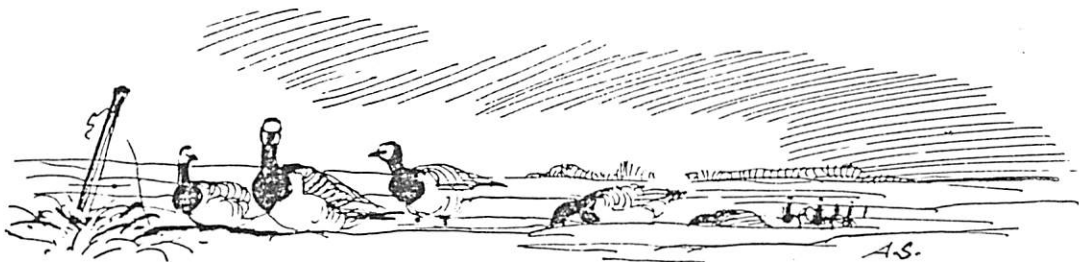




Co-ordinated Goose Counting Routes on the  
Island of Islay, Argyll

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Comments: This report describes in detail the counting routes and methods developed for assessing the populations of barnacle geese and Greenland white-fronted geese wintering on Islay, which supports over 60% of the Greenland population of the former species and over 25% of the total population of the latter one. Because of interactions with farming interests, regular assessments of the populations are required, and this report should enable a standard and researched method to be used for these. The results of the method to date will be reported separately.

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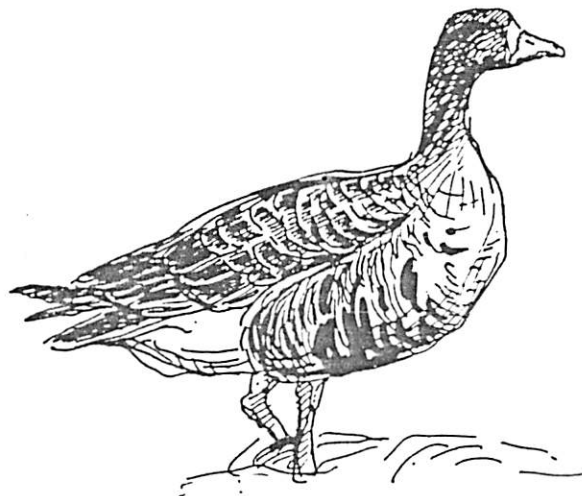
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## 1. INTRODUCTION

The effective conservation of goose populations requires accurate information concerning numbers and distribution. Islay, the most southerly of the Inner Hebrides, is the most important area in Britain for wintering geese. In winter the island holds over 25% of the world population of Greenland White-fronted Geese (Anser albifrons flavirostris) and over 60% of the Greenland race of Barnacle Geese (Branta leucopsis). Conservation of geese on Islay is thus crucial for the continued well being of these populations.

Numbers of geese on Islay have been monitored in a long series of autumn and spring counts by the Wildfowl Trust. However, these two winter counts provided only a very limited assessment of changes in numbers through the winter, and no information on the specific use of farmland on a field by field basis, and were not strictly comparable between years.

With the passing of the Wildlife and Countryside Act 1981, both Greenland White-fronted and Barnacle Geese gained protection from shooting although DAFS licences could be issued to shoot geese to prevent "serious agricultural damage". This protection brought conservation problems on Islay to a head, with numerous claims for shooting licences or compensation following cases of alleged agricultural damage. There was thus an urgent need for much more detailed information on the size and distribution of the Islay goose populations which would enable the Nature Conservancy Council to respond to this changed situation.

The Greenland White-fronted Goose Study (which had been carrying out studies on this race of geese for some years), and the Nature Conservancy Council thus developed a goose monitoring programme for Islay. The aim of this programme was three fold:

1. to assess accurately the size of the Islay goose population each month through the winter;
2. to estimate the accuracy of these counts, and to investigate factors affecting this, by undertaking paired counts on consecutive days each month;

3. to investigate the distribution of geese on the island in greater detail than had previously been attempted, to provide a detailed data-base with which to plan a conservation strategy for these important populations.

When planning the counts, the most important consideration was that all potential goose feeding areas were counted in the course of a single day. Furthermore, these areas should be counted in such a way as to minimise the possibility of under- or over-recording. On this basis observed changes in numbers and distribution of geese could be regarded, with greater confidence, as reflecting 'real' changes in numbers present.

A period of intensive exploratory work was undertaken in spring 1983 aimed at identifying all potential goose feeding areas. The basic route undertaken by the Wildfowl Trust was modified to include additional areas. Island counts were made in February, March and April 1983 during which time the route and method were further developed. From 1983/4 until 1985/6 the route and counting procedure has remained largely unchanged, although some additional areas have recently been included reflecting increased knowledge of the geese or changed patterns of distribution.

This report presents the route used in sufficient detail to allow it to be repeated in the future. The results collected, and their implications for goose conservation on Islay are to be presented elsewhere.

## 2. GOOSE AREAS ON ISLAY

Despite the potential problems of interpretation, a sub-division of Islay into areas was necessary in order to arrange the logistics of counting the whole island in a single day (Figure 1). Whilst it is impossible to draw discrete boundaries around "sub-populations" on the island, boundaries were drawn to minimise the effects of movements between areas, this was possible using data obtained by following individually marked geese (Greenland White-fronted Goose Study unpublished). There may be greater short-term movement between areas for Barnacle Geese than for Greenland White-fronted Geese and this is currently under investigation by Glasgow University.

Maps showing the precise boundaries used in counts are shown after the description of the route in each area.

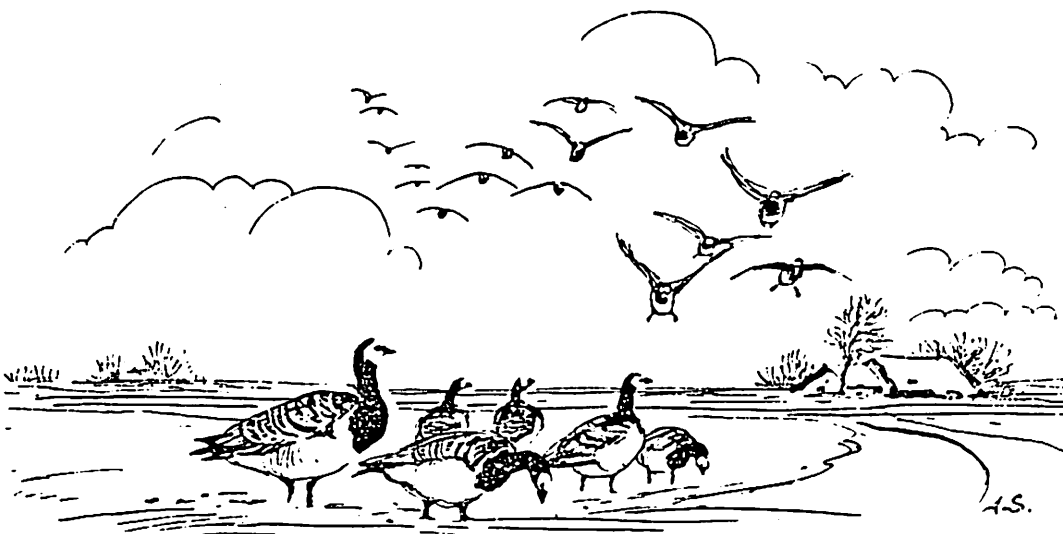
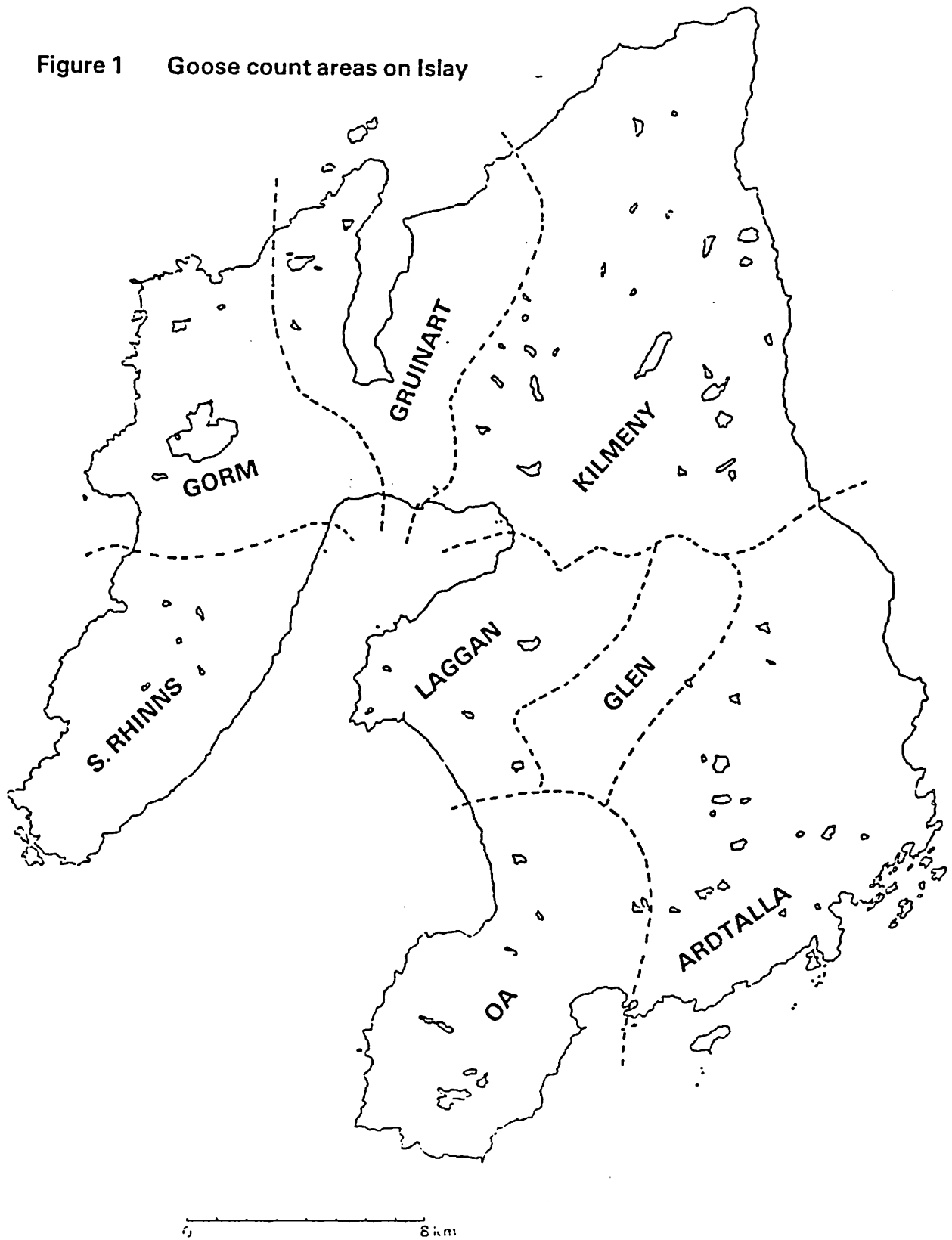


Figure 1 Goose count areas on Islay



### 3. ORGANISATION OF THE COUNTS

The counts were undertaken by eight people counting in four teams using four vehicles. The areas were divided between teams as follows:

- TEAM A Rhinns, Oa and Ardtalla
- TEAM B Laggan, Glen and part of Kilmeny
- TEAM C Gruinart, Gorm
- TEAM D Kilmeny

Before each count all teams met at Carnain (NR 318630). The precise timing of the count varied and depended on the timing of the departure of Barnacle geese from their mud-flat roost at the head of Loch Indaal. This in turn was determined by the lunar cycle. During the period of the full moon and especially when there has been both full moon and clear skies, the geese feed at night. This means that Barnacle geese are slow to leave the roost in the mornings and start of the count can be seriously delayed. In contrast, during new moon periods there is no nocturnal feeding and the geese leave the roost promptly at first light. These are the ideal conditions for an island census since an early start can be made and a full day spent counting, which eliminates the risk of errors due to birds moving from the roost in small numbers over several hours, and maximises available daylight for counting in the "short days" of mid-winter. Wherever possible counts were made in the period of the new moon each month.

Exactly the same route was followed by the same team on each of the two consecutive counts each month. Only exceptionally did team members undertake different routes on the two days.





#### 4. GRUINART AND GORM

Start from Carnain (NR 318630) at the head of Loch Indaal (Figure 2). Drive north along minor road past West Carrabus. Count all geese to the west of this road. First stop at Borichill Mor, leave vehicle and walk to hilltop (Lamh-Bheinn), and then scan rough ground to west and north for Whitefronts. Continue along the minor road past Coullabus counting all geese to the west. At the junction with the Gruinart road turn left towards Lyrabus, counting geese on both sides of this road. Stop below Blackpark and walk uphill to check rough ground and pools for WF. There is considerable 'dead ground' here. Continue on this minor road to the A847, turn left, stop at first gate on left, walk up field and check dead ground for both Whitefronts and Barnacle geese. Count coastal grassland below road as far east as Blackrock. Drive east along A847, turn at Blackrock and drive back to Corsapol road end.

Drive up Corsapol farm track, stop on this track and scan south Gruinart flats, Craigens flats, and Craigens upper. Scan across to Grainel, noting the position of flocks to check again on return journey. Drive on to Corsapol, stop here and walk to the fields behind Craigens and Corsapol. Drive from Corsapol to Craigens on farmtrack, checking fields to the east of Craigens (NR 3067).

Collect the key to the Killinallan gate from farm and then drive to Bun-an-uillt stopping en route to check fields above the road for Barnacle geese (walk) and scanning across Loch Gruinart to Gruinart Farm and Cottage. Check fields before Bun-an-uillt for Barnacle geese. Drive on to Killinallan, stopping to scan across Loch Gruinart towards the sloping fields below Leckgruinart, Garra-eallabus and Kilnave. Drive towards Gortantaoid, back checking all the time for Barnacle geese and Whitefronts. Check for flock movements between Ardnave and Killinallan.

Drive back to Aoradh noting position of any flocks counted on west side of Loch and on south flats. It is especially important to monitor movements of flocks already counted. From Aoradh count west flats and fields below Bushmill all the time checking whether any of the geese noted earlier have moved. Then drive north to Ardnave counting the geese above and below road en route as a check on earlier counts. Park at Ardnave and walk to Ardnave Point, scan and listen for geese on Nave Island, particularly in late spring (March and April). Watch out for flock movements between Ardnave and Killinallan and also from Ardnave down the coast to Sanaigmhor. Drive back to Aoradh and west across the B8017 to Loch Gorm counting any geese seen on the way.

At the road junction turn right and drive to Sanaig (Figure 3). Past Coille, stop and scan fields at Kindrachid for Greenland Whitefronts. Scan the arable fields south and west of Sanaigmhor. From the old cottage before Sanaigmhor carefully check the marshy fields south of farm and also hill slopes east of Loch Ruime where disturbed Whitefronts sometimes shelter. Back to junction with telephone box and check up to the fields below Kindrochid, Leek and Ballinaby from a distance. Fields close to Ballinaby become dead ground further along the road and thorough scans to the west here are advantageous. Then turn right along north side of Loch Gorm, check Loch Gorm for Whitefronts and count Ballinaby fields south of road. Stop at Saligo, walk to Smaull and check both the improved and machair fields. Drive to Kilchoman via Coul Farm, walking out to back of Coul.

Drive up to Kilchoman and stop in front of the cottages and scan back to Rockside fields and Coul in the distance. Drive on the minor road on south side of Loch Gorm to Sunderland checking all fields and Loch Gorm. Drive to junction by Rockmountain and turn left checking ground between Sunderland and Grulinmore. Drive to Rockmountain drive back to A847 via Foreland only counting to east of minor road. About 0.5 km after Rockmountain, stop and check to north scanning across to fields below Grainel, and into bottom of valley where there are pockets of improved grassland occasionally holding small numbers of Whitefronts.

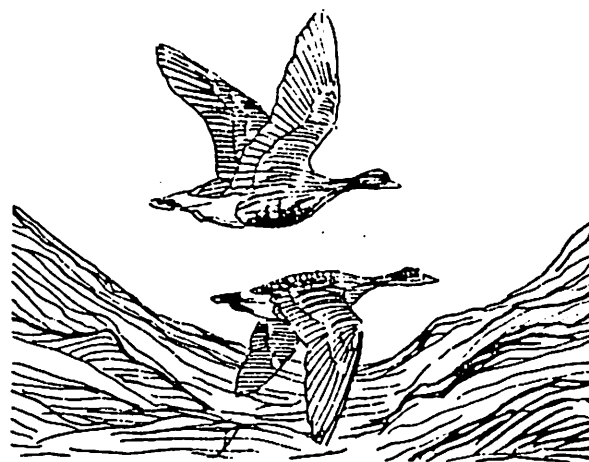
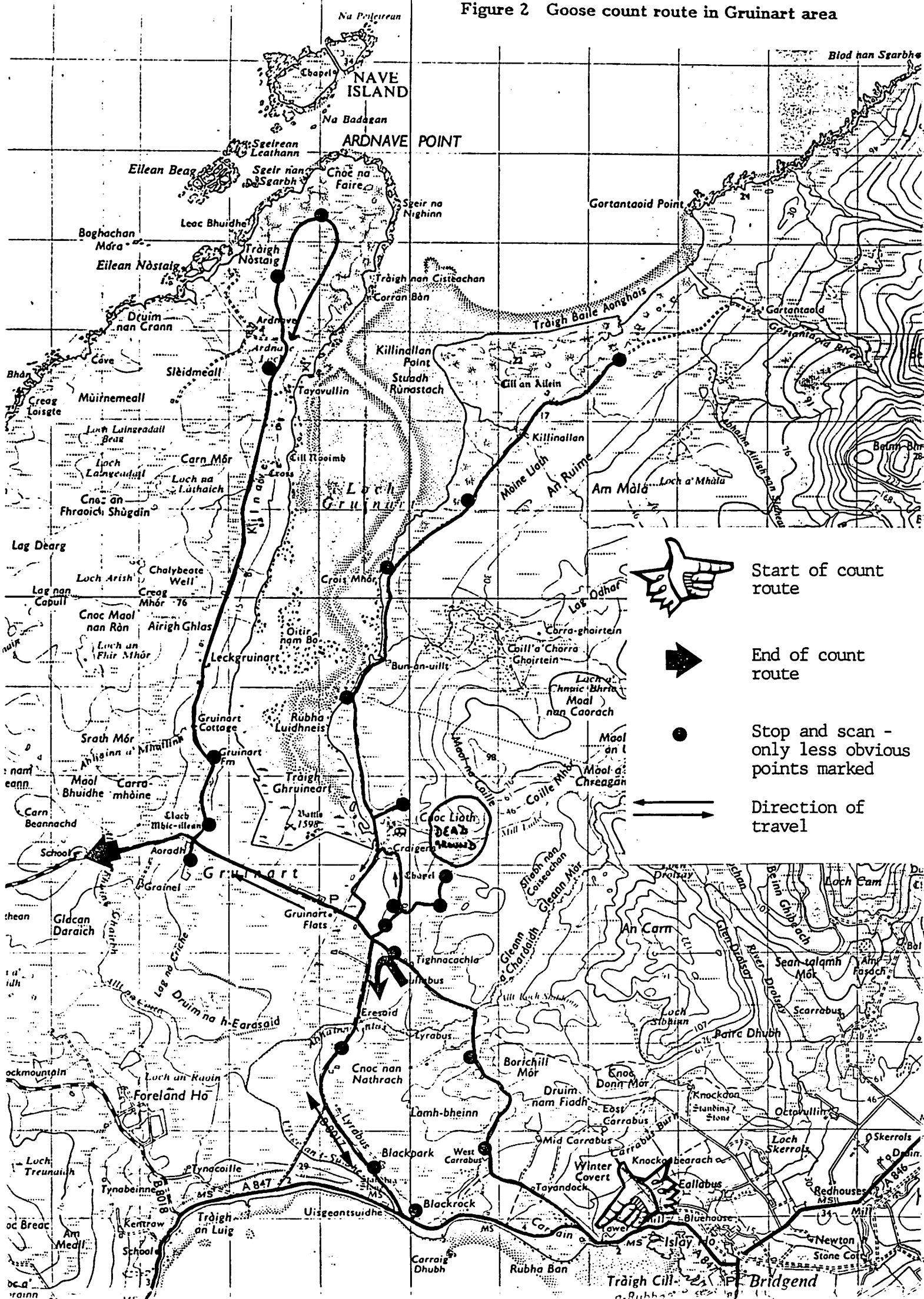


Figure 2 Goose count route in Gruinart area



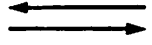
Start of count route



End of count route

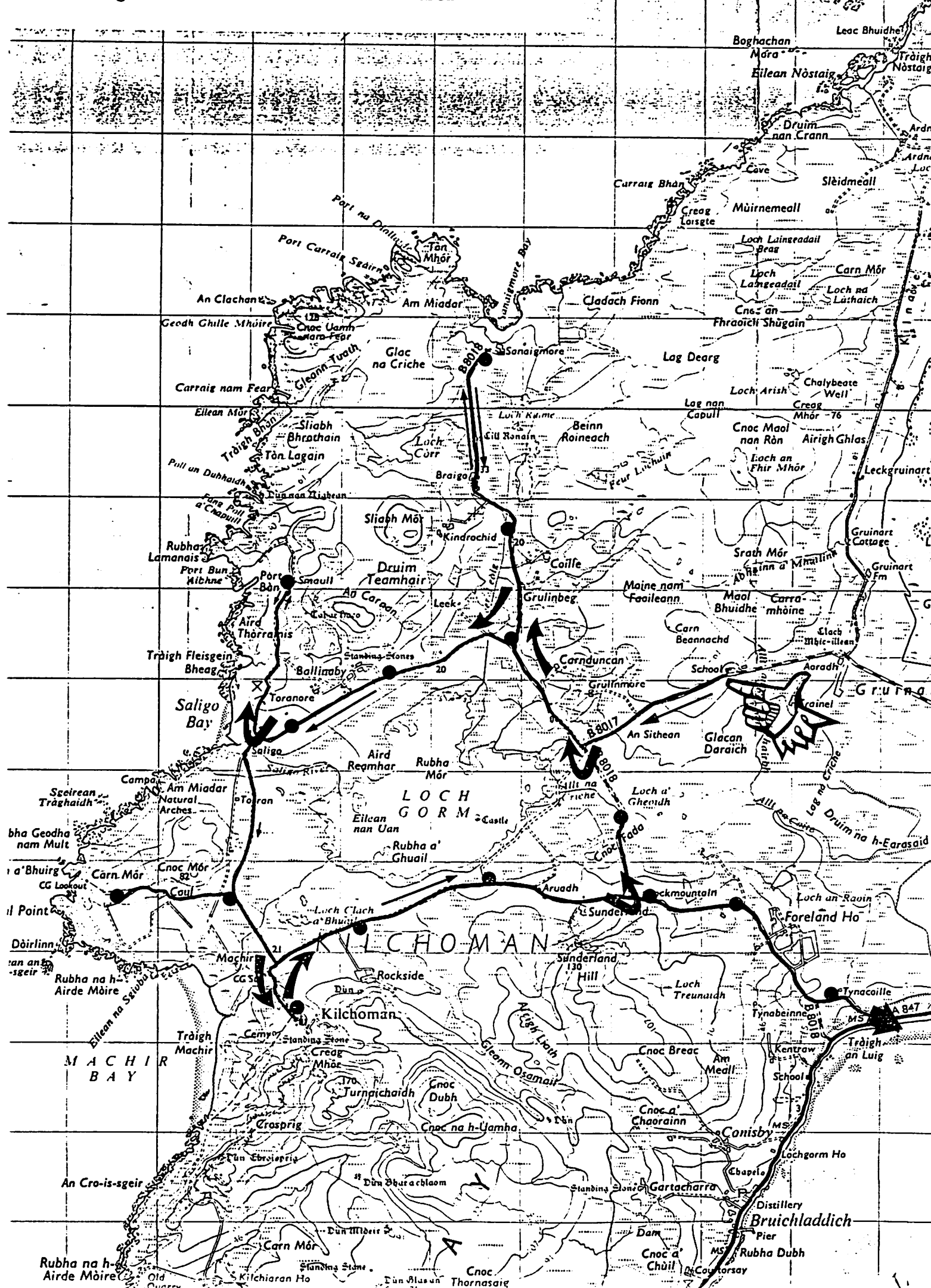


Stop and scan - only less obvious points marked



Direction of travel

Figure 3 Goose count route in Gorm area



## 5. RHINNS, OA AND ARDTALLA

Start at Carnain. Drive west along A847 and start counting (Figure 4), where the minor (closed) Lyrabus road joins the main road. Scanning Kentraw fields from here is often useful. Drive up to Kentraw and check fields behind. Then drive south to Conisby check low ground by scanning back from track above Conisby. Scan towards Gartacharra, drive south to Coultorsay, then drive up to farm and check fields to north. Drive south to Port Charlotte via Octomore.

From Port Charlotte drive to Bolsay, walk into the back of Bolsay and check improved fields; scan back to fields above Craigfad. Drive to Gearach and Kilchiaran. Drive part way up track to cliff top radio station and scan fields. Drive south towards Lossit via Tormisdale and Cultoon. Continue to Cladville, Balmeneach and Claddich, then to Port Wemyss and check fields south of A847.

Drive north along A847 past Wester Ellister to Craigfad. Care should be taken to avoid confusion with domestic and captive geese around the vicinity of the Easter Ellister Wildfowl Collection. Stop between Craigfad and Carn, walk uphill and check those fields out of sight of road.

Drive from the Rhinns to the Oa on the high road and start counting fields south of Torra (Figure 5). Drive south to Leorin checking fields on both sides of the road. At the junction with main road (A846) turn right and drive back to Machrie Hotel, Glenmachrie and aerodrome. Scan fields below Leorin. Take minor road from Glenegedale back to high road. Drive to Ballivicar via Imeraval. Drive down to Kintra checking marshy fields around Grianan and scanning Machrie. Walk up into fields to scan across areas out of sight from the road. Return along minor road and at the cemetery junction turn right to Oa.

Look for Whitefronts in marshy fields all the way along route, stop at Cragabus and scan improved fields. Stop as necessary to scan for Whitefronts. Drive up to Risabus and scan west through Luig an Tairbh. Drive south down short track to back of old Chapel. Get out and walk to ridge to check dead ground to south and west in Luig an Tairbh, there are often Whitefronts in these fields. Drive back to road and turn left and drive to Kinnabus, check Loch Kinnabus from hill above loch near farm. From Kinnabus to Lower Killeyan check carefully for Whitefronts. At Lower Killeyan walk downslope and check across to fields north of Giol in the distance and then back to Fang-Dhu.

Drive to Upper Killeyan and check all the fields round-about. On the return journey double check the rushy Fang-Dhu fields for Whitefronts, stopping north of Kinnabus road-end. Having completed the Oa, drive back to Port Ellen.

Drive to Kilbride (Figure 6), stopping at Brahunisary to check those fields above the farmhouse. From Kilbride take rough track back to main road. Drive on to Laphraoig and check fields around, on left, and above the plantation. Drive to Ardtalla, checking rough ground and green fields at Calumkill (drive to here). Stop to east of Lagavulin as road begins to climb and scan around. Stop at Kintour, check fields, drive to school, go to hillock in field on right scanning all improved fields. Drive to Ardtalla, and be prepared for geese in fields by farm. Check fields beyond farm.

If Ardtalla is checked first, before the start of the route, Barnacle geese may be seen before being disturbed by farm operations.

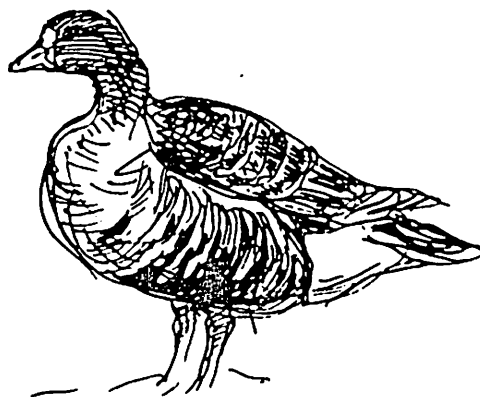
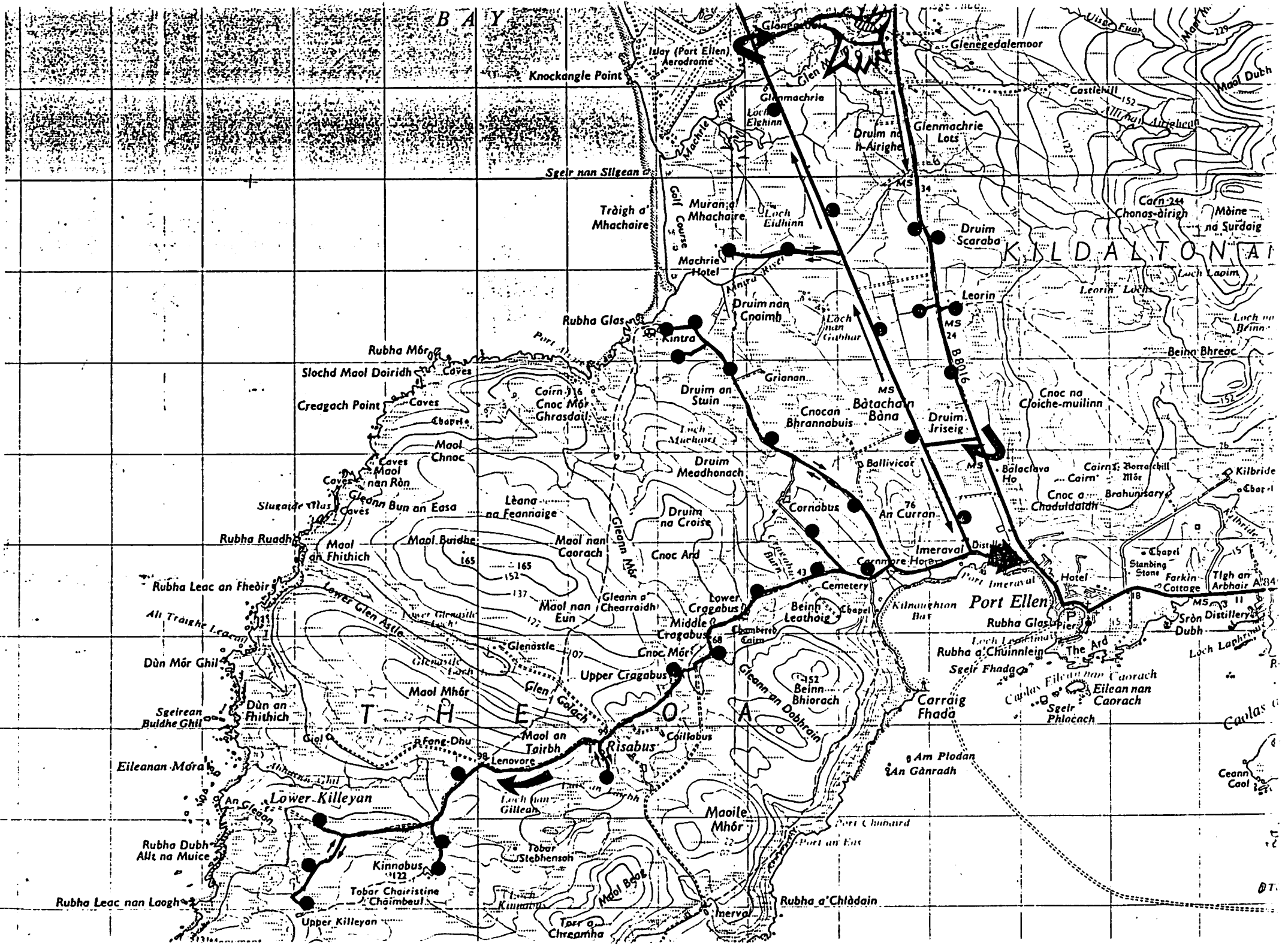




Figure 4 Goose count route in Rhinns area

G  
B A

Figure 5 Goose count route in Oa area







## 6. LAGGAN AND GLEN

Start at Carnain. Drive south to Duich farm (Figure 7), via Bridgend and Bowmore noting position of any flocks on the south flats of Loch Indaal (south of River Sorn). At Duich Farm park the vehicle on rise opposite farm and scan fields towards Cruach Mhor. Drive back north towards Island House stopping en route to scan Drochaid Bheag from the main road. Pull in at silage pit opposite Island Farm, walk to the rise at back of silage pit and from there scan the back of Corrary Hill and River Laggan. Then drive down Big Strand track checking fields by Island House and fields at Drochaid Bheag and Banaltrum Mhor, turn where track runs into dunes and return to main road.

Drive towards Bowmore, turn right after Laggan bridge to Corrary, leave vehicle at farm and walk towards Beinn Churlaich to scan Lon Ban and Cruach from the south. Stand on wall of old silage pit at Corrary to scan west towards Laggan Point noting position of any flocks which will be counted later. Drive back to main road and take track to Laggan farm counting all geese in the Laggan valley stopping as necessary. Large flocks close to the river may need to be counted by walking across fields and flushing birds. This is best done after counting Laggan Point. Leave car at cattle grid before Laggan farm and walk out to Laggan Point, taking care to close all gates securely.

Check fields beyond Laggan Point and then scan north towards Gartbreck. Check for Whooper Swans on Lochan na Nigheadaireachd. Then drive back to main road, turn left and stop just before Clachantachree and check fields on both sides of the road and Corrary Hill. Continue on main road and take Loanbaan turning on right, count geese in fields on both sides of this track as there is much dead ground above the level of the main road here. Return to main road and turn right, take first track to right and count any geese on both sides of this track too. Turn at top and return to main road.

Drive towards Bowmore checking fields on both sides of the main road and then turn left immediately before distillery warehouse at edge of village. Count all geese in fields on both sides of this road, driving past Ronnachmore, Ardlarach to Gartbreck stopping as necessary. Leave vehicle at Gartbreck and walk out to drystone wall south of here. There are two large fields occasionally used by

Barnacle geese here. Drive back to main road. (If there are geese in fields north of Ronnachmore drive to High School in Bowmore and scan south from there). Drive into Bowmore and to the Cottage hospital along High Street. From here fields within the dead ground (when viewed from Cruach road) can be checked.

Take the minor road to Cruach, stopping at radio mast and passing places to check south of the road particularly for Whitefronts. Stop just before the Tallant turnoff, stop and scan north of road. Drive to Tallant and leave vehicle at farm, walk to hilltop northwest of farm and count any geese to north and east which cannot be seen from elsewhere. Drive back to minor road, turn left to Laggan bridge, stop at left hand bend where the distillery lade crosses the road and walk out to the old cottage on the hill from where scan west along the Lon Ban valley for Whitefronts.

At Laggan bridge turn left stopping after approximately 200 m to check fields to east (Greylags are often here). Then take track right down to Avinlussa and count any geese on adjacent bogland (Whitefronts) and in fields close to buildings. Return to minor road and turn right. Drive to passing place opposite Mulindry track and stop. Scan all visible fields from here, continue to main road stopping at passing places to count geese on both sides. Then turn left towards Bowmore and count any geese on flats and saltings, turning around at the generating station to drive back towards Bridgend counting any geese south of the River Sorn on the way.

Take the minor road to Mulindry, check fields at Claggan and Springbank and then turn left to Gortanilivorrie. Stop here and walk up slope, across fields to south east, to check fields at back of Neriby. Drive back to the minor road stopping to scan the hillside of Ballitarsin. Turn left at minor road and drive to Neriby, stopping in passing places to check both sides of road. Leave vehicle at Neriby and walk up slope to check fields not visible earlier (from Gortanilivorrie). From Neriby drive to Mulindry checking all Mulindry fields and Ceannacroich.

Continue past Mulindry along rough track and scan all fields to north and south, if necessary walk to the riverbank to count geese towards Avinlussa. Drive to Cluanach (Figure 8) and turn right, counting any geese at Avenvogie barn, Avenvogie farm (drive up to farm to check for Whitefronts) and Avenvogie cottage. Turn left at high road and count any geese in fields at Torra. (In subsequent analysis care must be taken not to double-count geese here which may

also have been counted by the Rhinns team on their way to Oa and Ardtalla areas along the high road). Return back along high road, turn right at Avenvogie cottage and drive up to Kynagarry, leave vehicle at house and walk across fields to check dead ground to south and south east.

Drive back to the Glen road and turn right to Cattadale, Barr and Storakaig counting on both sides of road. Scan Loch Bharradail in the distance from the Glen road. At Barr, stop near the farm and if visibility permits, scan fields on far side of valley to north near Storakaig. These fields on the south facing hillside, become less visible as one proceeds down the road. Continue towards Knocklearach but turn right down rough track towards standing stone at NR 403641. Check dead ground to east. Continue north and check all fields around Knocklearach and at the back of Kilmeny. (From Knocklearach to the end of the route is within the Kilmeny count area although for convenience it is best counted by the Laggan and Glen team. Care must be taken to transfer the appropriate goose totals to the Kilmeny sub-total at the end of the day).

Drive to Lossit Farm, call at house to announce presence and then continue along farm track to count the fields above Loch Lossit and beyond Dun Bhoraraic. There are occasional Whitefronts here. It may be necessary to leave vehicle and walk to check fields above Loch Lossit, also scan back towards Knocklearach to check fields not in view earlier.

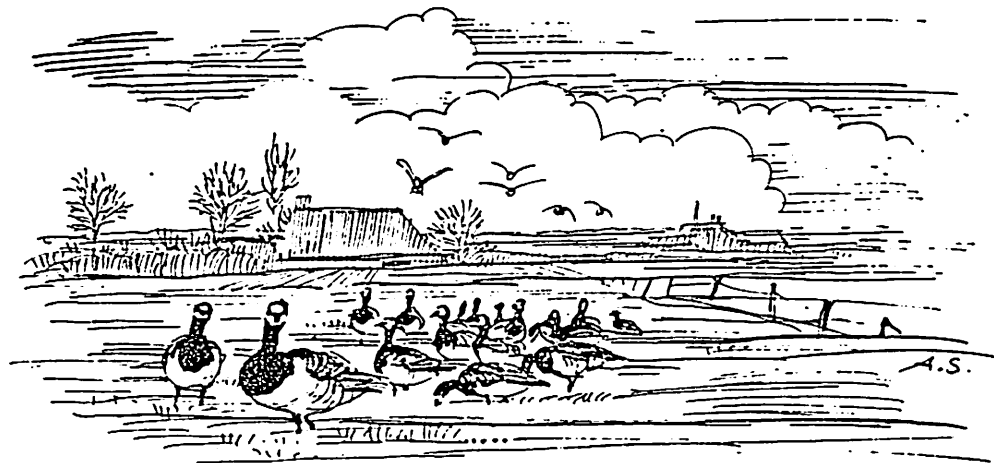
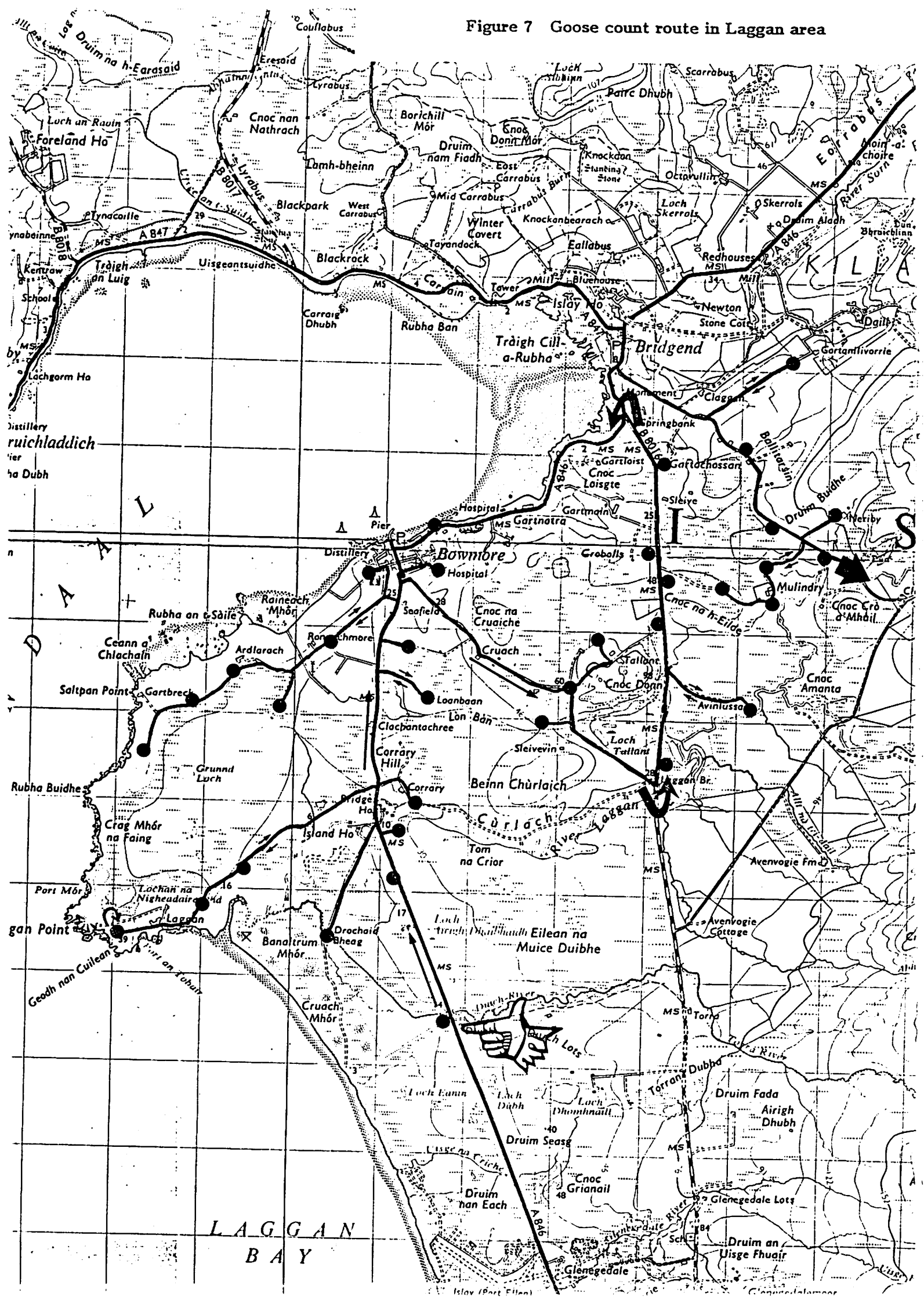


Figure 7 Goose count route in Laggan area



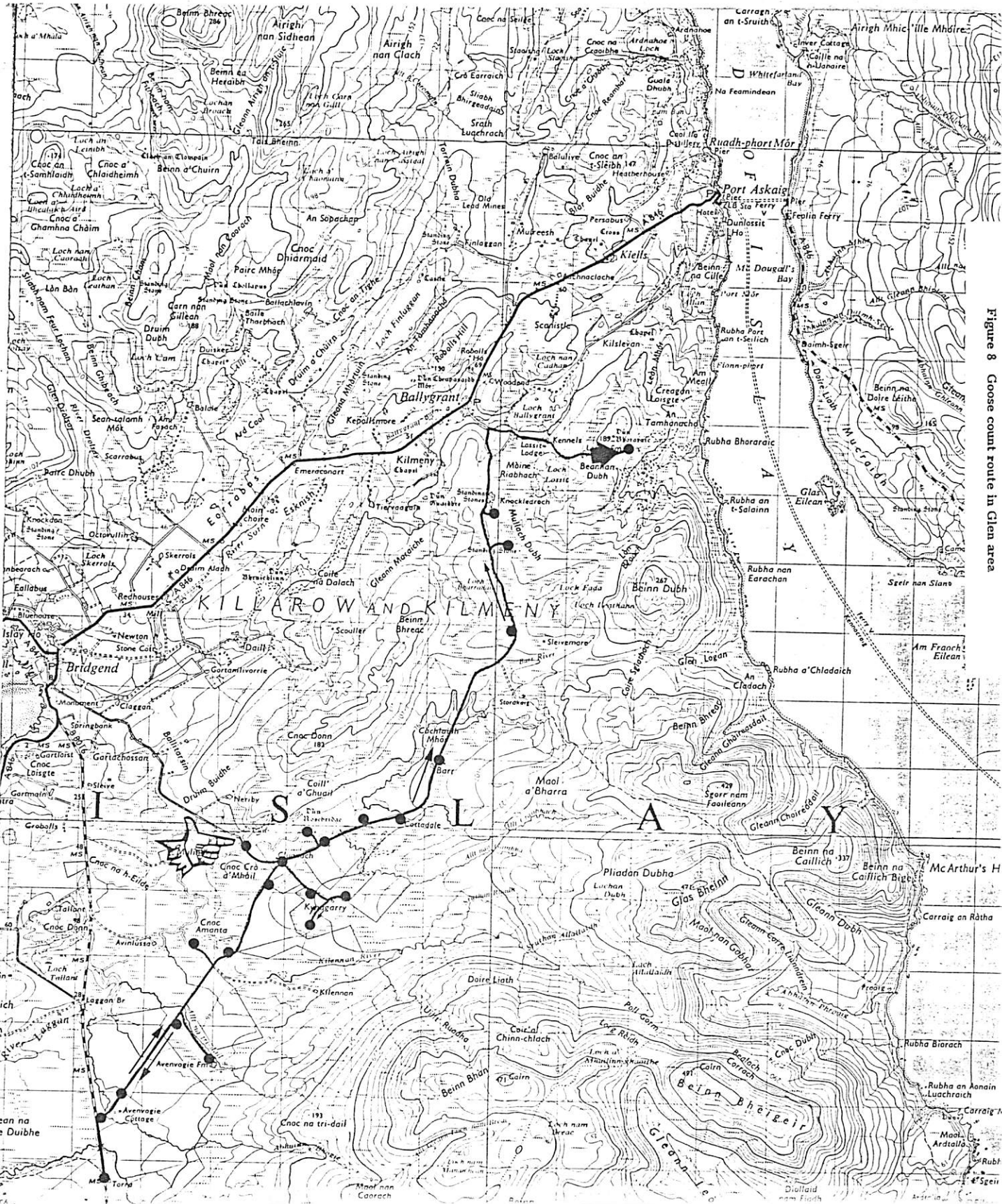


Figure 8 Goose count route in Glen area

## 7. KILMENY

Start at Carnain (Figure 9). Drive to gateway below Borochill Mor and scan fields east across to Knockdon, East Carrabus and Mid Carrabus. Drive back towards West Carrabus, checking fields on both sides of road. Stop at West Carrabus checking fields at Mid Carrabus, Blackrock (east) and Carnain area with the benefit of height. Stop below West Carrabus and count fields as appropriate. Then drive on to the silage feeder above Carnain, checking towards sea and fields at Winter Covert. Drive to Tower, check any remaining Barnacle geese on Bridgend Flats, then go up to fields behind Tower and walk east to check dead ground.

Drive slowly round to cattle market, stop by cottages and check flats once more. Drive to the cattle market, check, turn and drive back to Islay Estate (entrance by mill). Drive in to the cattle feeder to west of estate road and check those fields which are out of sight from elsewhere, then return to main estate road, checking fields on left. Drive to Home Farm, check fields to north at back of farmyard and scan towards Newton. Drive across farmyard, under arch, turn left and over the bridge above A846 to Bridgend fields. Check fields by footbridge, then drive along track opposite footbridge to check fields in dead ground behind Newton. Drive to Stone Cottage and check fields behind Newton. Drive out of estate to A846.

Turn left on main road, take first left to Knockdon checking fields behind Bluehouses. Drive down to Eallabus, get out of car, check fields to north-west behind Knockanbearach. Go back to track and turn left towards Knockdon. Stop car and walk up field on right to scan fields beyond Knockanbearach. Drive on, stopping at cattle shed, scan fields on left. Drive on scanning fields on right, then turn at Knockdon road end scanning fields on hillside around farm. Turn and head back towards main road.

Drive to Loch Skerrols past the rubbish dump, check fields at Octovullin and the lochside where there can be flocks of disturbed geese taking refuge. Return to main road, drive down to Newton checking fields. When driving into Newton, scan fields in the distance above Neriby. Check fields at Redhouses, turn left up road to Scarrabus and stop by Harrison's wood-yard and walk back to A846 to check fields to south of main road. Drive up road checking fields at Octovullin and Skerrols. Drive into Skerrols and check fields below the farm. Drive on to Scarrabus, checking fields on both sides of road.

At junction of farm tracks, leave the passenger to count fields at Eorrabus and check for flock movements. Drive rapidly to Scarrabus, checking fields behind farm. Continue on to Balole checking fields all round farm. Leave car at Balole, walk to hill at approximately NR 360665. Scan fields behind Eorrabus and check Ballimartin and Esknish. Run back to car, pick up passenger, drive to main road checking fields to left and right.

Turn left on A846, drive to Ayen counting on both sides of road. Turn and drive back to Woollen Mill. Drive to Dail checking fields on left of track especially just through gate, go through farm leaving car near cottage above the farm. Walk up onto hill up track, scan to Gortan and to north-west. Check fields behind Neriby. Return to car and drive to Ballimartin checking fields beyond Ayen. Continue beyond Ballimartin up towards Ballachlaven.

Leaving the car at the Ballachlaven gate, check Duisker and the ruined cottage to the north-west. Walk on towards Ballachlaven checking fields. Meanwhile the passenger can walk onto Druim a'Chuirn checking fields below and around the south west end of Loch Finlaggan and be collected near Ballimartin later. Also check fields behind Ballimartin Farm. Return to car, drive to Keppols. From the Kepollsmore Farm scan Kilmeny, Tiervaagain and Aluchga. Drive up to Tiervaagain, (which requires four wheel drive) leave car and walk out and check fields over hill beyond farm.

Return to the main road, checking fields at Kepollsmore, and continue along the main road checking fields at Kilmeny and Ballygrant. Check the fields at Robolls and Woodend and then scan Loch nan Cadhan. Drive on checking the fields on both sides of the road and turn left to Finlaggan. Drive to Finlaggan checking fields on both sides of track. At the farm check fields behind house. Return to minor road, drive on to Mulreesh and check the fields to east behind Kiells. Walk out to check the field by the old lead mines. Drive to Balulive gate and scan fields to south-east of Balulive. Walk up deer fence in north to check fields to south-west of farm and scan all the ground north-east towards Loch Staoisha. Scan all ground towards Staoisha and behind farm. Return to main road scanning fields behind Auchnaclache, and Scanistle from road before the turning to Finlaggan.

Drive along main road towards Keills, stop on old road at top of slope on right, and scan fields to south and south-east. Then walk down field to check the depression behind trees. Drive on through Keills checking fields to left and right.



Turn at the Caol Ila road end, drive back to sewage works, leave the car and walk out onto hill beyond stream. Then check fields to south east and scan back towards Scanistie. Drive to Bunnahabhainn checking fields at Heather House and Caol Ila. Drive up track beyond Ardnahoe past peat cuttings to check fields at end of track, return scanning the improved fields around Loch a' Chnuic Bhric on Jura for Whitefronts if the visibility is good. Drive to Bunnahabhainn to conclude Kilmeny area.

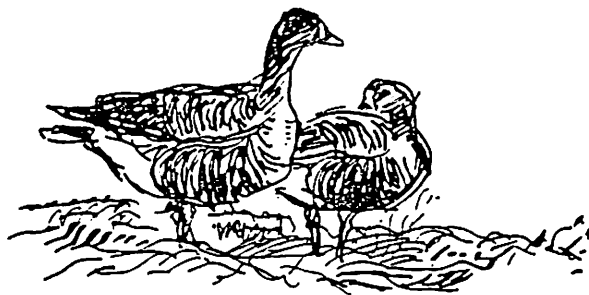




Figure 9 Goose count route in Kilmenny area

## 8. ANALYSIS

At the end of the day the counts from each area are totalled. There are various problem areas where, due to the presence of feeding sites close to the area boundaries, it is possible to erroneously count the same flock twice.

These areas are as follows:

From Blackrock (Kilmeny) to Uisgeantsuidhe (Gruinart) where there can be interchange particularly of Barnacle geese between the time when the Kilmeny team counts Blackrock (early) and the time when the Gruinart team counts Uisgeantsuidhe (later).

The fields around Foreland sometimes contain Whitefronts which can have moved from Kentraw. The problem here is that the Kentraw fields are counted by the Rhinns team at the very start of the day, whilst the Foreland area (north of B 8018) is not counted by the Gorm team until the end of the afternoon. Care must be taken over similar sized flocks of the same species in these two areas.

There may be movements between that part of Kilmeny area which is counted by the Laggan and Glen team on their completion of the Glen. The totals for this area (Knocklearach and Lossit Farm) need to be transferred from the Glen records to the Kilmeny total.

There are always problems in the region of Mulindry Farm where Laggan and Glen areas abut. Here, perhaps, the distinction between the areas is weakest although as both areas are covered by the same team there is little risk of double-counting. The problem is rather the allocation of flocks to one area or another.

We have not found evidence for movements during the day between Kilmeny area near Dail and Laggan area near Gortanilivorrrie/Claggan, but this would be possible for Barnacles and should be borne in mind when the counts for these farms are compared.

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