

Lough Neagh and Lough Beg

Wintering waterbirds

Recent changes in diving duck populations

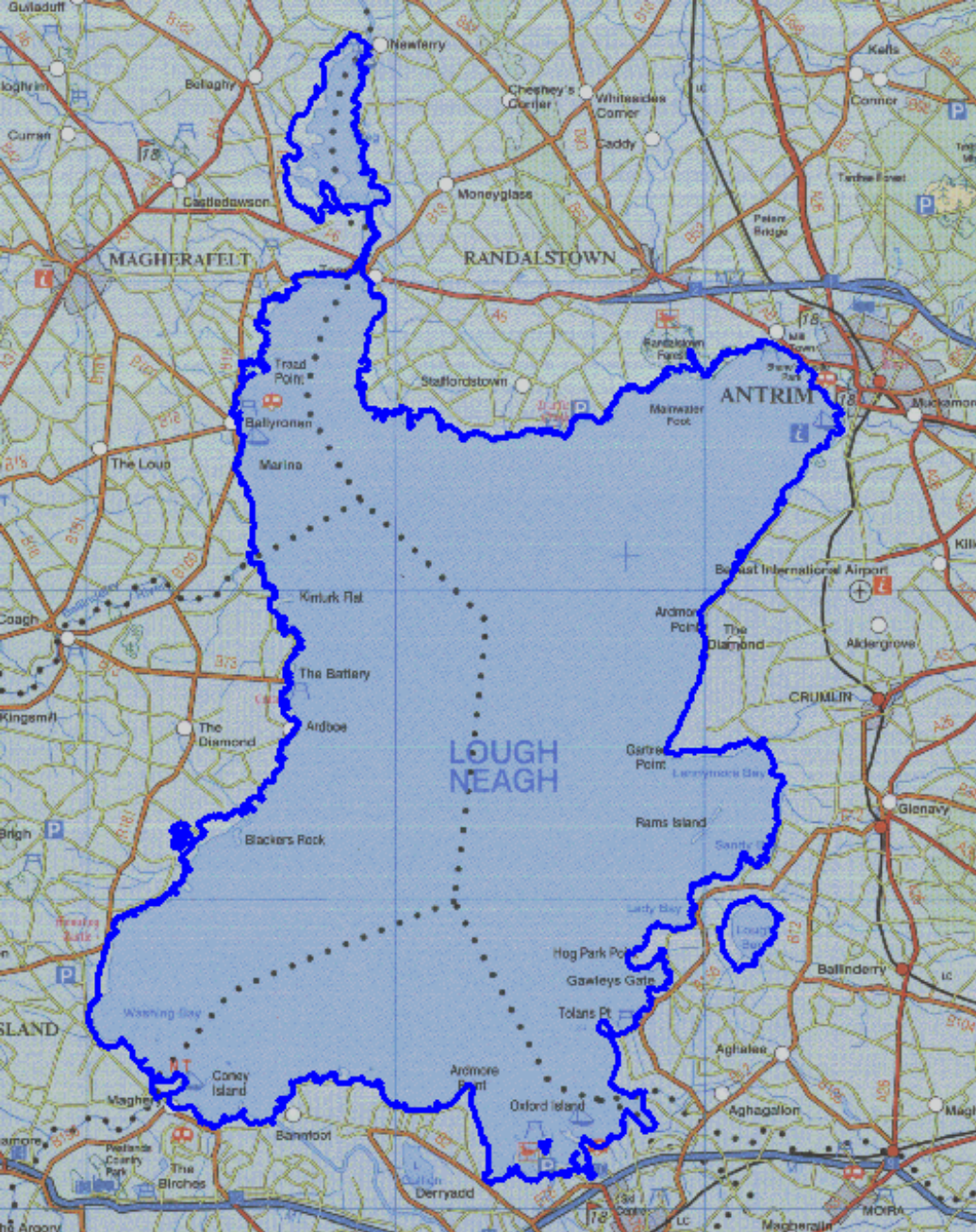
Ian Enlander

EHS

Recent changes in diving duck populations in the Lough Neagh basin

1. Review of diving duck populations – going, going, gone?
2. Reviewing the reviews – recent reports to EHS
3. Euring - a new approach to understanding population change?
4. Future priorities

Lough Neagh and Lough Beg SPA



General Statistics

- Largest freshwater lake in Ireland or Britain
- Area 383 km² with retention 1.3 year
- *Ca.* 30 Km along longest axis by 12.1Km wide
- Mean depth 8.6 m - 8.9 m
- 3% deeper than 20 m
- Generally well mixed
- Naturally eutrophic

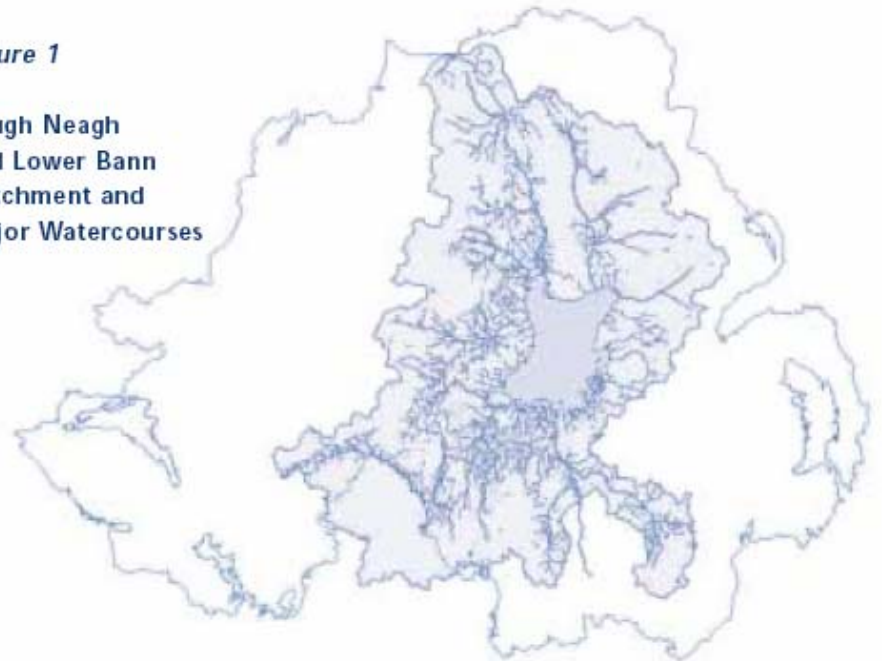
Catchment usage

- 80% classified as agricultural
- 90% of this permanent pasture
- Extensive forestry in upper catchment
- Substantial conurbations



Figure 1

Lough Neagh
and Lower Bann
Catchment and
major Watercourses



Why is Lough Neagh so Important to Wildfowl?



- Excellent food resource – *Chironomid* larvae
- Plenty of shelter
- Good depth for “divers”

Lough Neagh and Lough Beg

Most important site for diving duck in GB and Ireland

Late 1980s - early 1990s.

40,000 Pochard, 30,000 Tufted Duck, 5,000 Scaup and 14,000 Goldeneye

> 100,000 waterbirds in total – most important in Ireland – top 10 in UK
(2001/02)

Decline since then with (2006/07)

9,000 Pochard, 6,000 Tufted Duck, 4,400 Scaup and 3,000 Goldeneye.

Scaup numbers have since recovered – currently highest counts ever.

Slight recovery of Pochard numbers over past 3 years

Presently 50,000 – 60,000 waterbirds – 2nd in NI – 19th UK (2005/06)

WEBS data - essentially complete coverage since 1985/86

Feature Type	Feature	ASSI Population	SPA Population
Species	Whooper Swan	1152	923
Species	Bewick's Swan	314	251
Species	Great Crested Grebe	1173	741
Species	Pochard	31508	32165
Species	Tufted Duck	19372	23476
Species	Scaup	1584	2557
Species	Goldeneye	11521	12479
Assemblage species	Little Grebe	395	390
Assemblage species	Cormorant	815	781
Assemblage species	Greylag Goose	120	129
Assemblage species	Shelduck	142	165
Assemblage species	Wigeon	2607	3447
Assemblage species	Gadwall	120	114
Assemblage species	Teal	2288	1868
Assemblage species	Mallard	5330	4982
Assemblage species	Shoveler	169	173
Assemblage species	Coot	5979	6676
Waterfowl assemblage	Waterfowl Assemblage wintering population (Component species: Whooper Swan, Bewick's Swan, Golden Plover, Great Crested Grebe (wintering) Pochard, Tufted Duck, Scaup, Goldeneye, Little Grebe, Cormorant, Greylag Goose, Shelduck, Wigeon, Gadwall, Teal, Mallard, Shoveler, Coot, Lapwing)	87049	79915

Designations

Lough Beg ASSI

08/1987

Lough Neagh ASSI

11/1992

Portmore Lough ASSI

02/1994

SPA classified

04/1999

SPA wintering features shown

Pochard - annual max count and 5 year mean

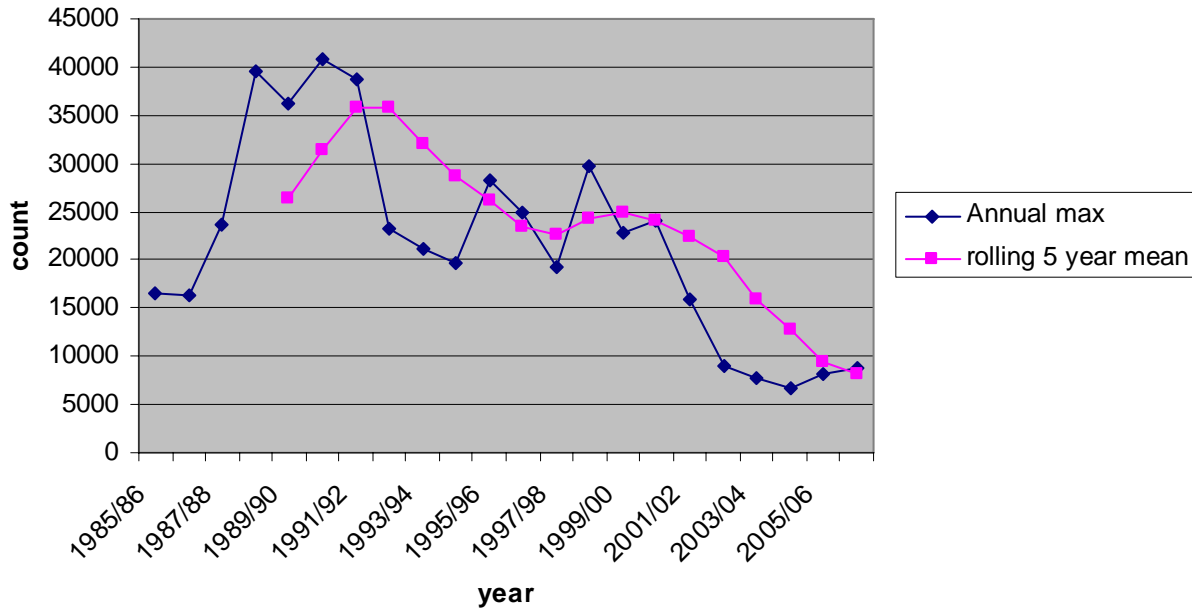


Figure 26.a, Annual indices & trend for Pochard for GB (above) & NI (below).



Tufted Duck - annual max count and 5 year mean

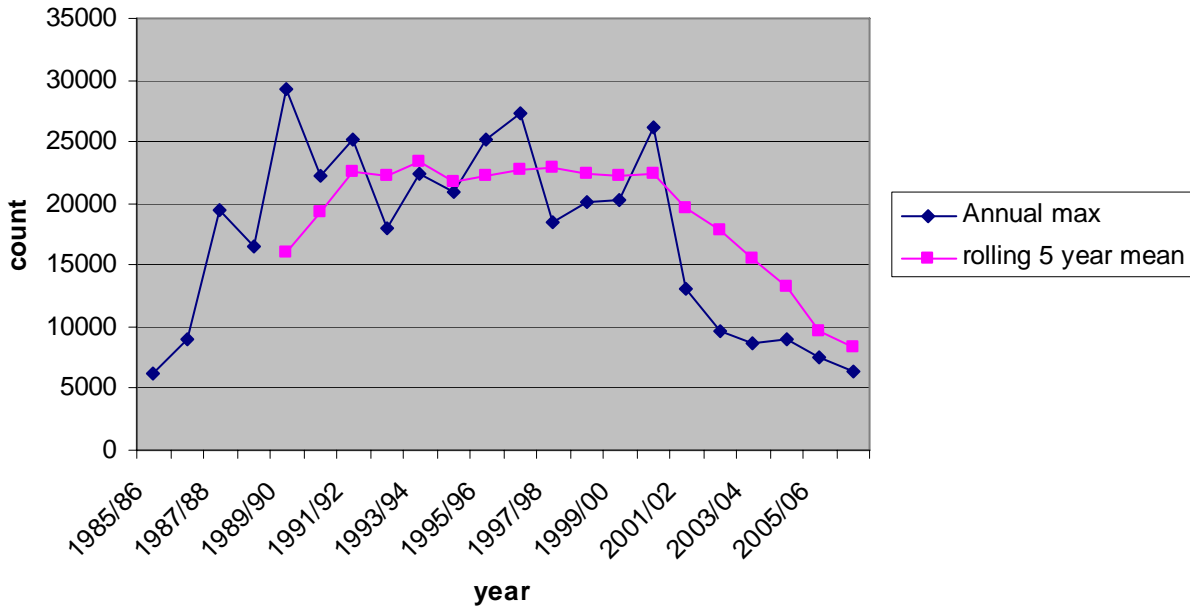


Figure 27.a, Annual indices & trend for Tufted Duck for GB (above) & NI (below).

Scaup - annual max count and 5 year mean

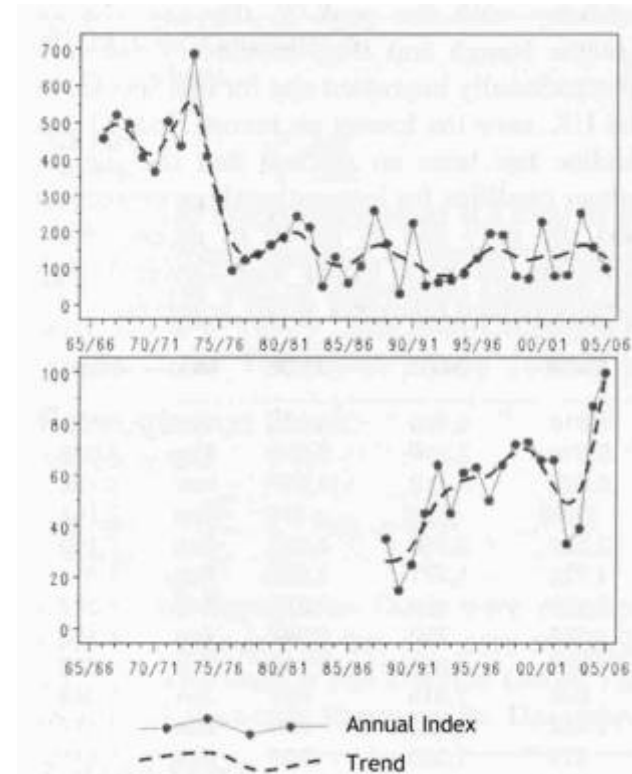
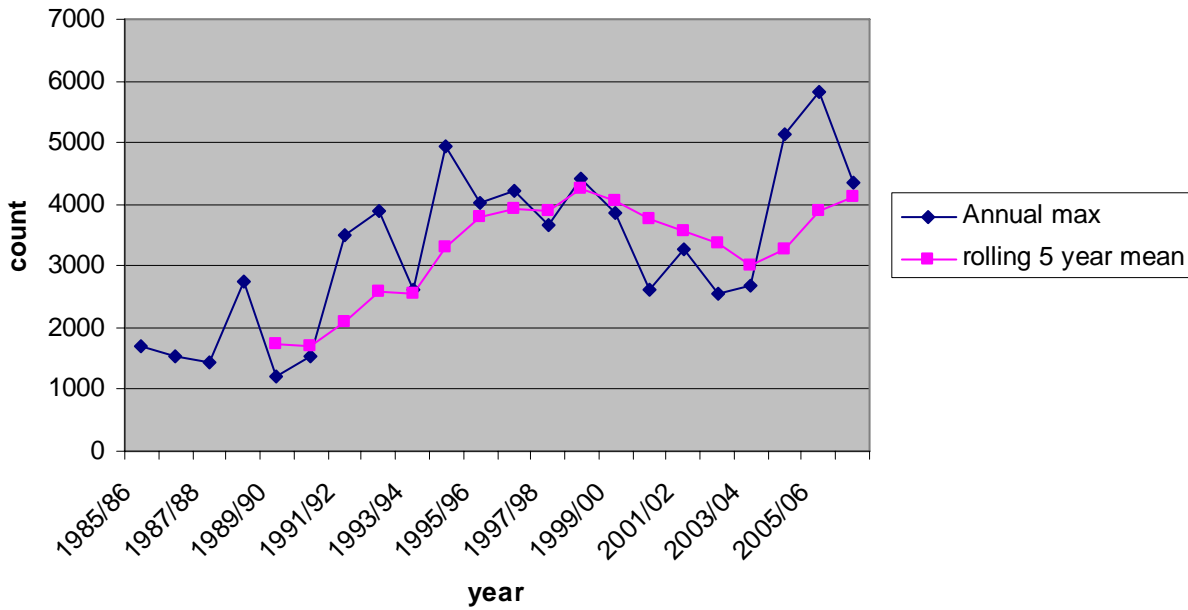
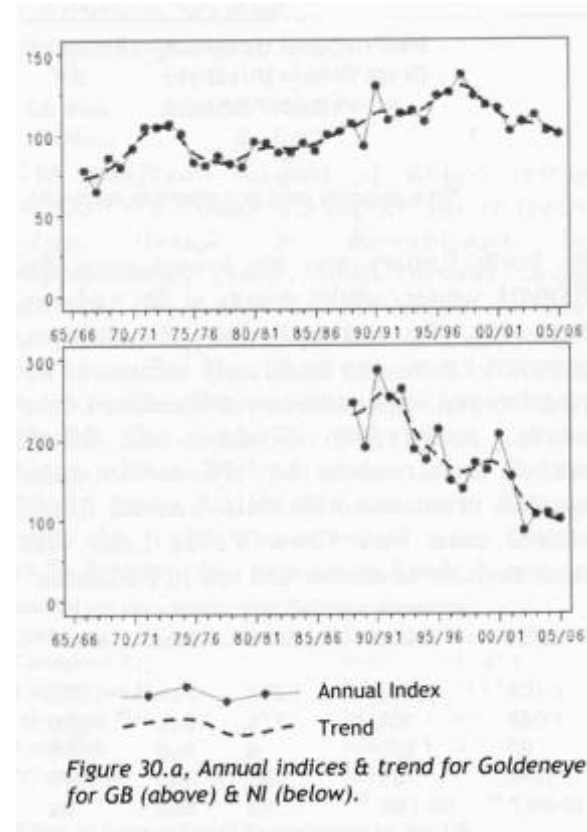
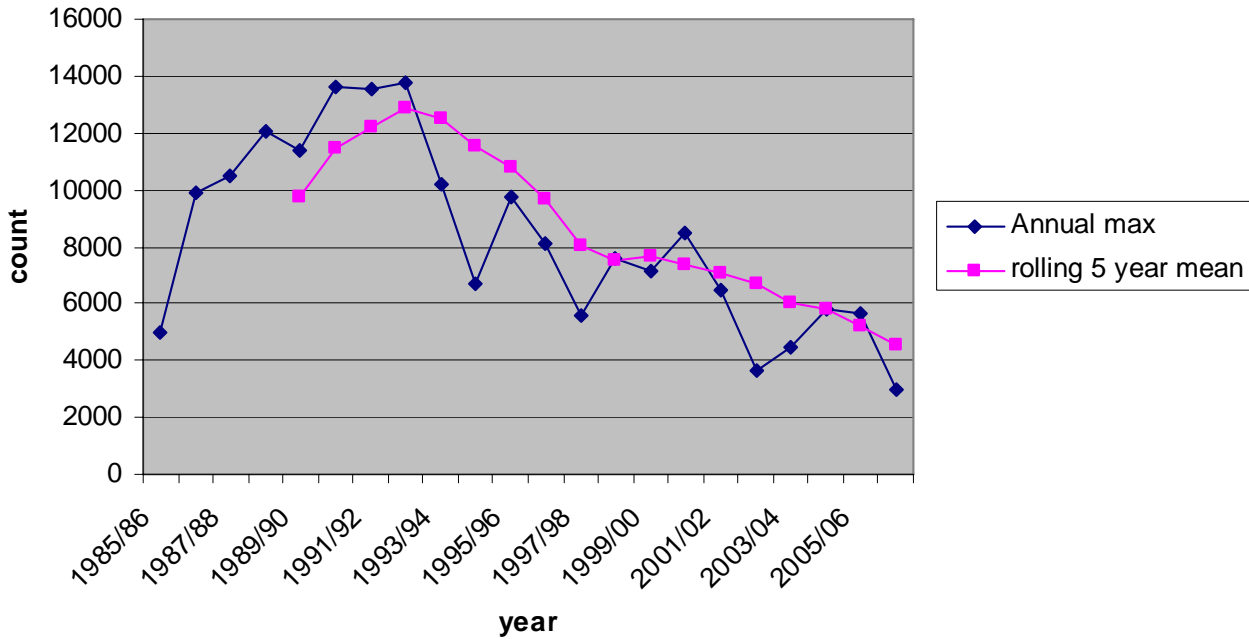
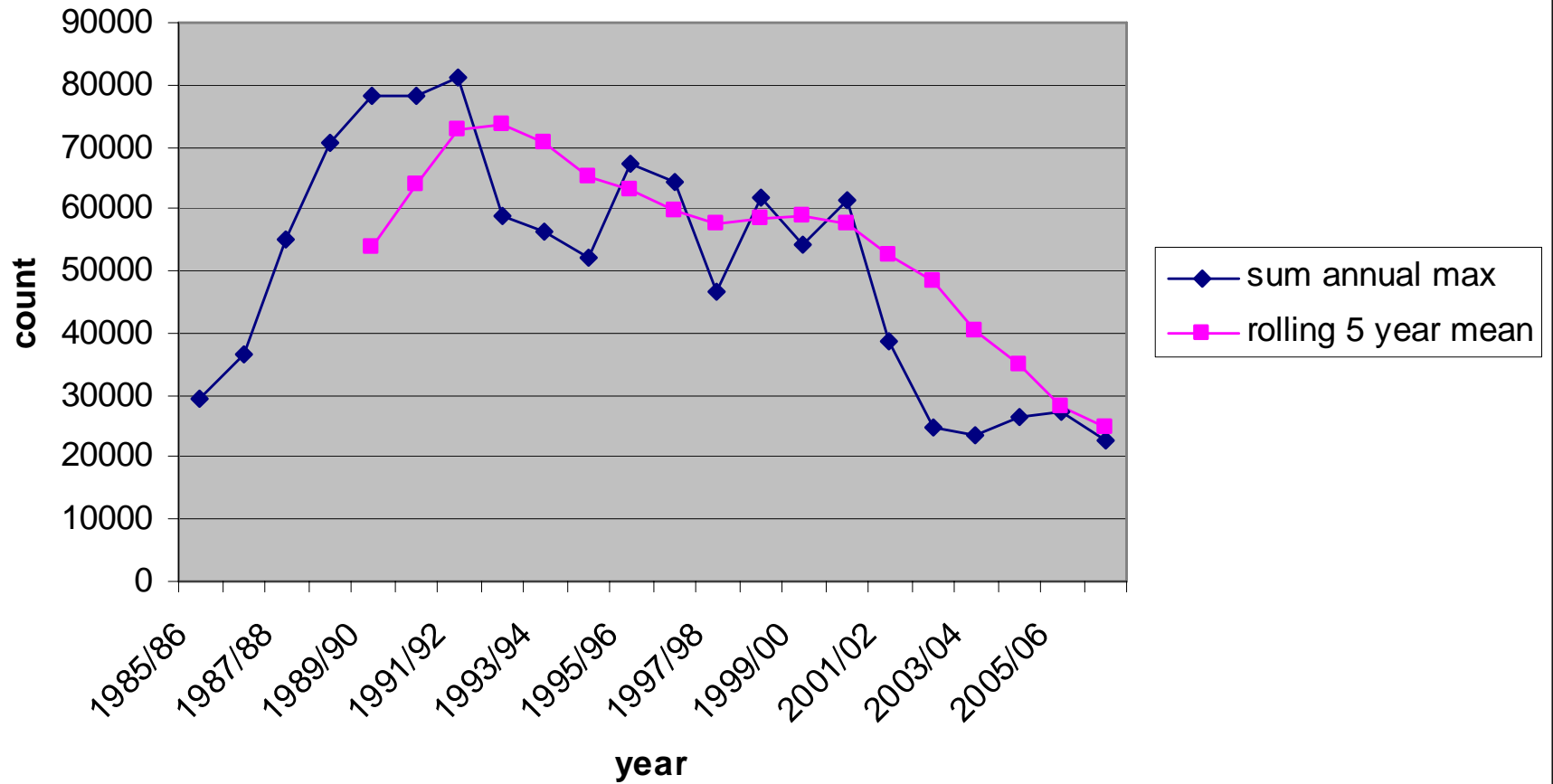


Figure 28.a, Annual indices & trend for Scaup for GB (above) & NI (below).

Goldeneye - annual max count and 5 year mean



Total diving duck population - annual max and 5 year mean



Dabblers



No downward trends in Wigeon or Mallard – the two most abundant dabbling ducks.

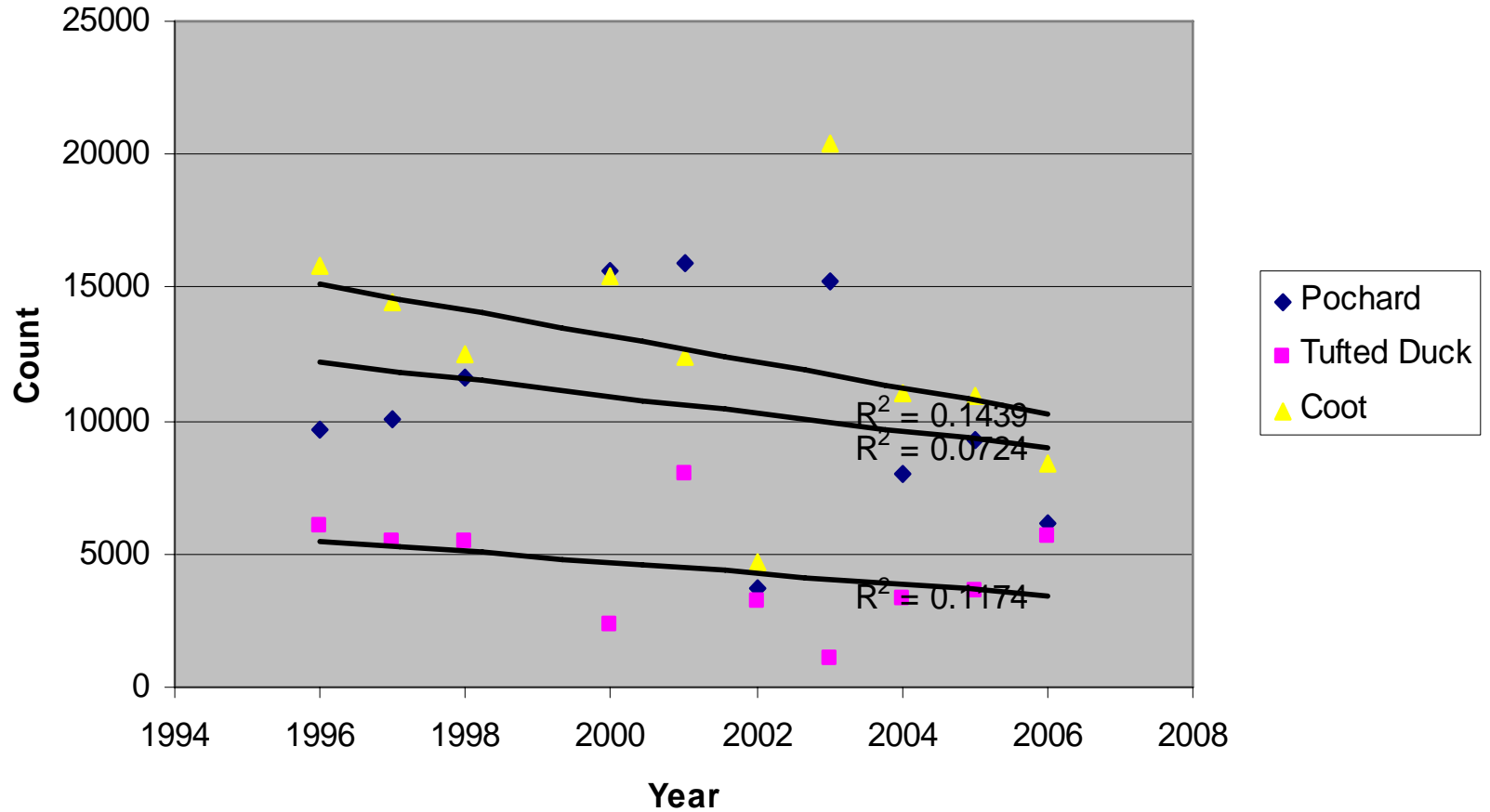


Coot have declined (e.g. mean 4963 1999/00 – 2003/04 to 2506 in 2005/06) – a separate issue?

Consequences?



Lough Corrib wintering waterbirds



Expert report summary findings – Allen and Mellon - 2004

1. Three of the four diving duck species of international importance (Pochard, Goldeneye and Tufted Duck) declining since winter 2001-02.
2. Scaup have maintained their numbers suggesting that any effects are selective.
3. This may indicate a different preferred prey or feeding strategy to the other three species.
4. In site factors such as disturbance, netting, counting error etc are unlikely to be significant but netting in particular needs further clarification.
5. Water quality could differentially impact key lakebed invertebrate groups or species with selective consequences for food availability. No observed dramatic changes in other groups e.g. fish or more diverse invertebrate populations. Indicator species suggest better than 'good' water quality.
6. 'European populations of the four species are generally stable but some e.g. Goldeneye are increasing. Population falls unlikely explanation for the declines.
7. 'Our' Scaup originate from Iceland whereas Goldeneye and Pochard come from NE and E Europe. Migrants could avail of alternative wintering sites. Tufted Duck are partially affected in that they have populations originating in NE Europe, Iceland + residents.

Expert report summary findings – BTO - 2006

1. Declines occurred throughout site +/- simultaneously - do not appear to be related to a factor specific in one part of the SPA.
2. Declines in Pochard, Tufted Duck and Goldeneye are an order of magnitude greater than declines occurring at any other site in GB or Ireland. Declines do not parallel trends in other regions of GB and Ireland or in wider European region.
3. No clearly identified factor driving decline.
4. Relocating to sites elsewhere in Great Britain or Ireland - magnitude of increases is considerably smaller than decreases at Lough Neagh while there has been decreases at other UK sites.
5. Pochard, Tufted Duck and Goldeneye have increased in the Baltic-Nordic Region and in Central Europe. Changes most probably due to climate change. This may have facilitated relocation from Lough Neagh and Lough Beg. At this stage, this suggestion cannot be confirmed.
6. Ecological changes in Lough Neagh system appears to be best explanation.

Natural re-distribution model

- We are +/- at end of the flyway – perhaps changes will be most marked here
- The 3 declining species come mainly or totally from E and NE Europe
- Pochard and Goldeneye declines have been greatest – many wintering options on flyway
- Scaup from Iceland have fewer/no other stop-over options on their route.
- Wintering Tufted Duck population here is of mixed mainland Continental and Icelandic origin.
- Decline for this species is intermediate compared with Pochard and Goldeneye.
- Large wintering populations in Europe unlikely to allow 'missing birds' to be identified.

COMMON POCHARD

Fig 7. Locations overseas and all included exchanges of Pochard between (a) southeast Britain, (b) southwest Britain, and (c) Ireland, and abroad.

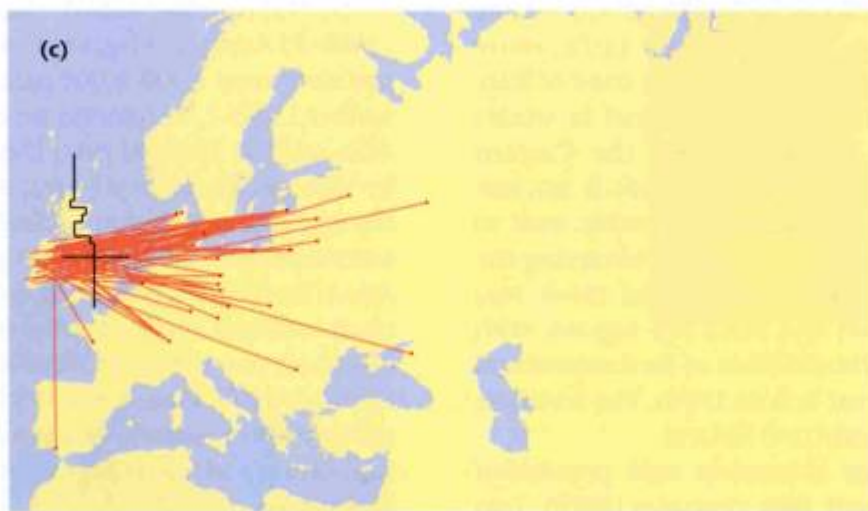


Fig 6. Locations in the breeding season, and all movements, of 289 Tufted Ducks present in Britain & Ireland during winter.

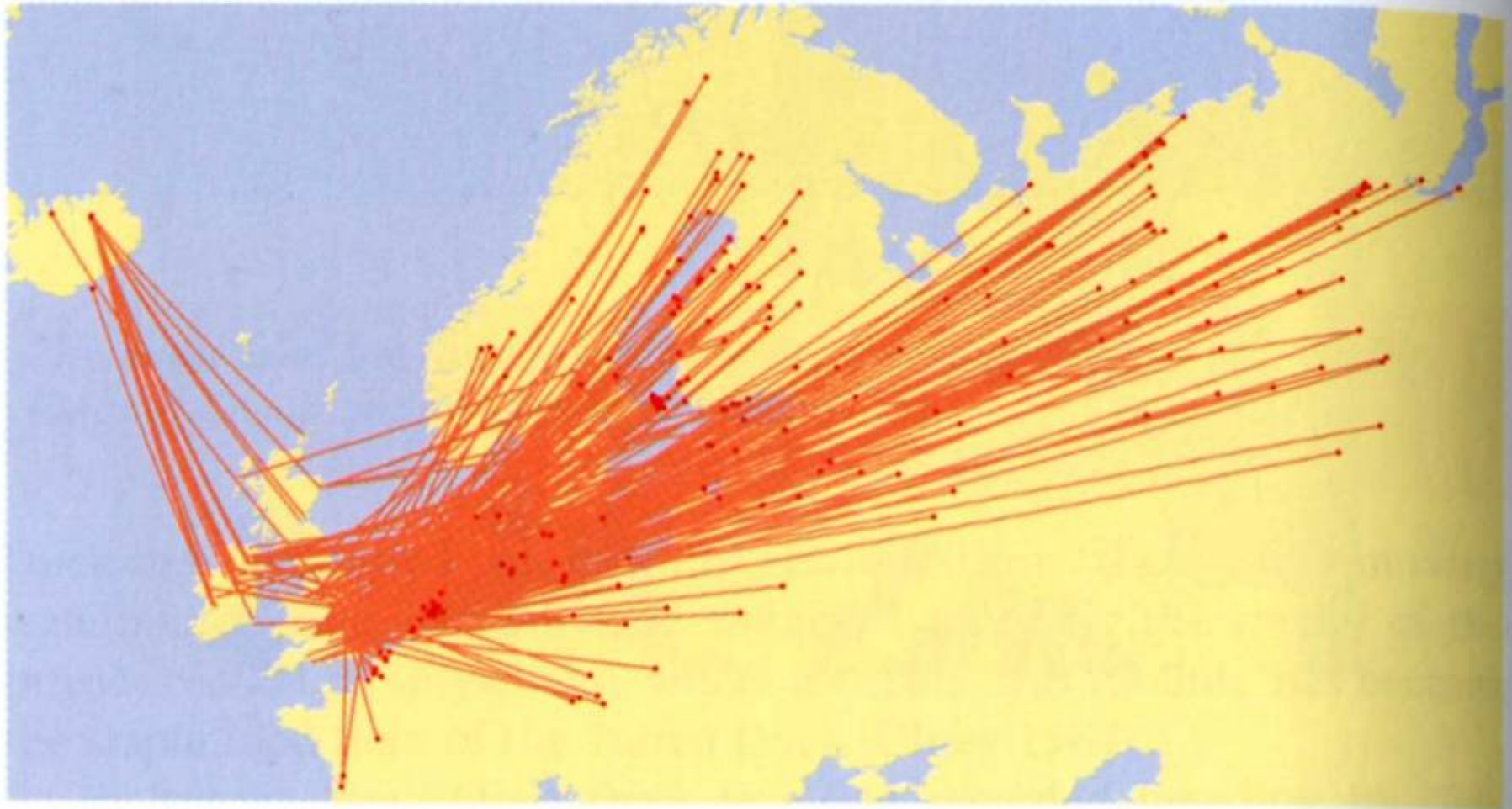


Fig 4. All 92 included exchanges of Scaup between Britain & Ireland and abroad.

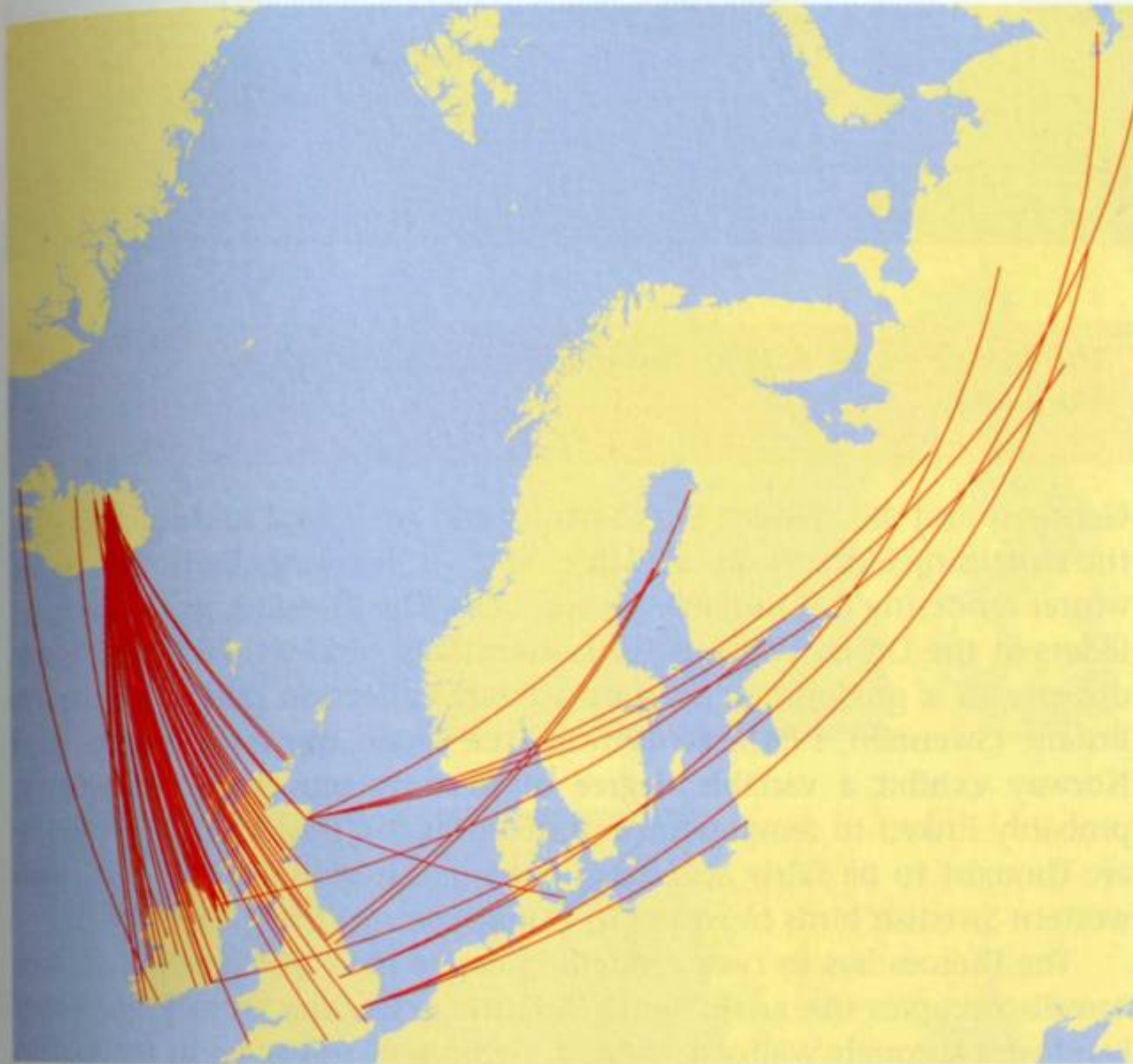
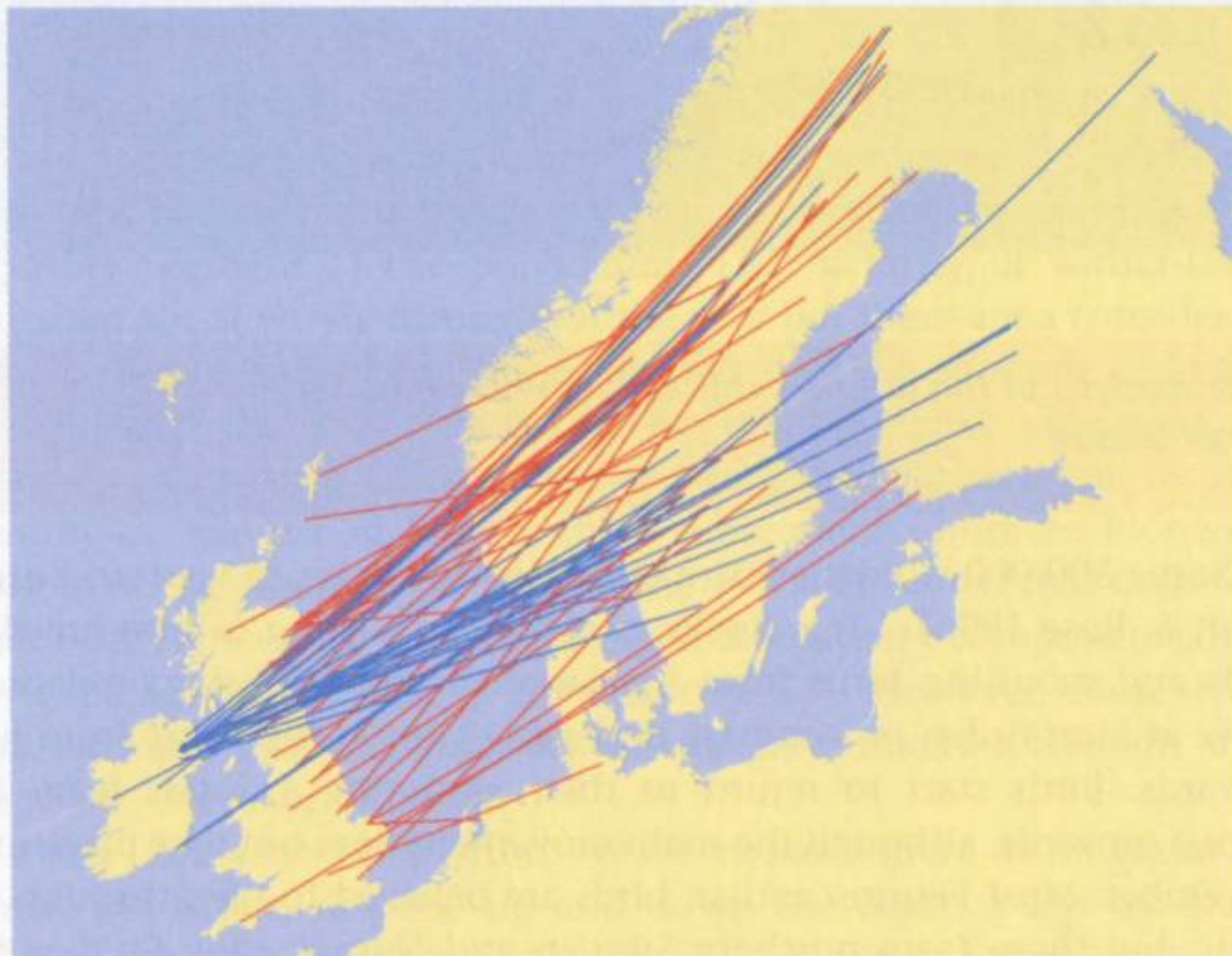
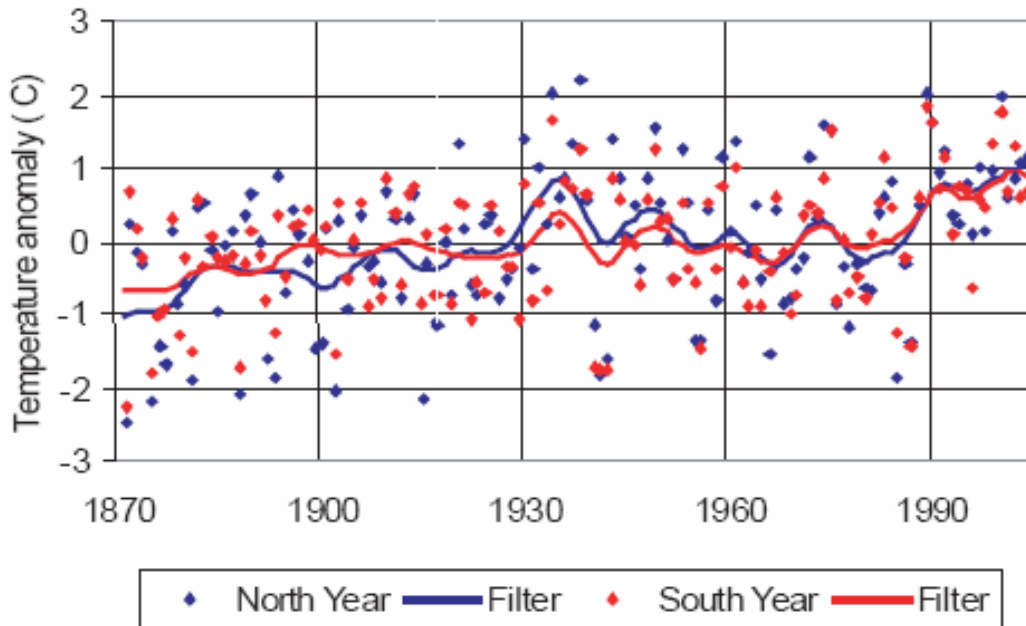


Fig 4. All included exchanges of Goldeneye between Britain (36, red) & Ireland (23, blue) and abroad.





Climate change in the Baltic

Air temperature trend – Baltic Sea

During the past ten years, all ice winters have been average, mild, or extremely mild. The length of the ice season showed a decreasing trend by 14–44 days during the 20th century

Baltic Sea Environment Proceedings No. 111
Climate Change in the Baltic Sea Area
HELCOM Thematic Assessment in 2007

Table 1. **Numbers** counted of **some** species at country-wide surveys of the coast from northern Halland – northern Kalmarsund, including Öland and Gotland.

Species	1971–1974	2004
<i>Anas platyrhynchos</i>	28,000	73,400
<i>Anas penelope</i>	40	5,550
<i>Aythya fuligula</i>	52,500	149,000
<i>Bucephala clangula</i>	17,300	32,000
<i>Somateria mollissima</i>	3,200	9,700
<i>Mergus merganser</i>	3,600	8,400
<i>Cygnus olor</i>	5,900	20,700
<i>Fulica atra</i>	13,400	16,600
<i>Phalacrocorax carbo</i>	1,400	8,700

Changes in wintering bird populations in the Baltic

“there are indications on cases where the changes reflect genuine changes in the population level”

Nilsson, L (2005) Long-term trends and changes in numbers and distribution of some wintering waterfowl species along the Swedish Baltic coast. Acta Zoologica Lituanica, 2005, Volumen 15, Numerus 2

Linear regression r^2 values

Lough Neagh –
annual max v's annual max

Relationship strongest between
similar breeding populations -

	P	T	S	G
P	-	<u>0.5763</u>	0.119	<u>0.6802</u>
T	-	-	0.0169	<u>0.3907</u>
S	-	-	-	0.1243
G	-	-	-	-

Euring

Centralised data collation service for European bird ringing returns –
currently managed by BTO

Data used to see if there is any evidence of migratory short-stopping

Data for Pochard, Tufted Duck and Goldeneye

No data made available from Russia –
likely to be significant for Pochard and Tufted Duck especially

46,000 ringing returns analysed

Data preparation –

- select ringing returns for Nov – Feb – birds assumed to be on wintering grounds
- filter out distance moved < 100km tend to be short period controls
- time series analysis

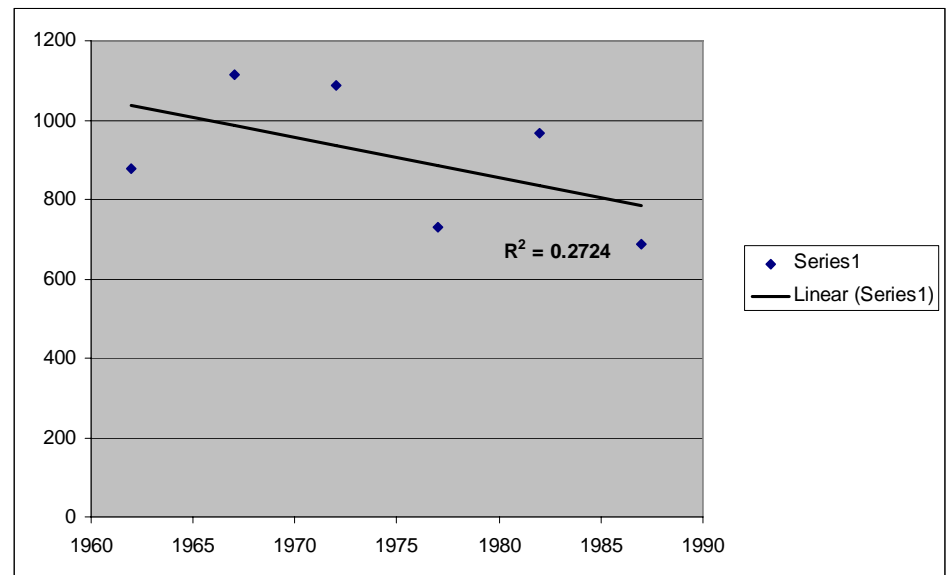
1. Collated birds handled on breeding grounds (breeding adults or nestlings) – very poor dataset
2. Lough Neagh/ Northern Ireland returns too small to be meaningful
3. Source areas - for evidence of change in average distance between ringing and capture points
4. Western recovery areas – for evidence for change in proportion of ringed birds recovered compared to dataset as whole

Statistical approaches – a dabbler on thin ice



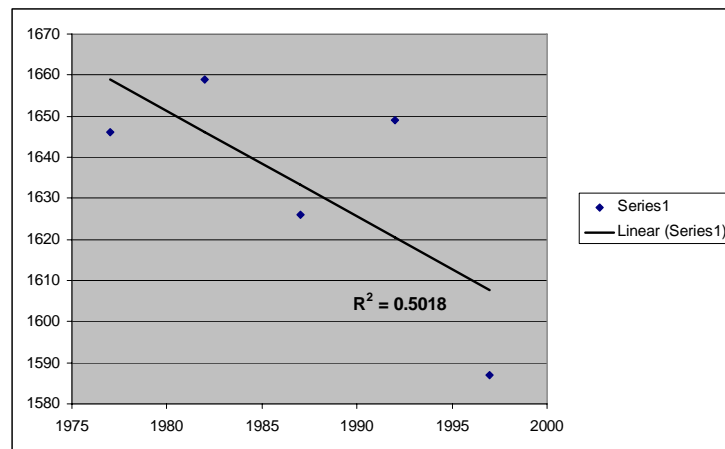
Pochard - constant source area - average recovery distance

Total population Denmark	1962	1967	1972	1977	1982	1987
average distance	876	1115	1088	731	967	687

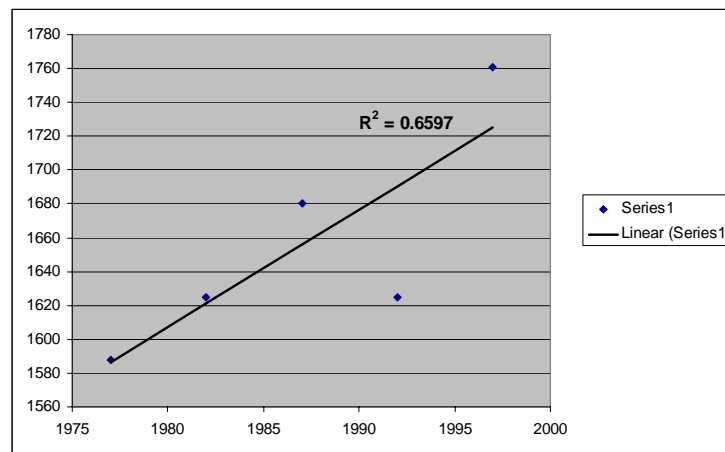


Pochard - constant source area - average recovery distance

Total population Latvia – Riga	1975-79	1980-84	1985-89	1990-94	1995-99
average distance	1646	1659	1626	1649	1587

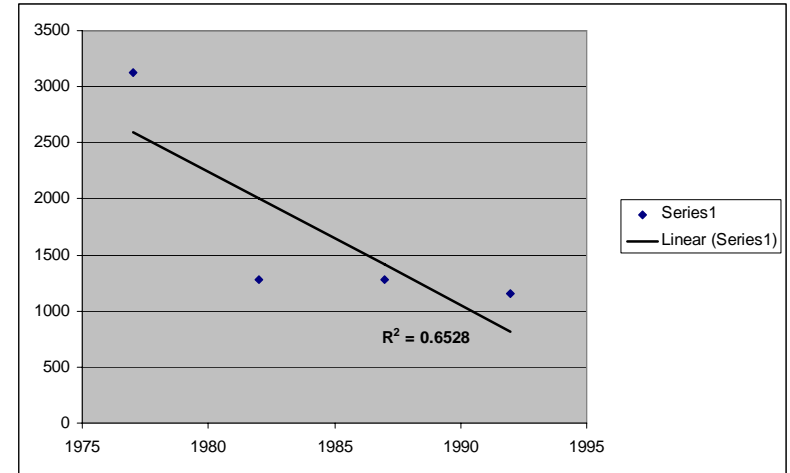


Females only Latvia – Riga	1975-79	1980-84	1985-89	1990-94	1995-99
average distance	1588	1625	1680	1625	1761

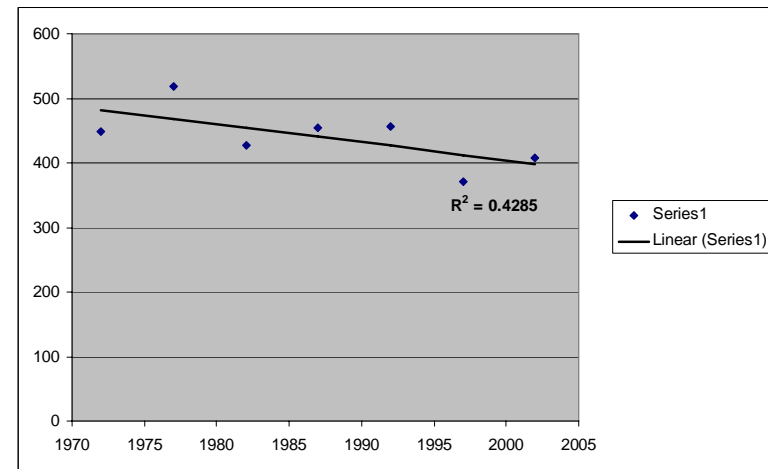


Tufted Duck - constant source area - average recovery distance

Latvia	1977	1982	1987	1992
average distance	3127	1280	1280	1152

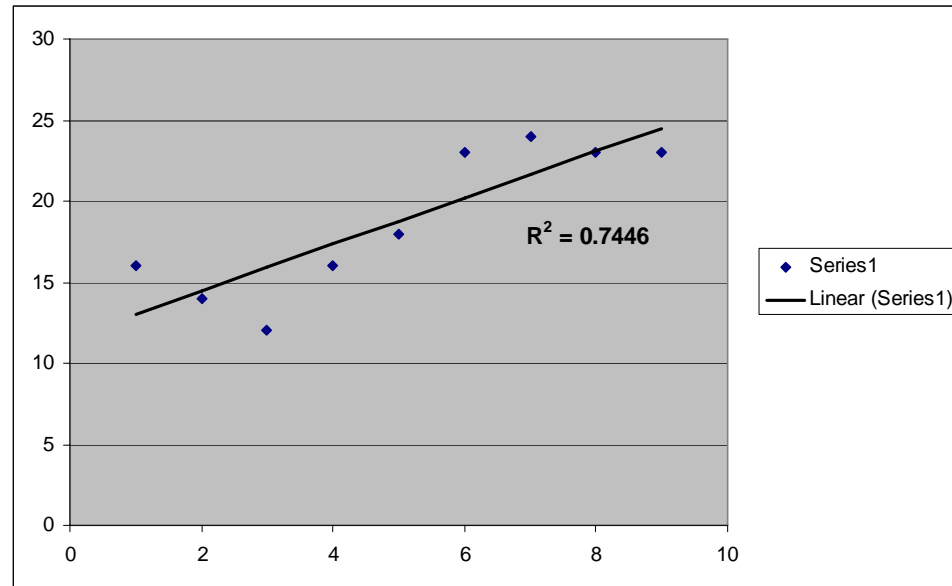


Switzerland	1972	1977	1982	1987	1992	1997	2002
average distance	449	518	427	454	457	370	407



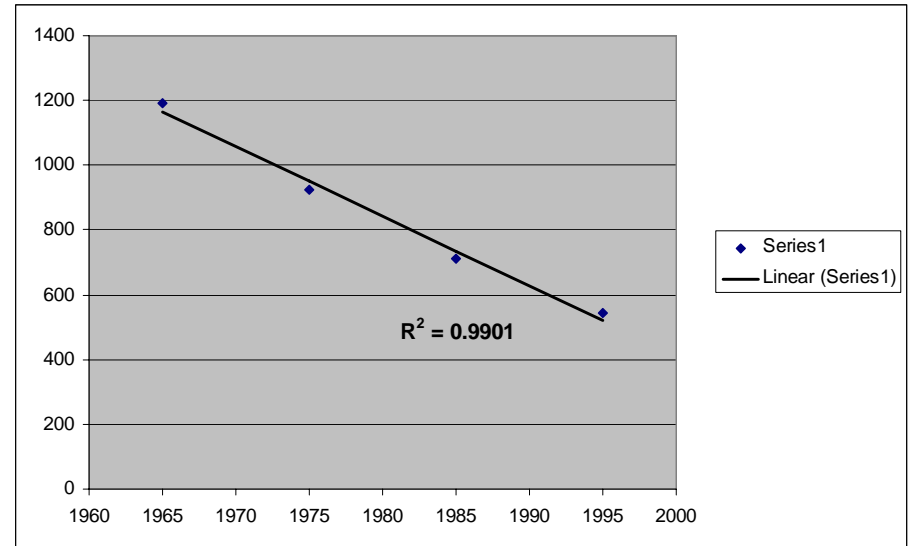
Tufted Duck - constant recovery area - % of ring recoveries

France	1962	1967	1972	1977	1982	1987	1992	1997	2002
% of 5 year recoveries	16	14	12	16	18	23	24	23	23

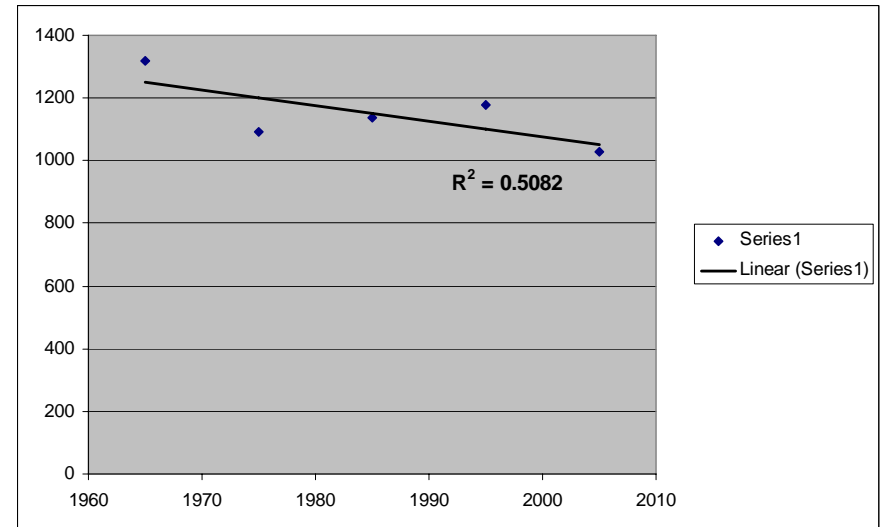


Goldeneye - constant source area - average recovery distance

Sweden - Stockholm	1965	1975	1985	1995
average distance	1190	923	713	542



Finland - Helsinki	1965	1975	1985	1995	2005
average distance	1318	1090	1139	1179	1026



Scale of change

<u>Pochard</u>	<u>Total 'relocation'</u>	<u>Annual 'movement'</u>
Denmark	-200km/25yrs	-8km/yr
Latvia	-60km/20 years	-3km/yr
females	+130km/20 years	+7.5km/yr
<u>Tufted Duck</u>		
Latvia	-180km/25 years	-7.2km/yr
Switzerland	-90km/30 years	-3km/yr
<u>Goldeneye</u>		
Sweden	-600km/30 years	-20km/yr
Finland	-200km/40 years	-5km/yr

Euring data analysis - conclusions

1. Appears not to have been previously used to analyse for migratory short-stopping.
2. Indicates some relevant trends.
3. Highlights different trends in different species and populations
4. Highlights value of ongoing ringing programmes
5. Fuller analysis required with -
 - Comprehensive datasets
 - Better data cleaning
 - More robust statistical methods
6. Scale of diving duck 'short-stopping' comparable to recent assessment of wader wintering ground movements – latter statistically a more robust study
7. Differences compared to wader shifts (diving duck results tend to be larger) may reflect habitat distribution/availability

What next for Lough Neagh?

- **SPA - Defining responsibilities under Birds Directive**
- **Keep counting the birds here and elsewhere – imperative**
- **Further ecological studies – prioritisation exercise completed – Lough Neagh Workshop 2006**
- **Review of wider geographical population datasets**
- **Assessment of other species undergoing declines e.g. Coot**
- **More detailed analysis of ringing data**
- **Remedying problem (if identifiable and if possible) may not address population issue – new patterns established**
- **Still an internationally important site + harsh weather movements**