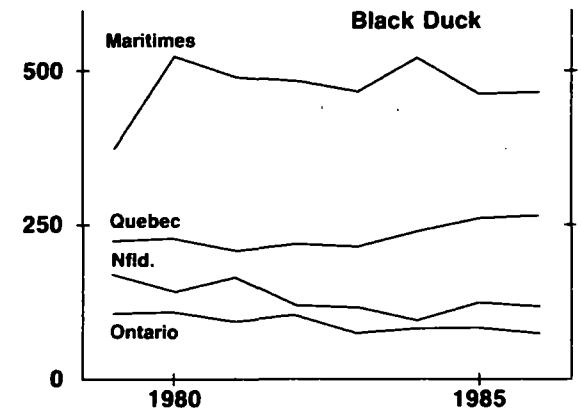
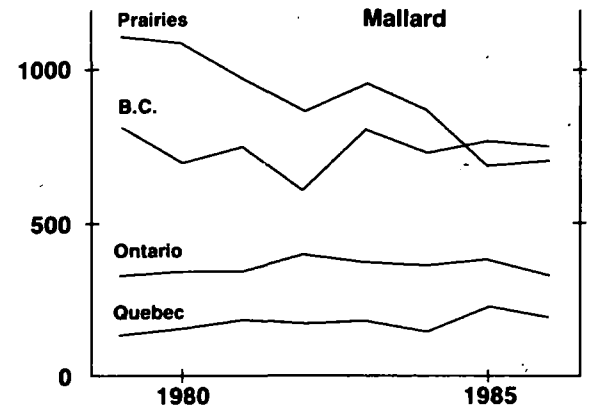
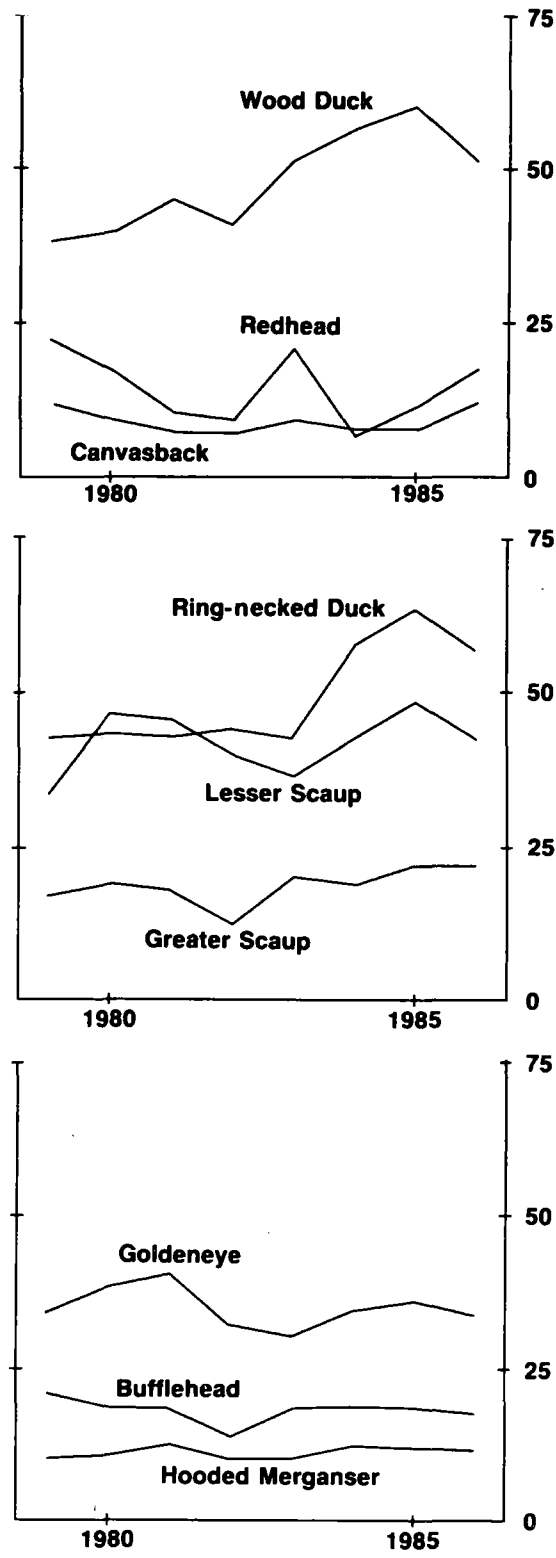


Figure 8
The kill of species of geese in Canada and the USA in 1979-86 (in thousands; note three different scales)

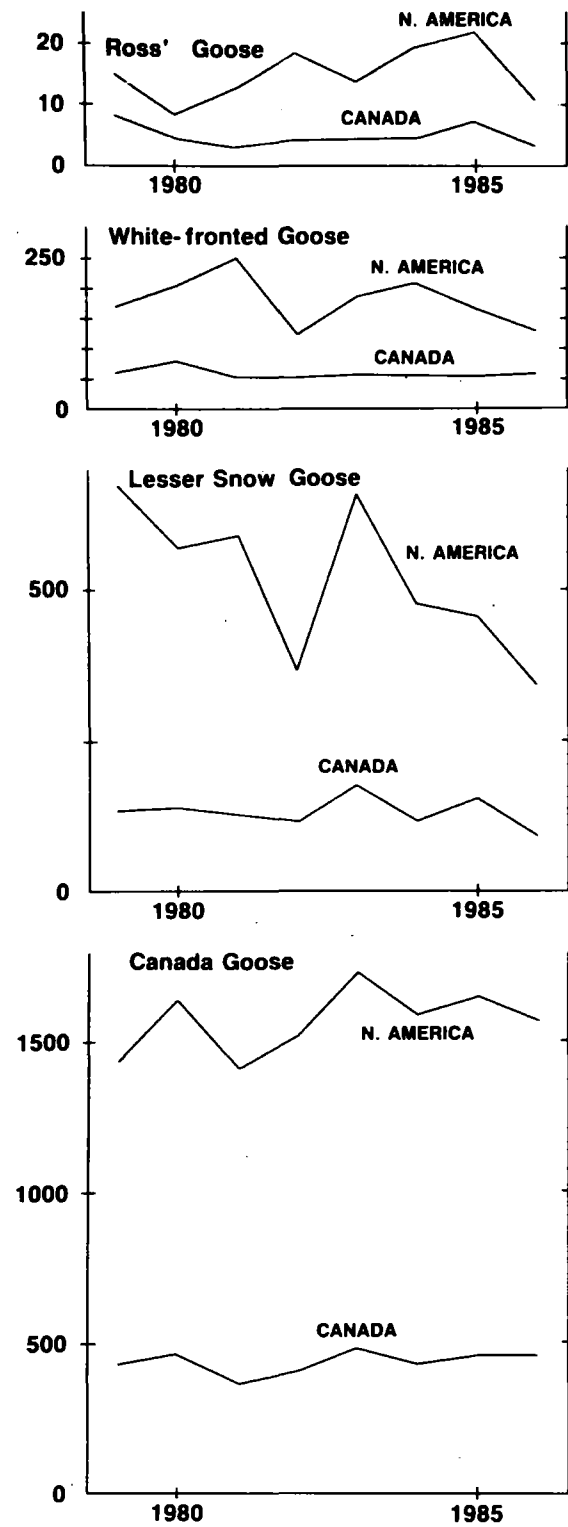


Figure 9
Reported kill of geese in the Prairie Provinces, 1977-86 (in thousands)

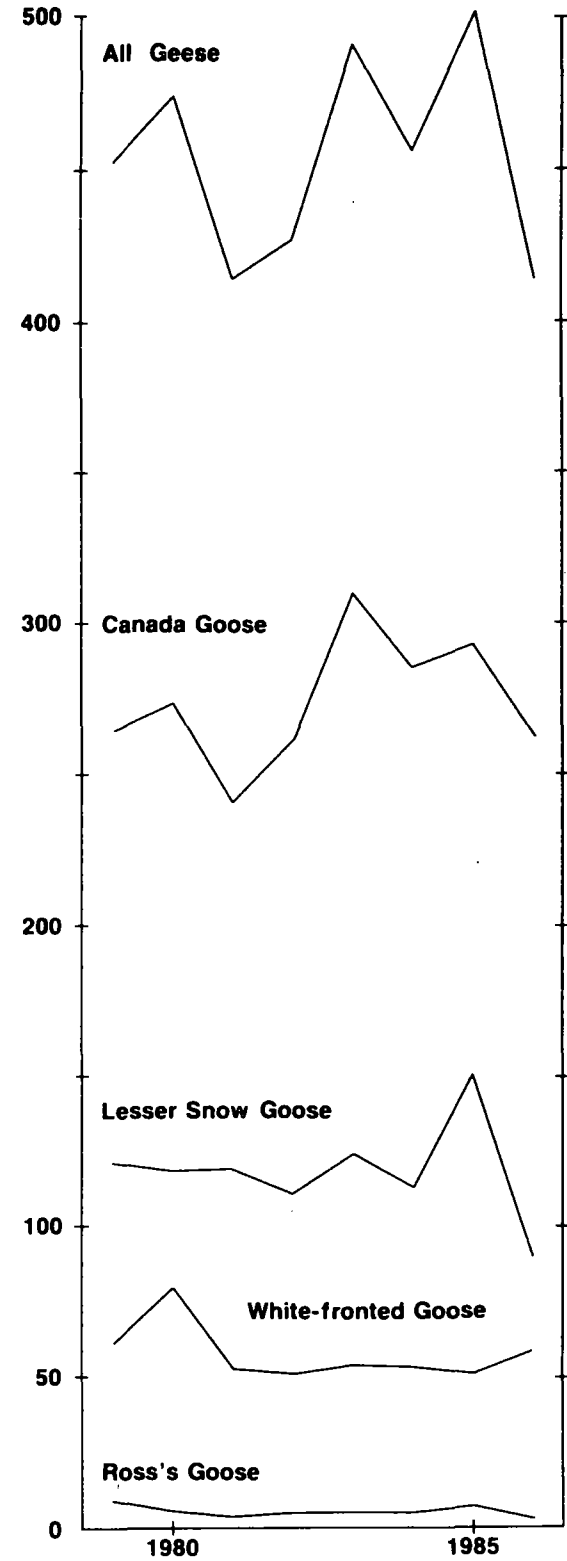


Figure 10
Regional differences in the kill of geese in Canada, 1979-86 (in thousands)

