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Integrating local knowledge in Greenland

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NERI –Arctic Environment, Aarhus University

Opening Doors to Native Knowledge, Copenhagen, Oct. 22, 2009

Outline

- Common approaches to local knowledge in Greenland
- Case studies using local knowledge to establish a baseline when prior knowledge was limited
- Case study combining local knowledge and standardized monitoring protocols
- Challenges: reliability and study species, management considerations
- Conclusions

Common approaches to local knowledge in Greenland

- Timing and logistics
  - transportation and safety issues
  - timing and whereabouts of certain species (breeding, moulting, etc.)
- Collecting samples of study species
  - reindeers, polar bears, seals, seabirds, etc.
- Historical information / Baseline information
  - previous and recent population development
  - previous and recent threats
  - past and present breeding locations, etc.
- Community-based monitoring programs
  - regular observations/sampling of certain areas or species
  - standardized survey/sampling protocol
  - often involves training of locals



Why community-based monitoring programs?

- Limited resources available at GINR and NERI for monitoring purposes
- Logistical costs reduced significantly
- Timing of surveys more flexible
- Important events may happen outside the breeding season

- Unique opportunity to build capacity and trust between management agencies and local users
- Higher awareness local population development
- Facilitate local responsibility of sustainable use
- Formal agreement of co-operation between the hunters organization (KNAPK) and GINR

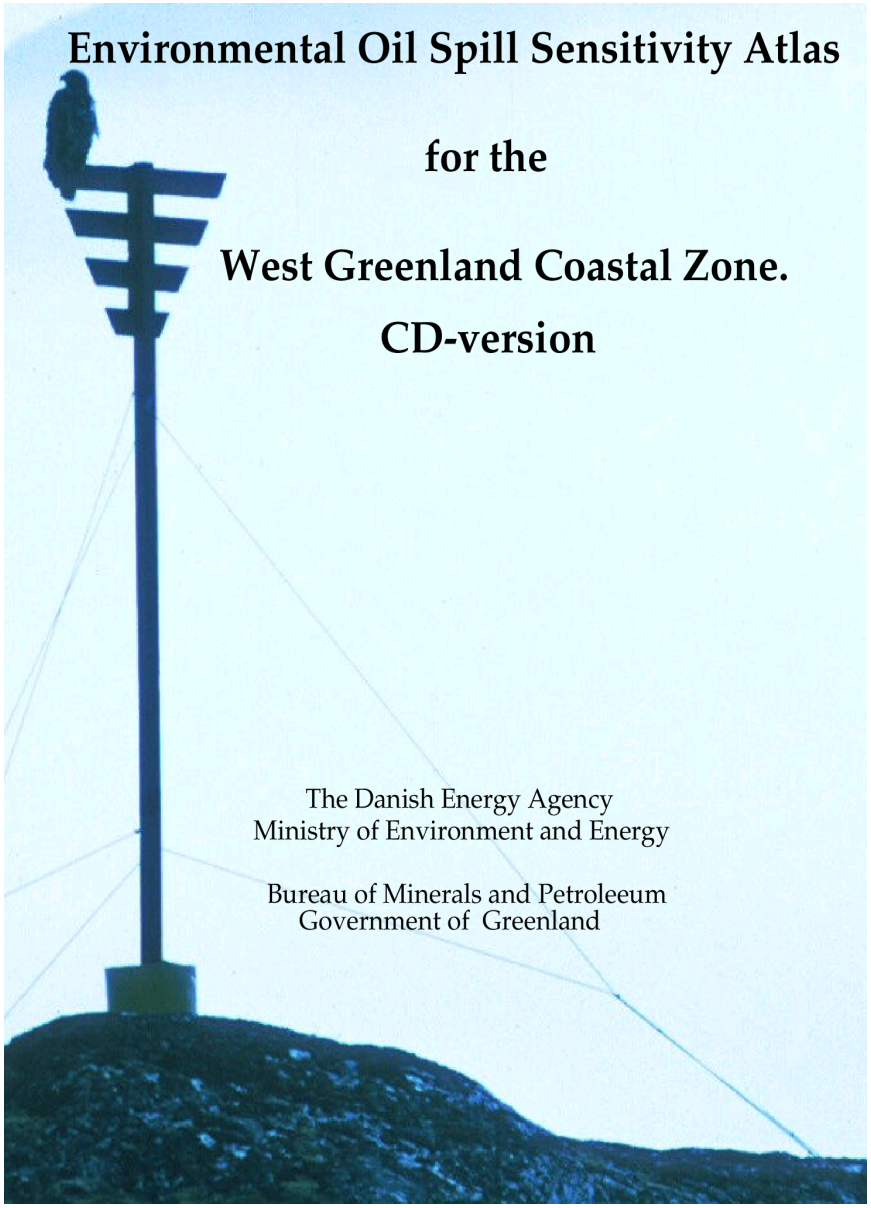


Environmental Oil Spill Sensitivity Atlas

for the

West Greenland Coastal Zone.

CD-version



The Danish Energy Agency
Ministry of Environment and Energy

Bureau of Minerals and Petroleeum
Government of Greenland

Legends

Shoreline Sensitivty Maps

Shoreline Species


Al Alcids

Ar Arctic char

Ca Capelin


Co Cormorants


De Deep sea shrimps


Gu Gulls

Ha Harbour seals

Lu Lumpsuckers


Sb Seaducks breeding


Sc Scallops

Se Seaducks


Sn Snow crabs


Tu Tubenoses

Site Specific Shoreline Species


Al Alcids


Co Cormorants


Gu Gulls

Ha Harbour seals


Sb Seaducks breeding

Se Seaducks


Tu Tubenoses

Shoreline Resource Use


R Resource use (Human use)


Archaeological site

Shoreline Areas Sensivity Ranking


Extreme (> 45)


High (33 - 45)


Moderate (22 - 33)


Low (< 22)

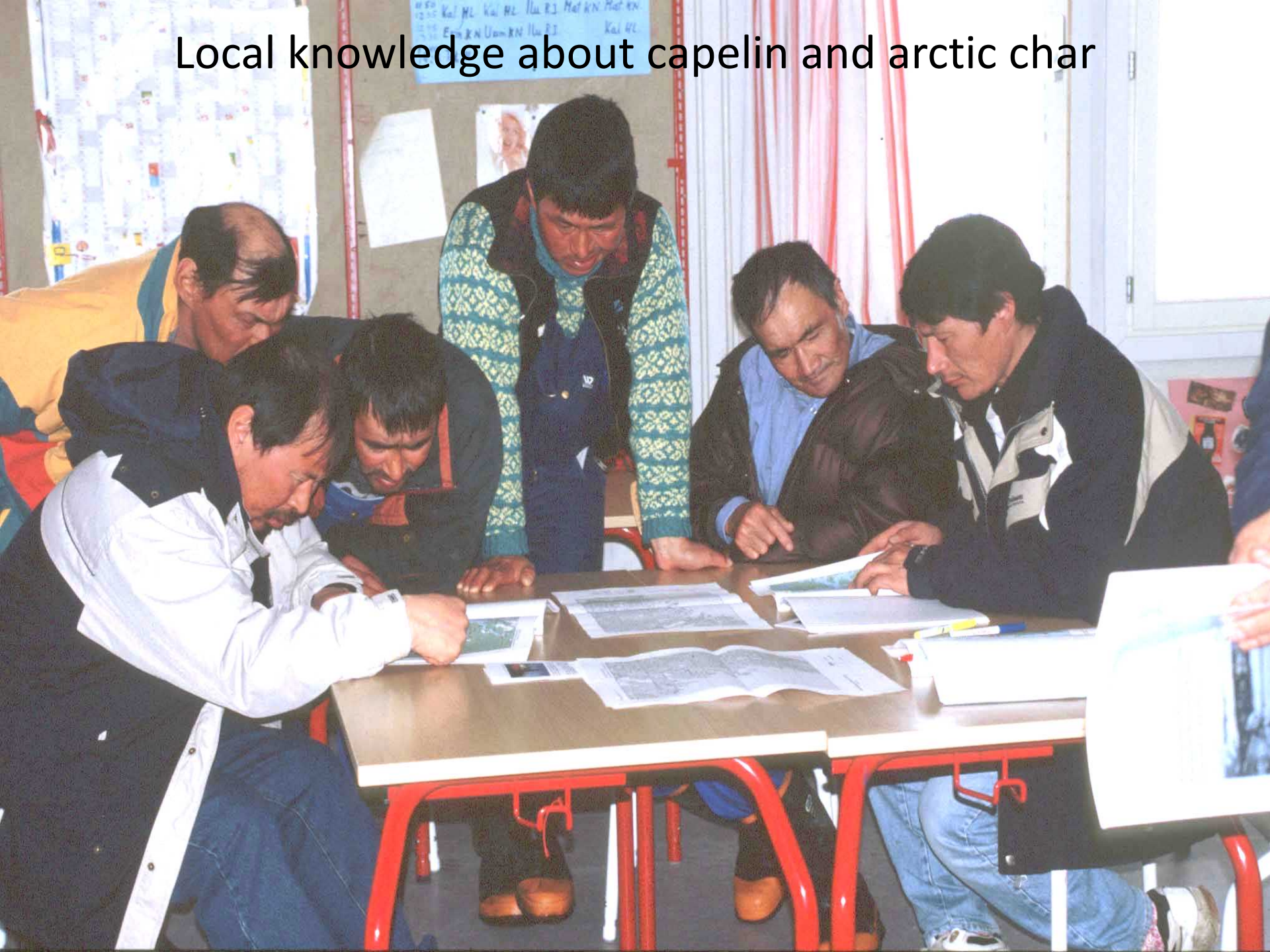
Selected Areas


S Selected area

Mapscale 1:250.000
Projection: UTM, zone 22N, WGS84

Maps produced by National Environmental Research Institute (NERI) and Geological Survey of Denmark and Greenland (GEUS), March 2000

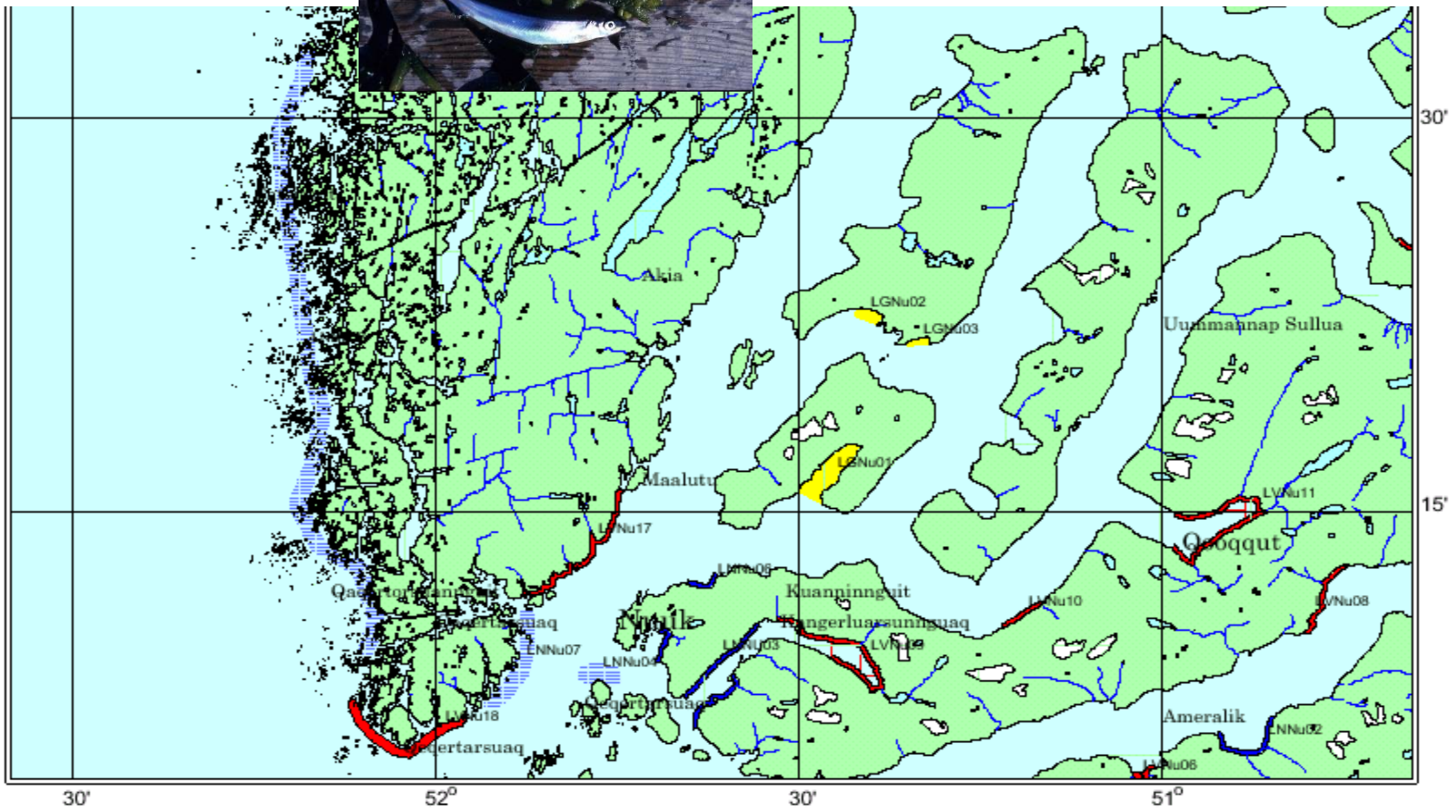
Local knowledge about capelin and arctic char

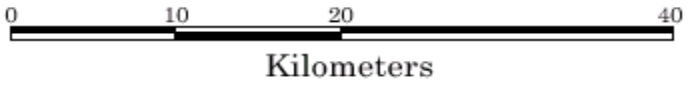


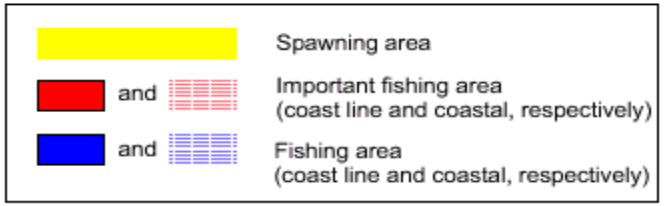
Capelin



Nielsen et al., 2000 (NERI Tech. Rep. 118+119)



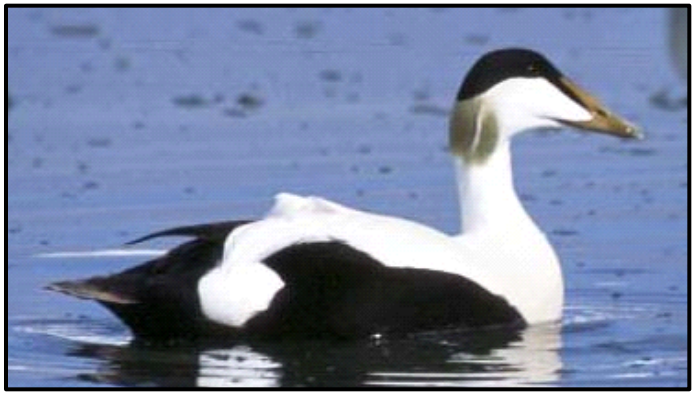




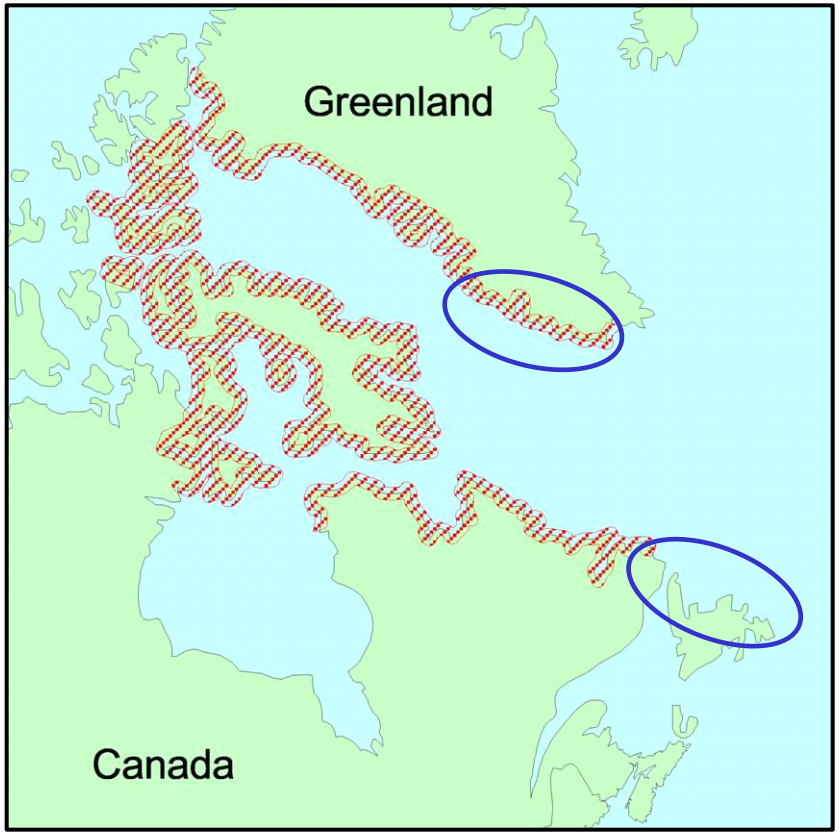

G. Gilchrist

Northern Common Eider

Somateria mollissima borealis





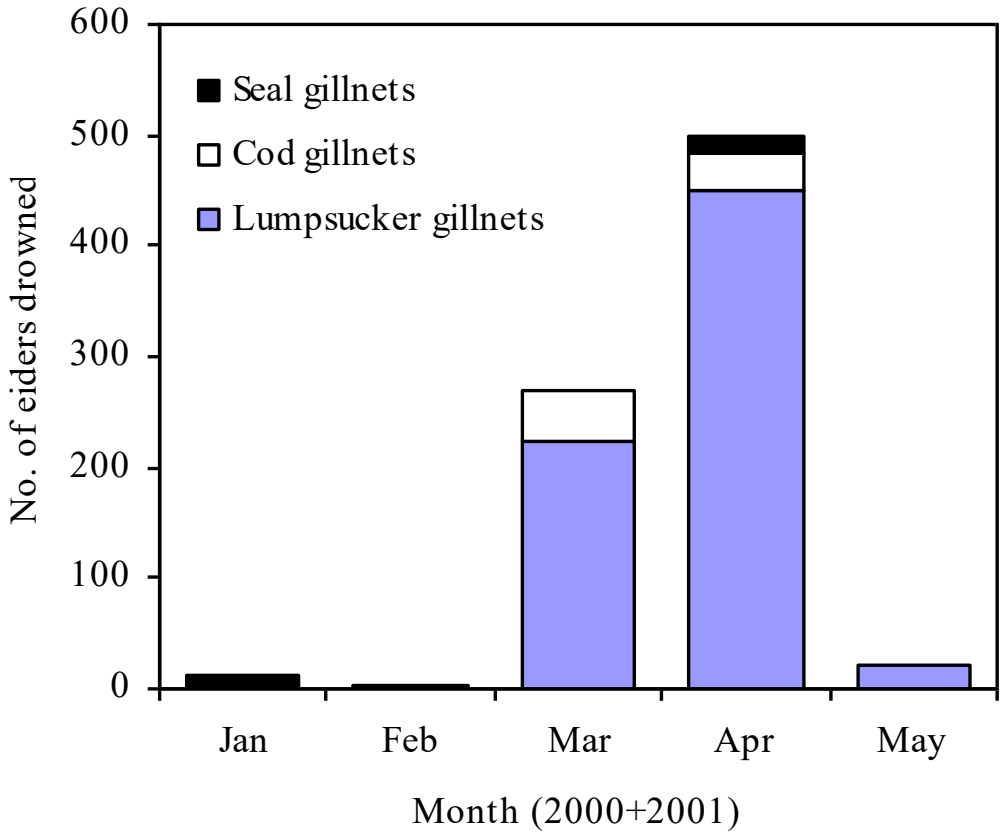




C. Egevang/arc-pic.com



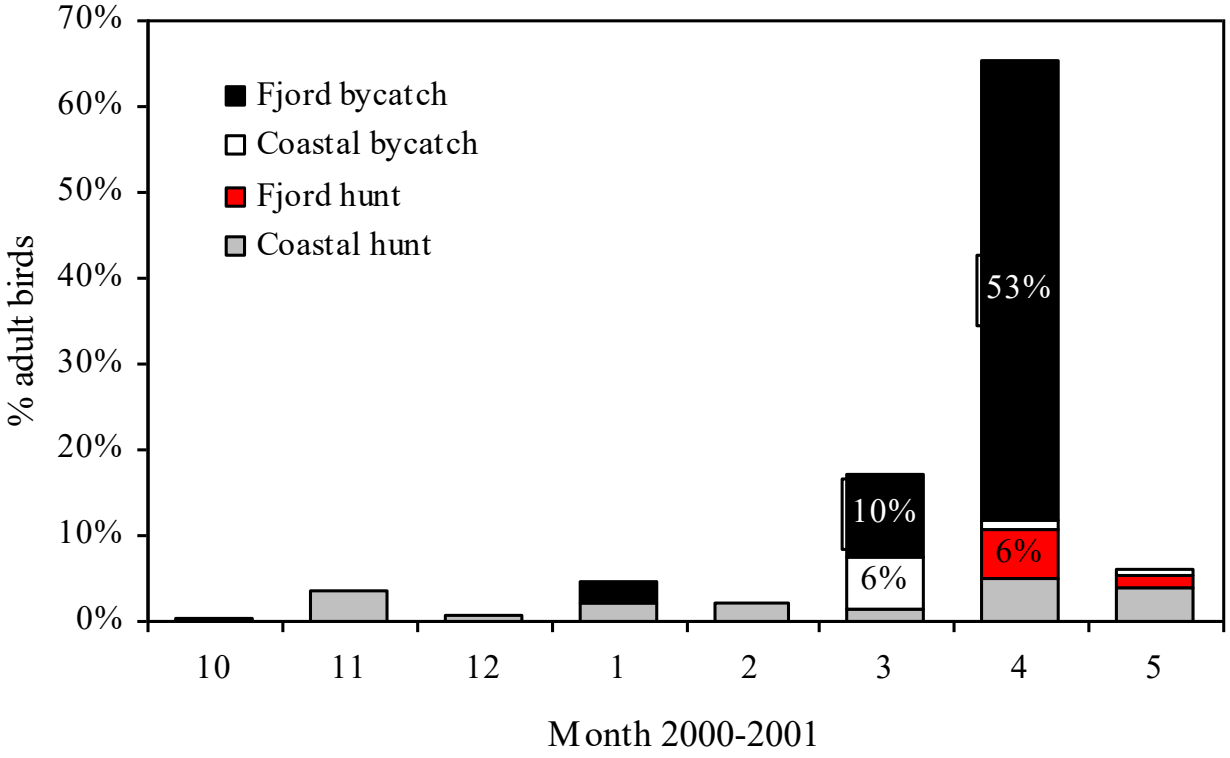
Bycatch of eiders (Nuuk)



Merkel 2004 (Waterbirds)



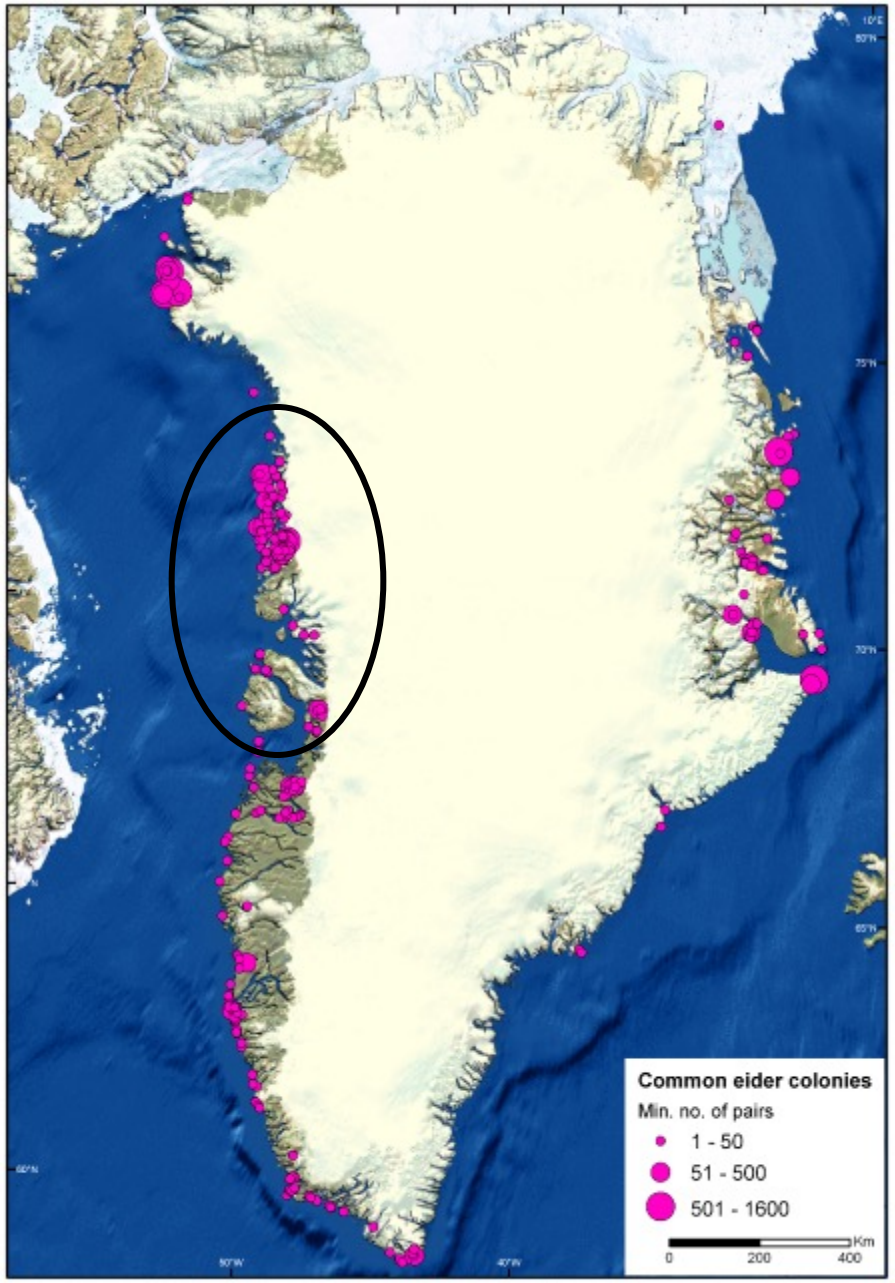
Bycatch of eiders (Nuuk)



Merkel 2004 (Waterbirds)

Common eider study area 1998-2001

- Indications of large declines
- Some colony surveyed in the 1960'ties

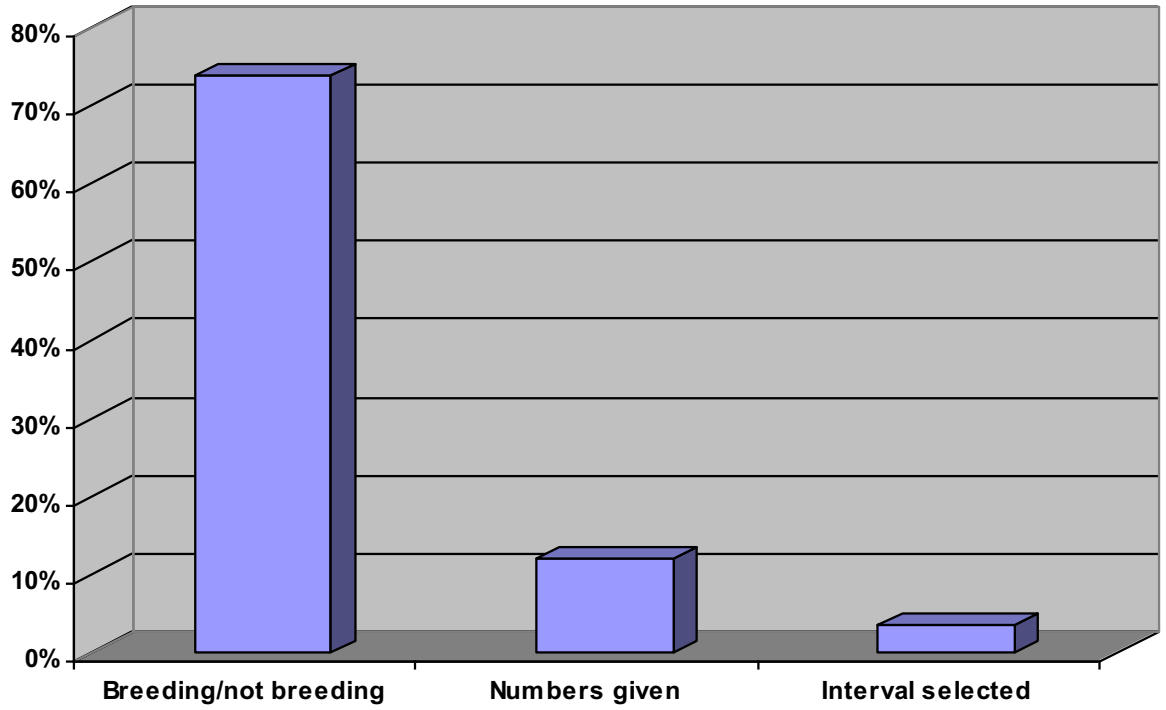


Interviews



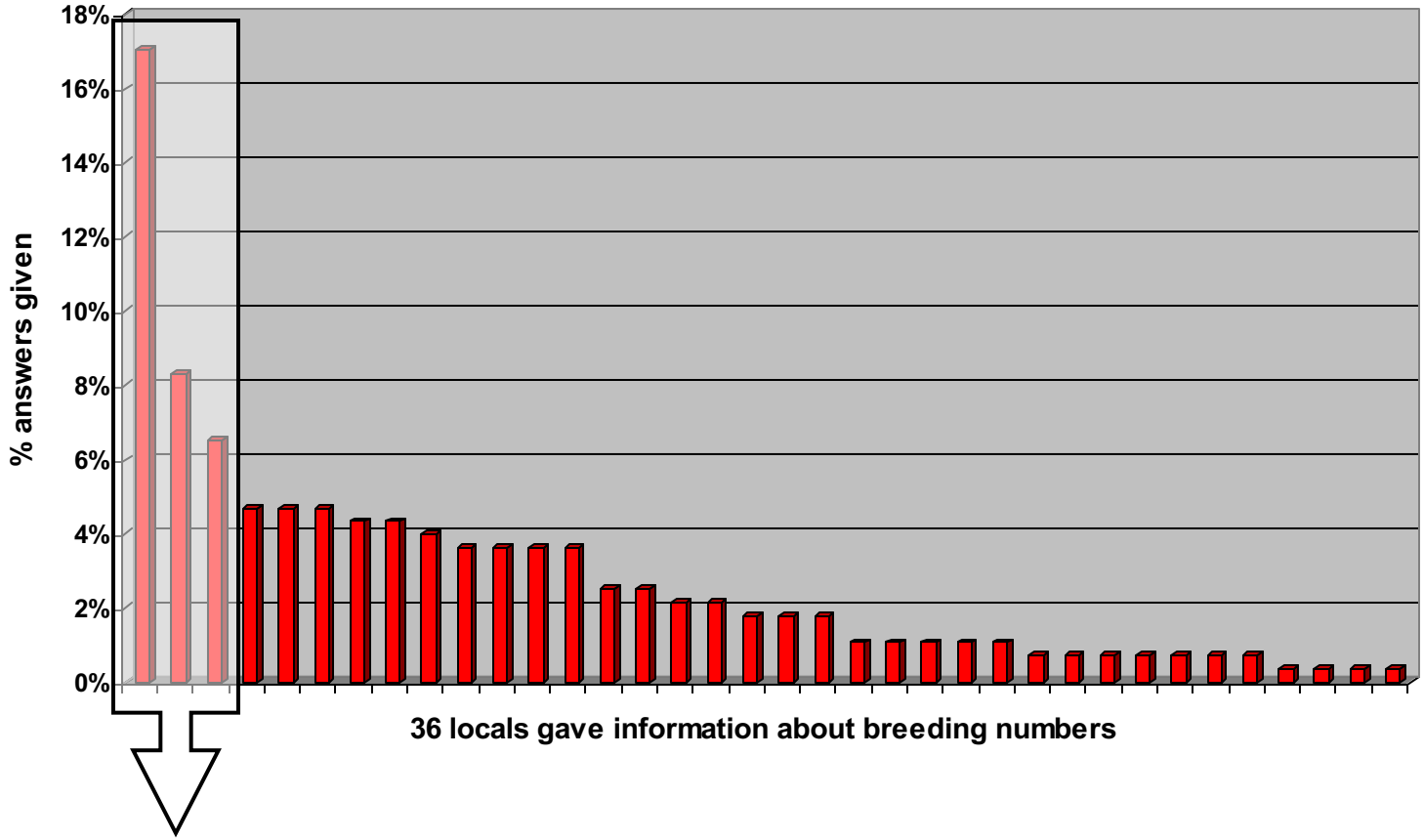
Quantification by local users

(47 persons each gave information about ~50 colonies)



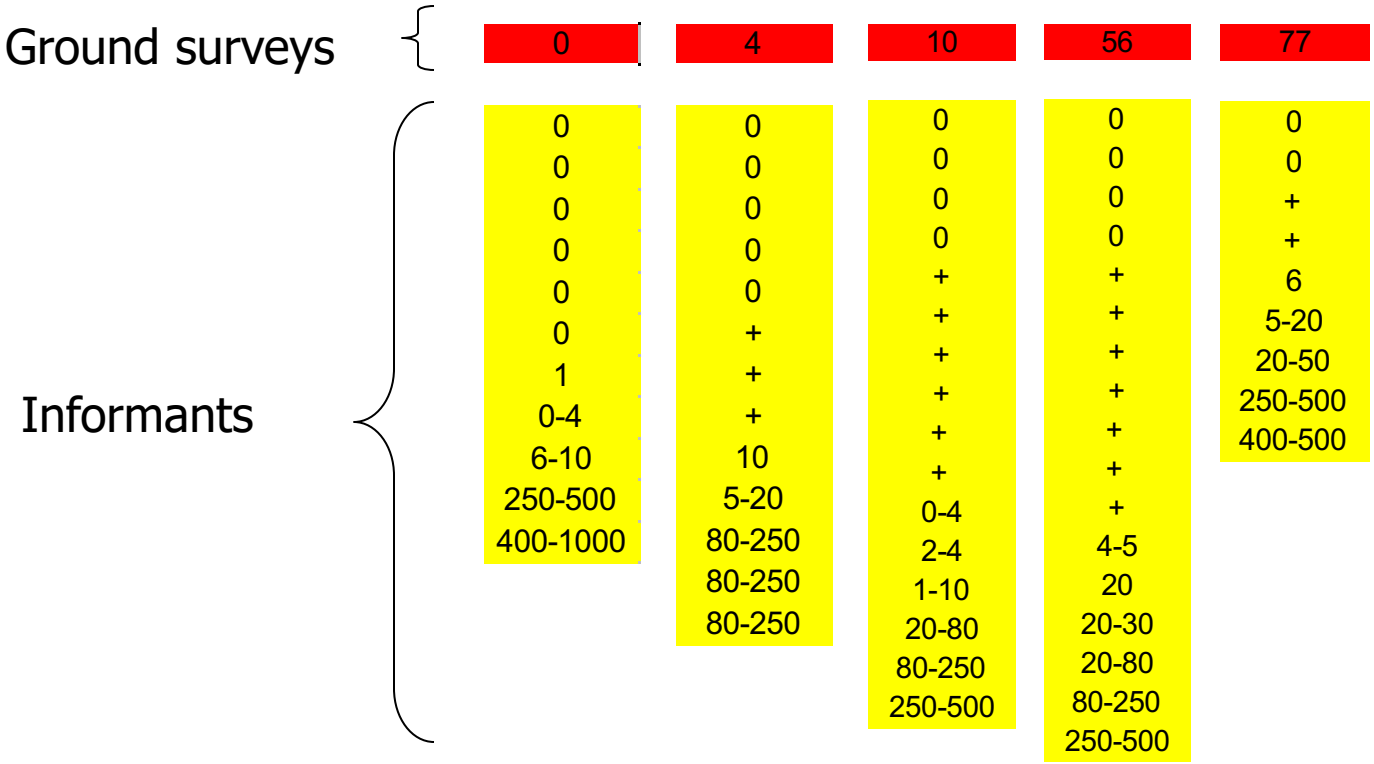
Quantifying breeding numbers

(N = 276 reference colonies)



3 persons gave 32% of the answers

Quantifying breeding numbers – colony examples



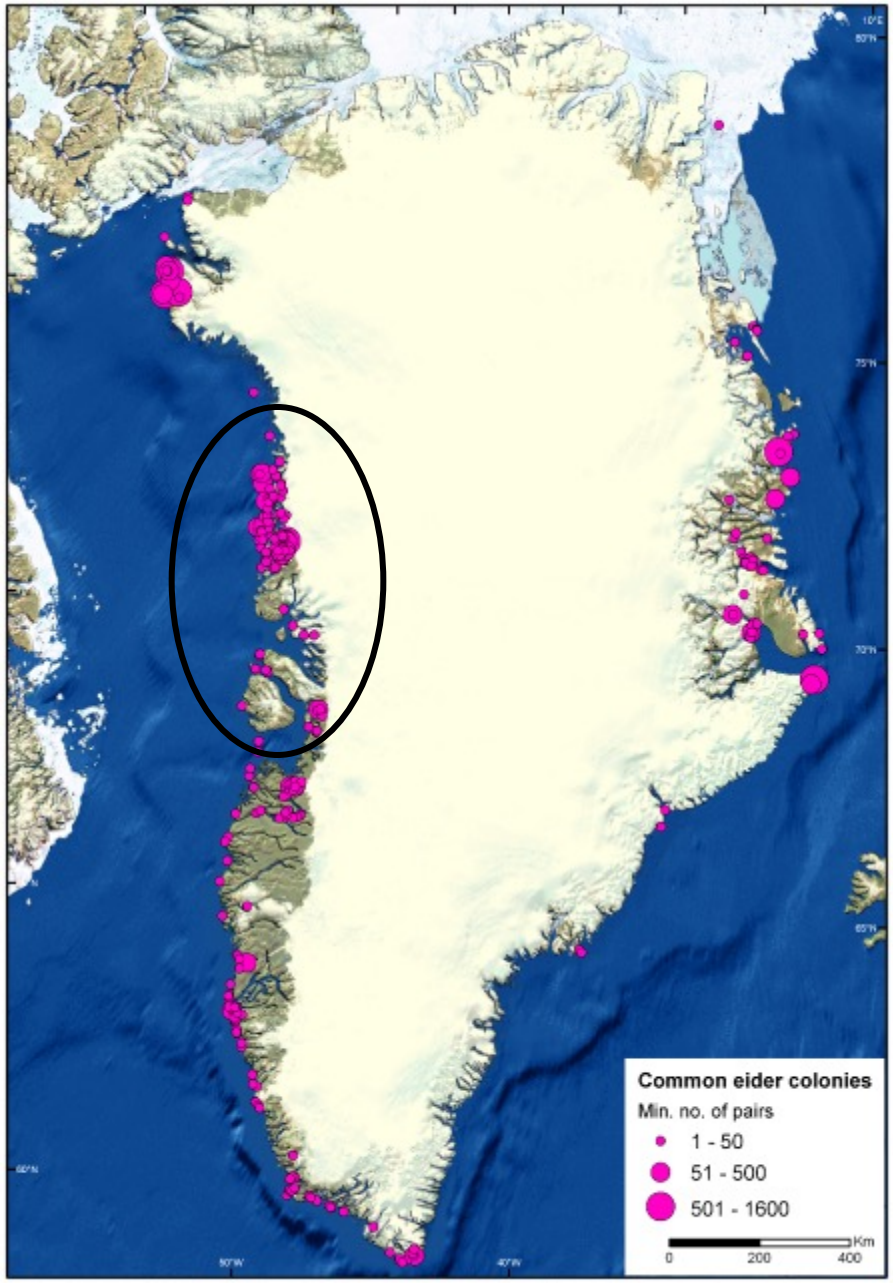
Population decline

- Evidence of a 80% population decline for common eiders 1960-2000

  (Merkel 2004, Arctic)

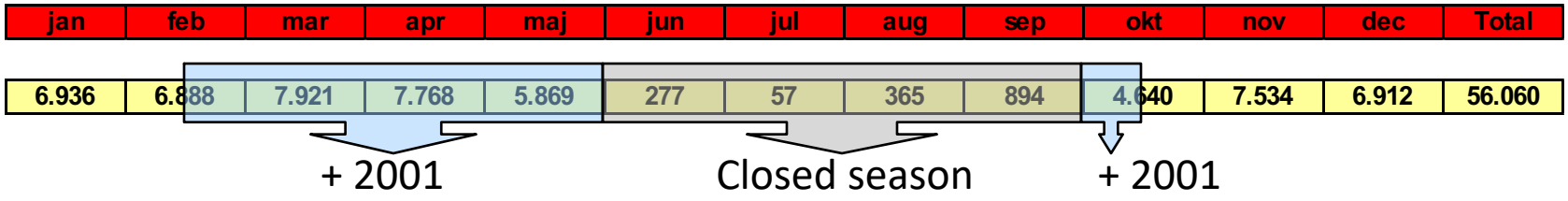
- Decline probably linked to unsustainable harvest

- Other species of seabirds were declining

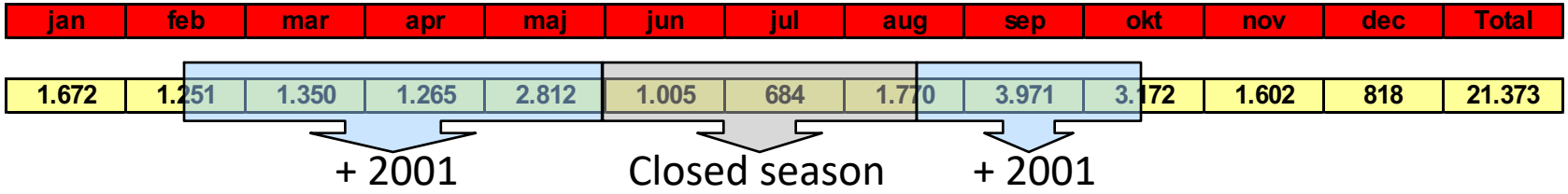


Hunting regulations changed in 2001

Southwest Greenland*



Rest of Greenland*

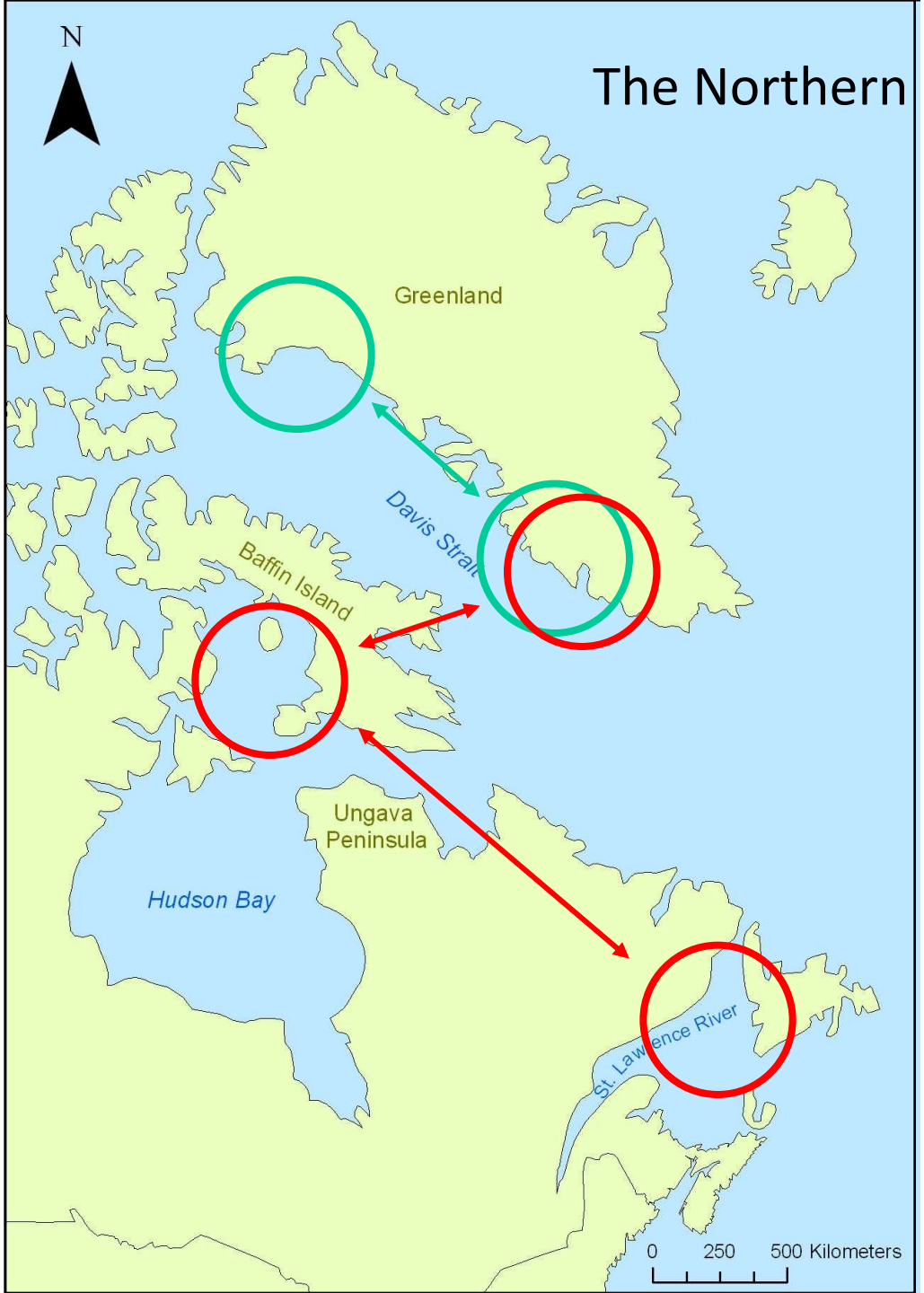


Sum = **39.816 eiders – both species**

-A major change for Greenland hunters
-Would colonies show signs of recovery?

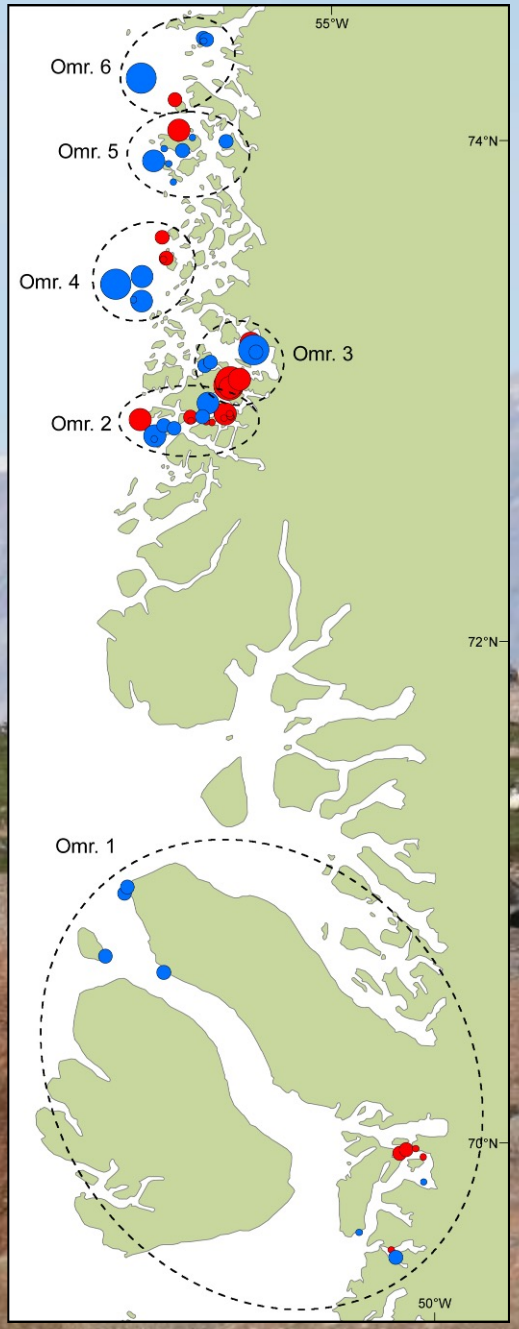
*harvest based on 1993-99 statistics

The Northern Common Eider

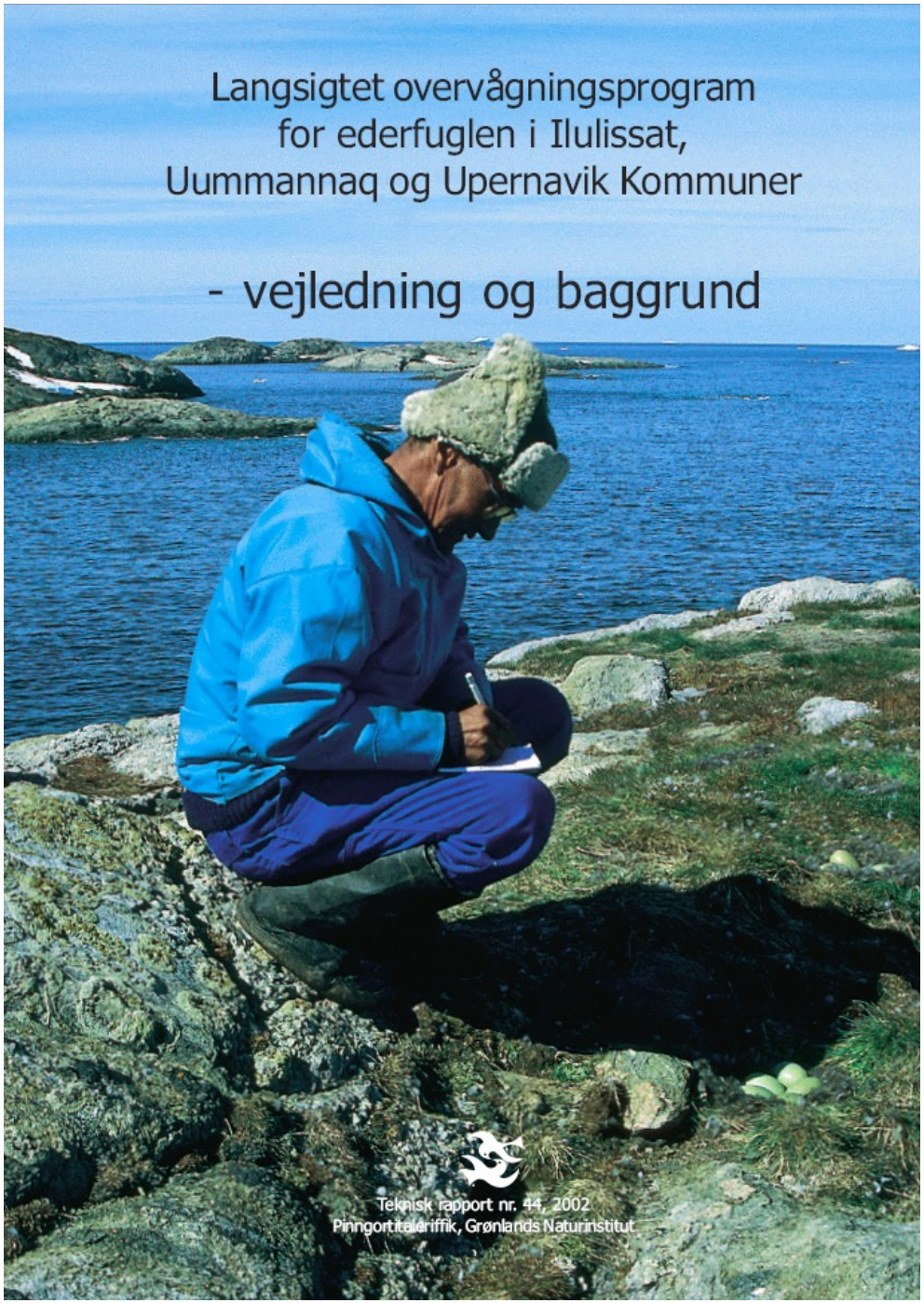


A community-based monitoring program

- Started in 2001
  - locals trained in the nest counting technique
- 32 colonies included, surveyed annually
- Plus 25 reference colonies, surveyed by GINR app. every 5 years



The survey manual



The survey manual

ikke har lagt sit første æg; den kan stamme fra en ynglefugl, som af en eller anden grund har afbrudt sit yngleforsøg b) eller den kan være resultatet af, at en ynglefugl har afprøvet flere redeskåle, inden den har "besluttet" sig endeligt for redens placering.



Figur 4.3. Kategori 3 - rede med plantedele og æg (uden dun).

3. Reder med plantedele og æg (uden dun), figur 4.3.
Disse reder kan ikke forveksles med nogen af de andre redekategorier. Rederne har ingen dun, blot lidt plantedele og nogle få æg – typisk et eller to. Grunden til at en sådan rede endnu ikke indeholder dun er, at ynglefuglen befinder sig i starten af æglægningsperioden. Fuglen begynder normalt først at fore reden efter det tredje eller fjerde æg er lagt.



Figur 4.4. Kategori 4 - tom dunrede.

4. Tomme dunreder, figur 4.4.
Denne kategori repræsenterer reder, hvor æggene er blevet fjernet (af f.eks. måger, ræve eller mennesker). Grunden til at man kan vide, at rederne tidligere på sæsonen har indeholdt æg, er som tidligere nævnt, at ederfuglene først begynder at lægge dun i rederne, efter de første 3-4 æg er lagt. Rederne indeholder oftest mange dun, og det er som regel tydeligt, at det er friske dun fra samme år. Nogle gange ligger dunene ved siden af reden, fordi vinden har blæst dem ud af redeskålen. Kategori 4 reder skelnes oftest meget let fra kategori 7 reder, jævnfør nedenstående.



Figur 4.5. Kategori 5 - dunrede med æg.

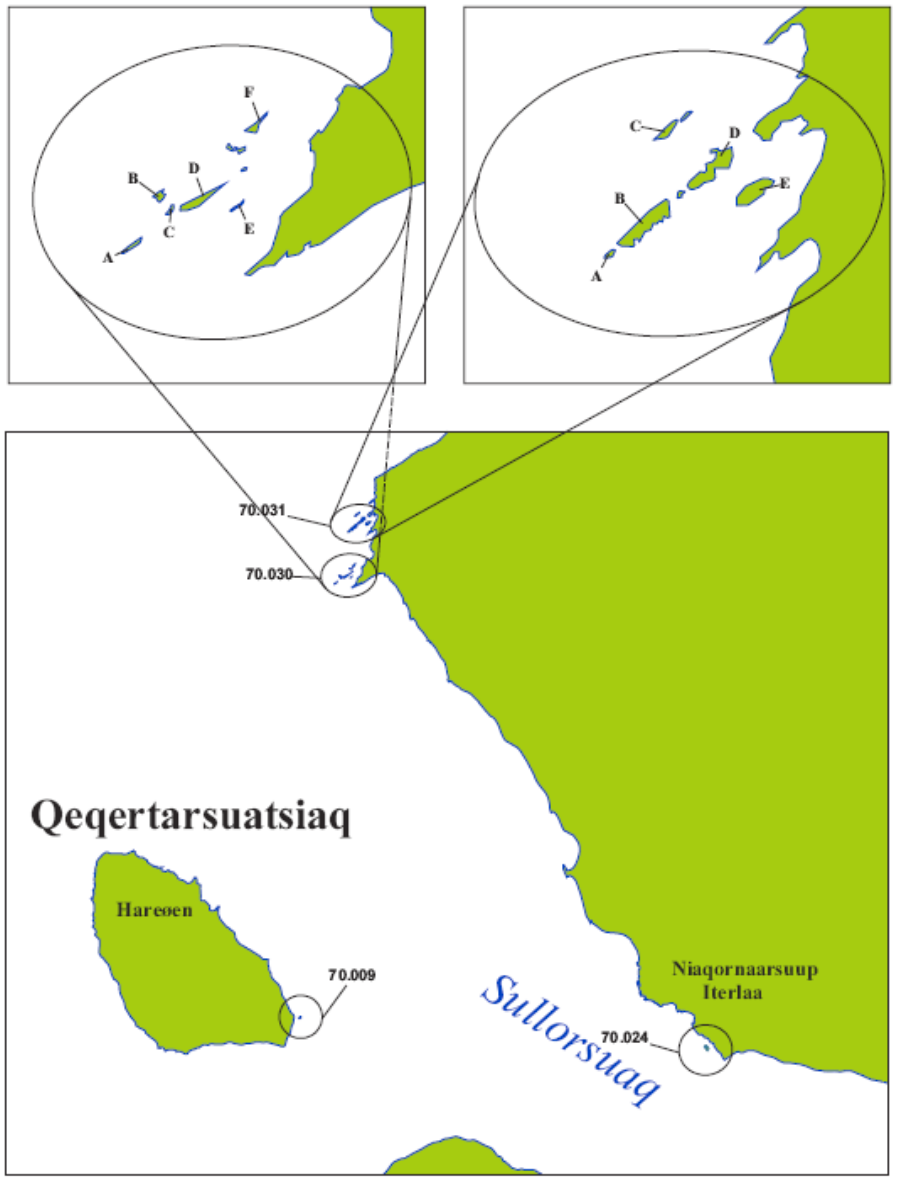
5. Dunreder med æg, figur 4.5.
Denne kategori kræver ikke nærmere forklaring. Rederne kan ikke forveksles med nogen af de andre redekategorier. Som regel er det den slags reder, man finder flest af i ederfuglekolonierne.



Figur 4.6. Kategori 6 - rede med unger og æg.

6. Reder med unger (og evt. endnu ikke klækkede æg), figur 4.6.
Reder med en eller flere unger. Hvis altså blot ét af æggene i en rede er klækket, registreres reden under kategori 6 – ikke 5.

The survey manual



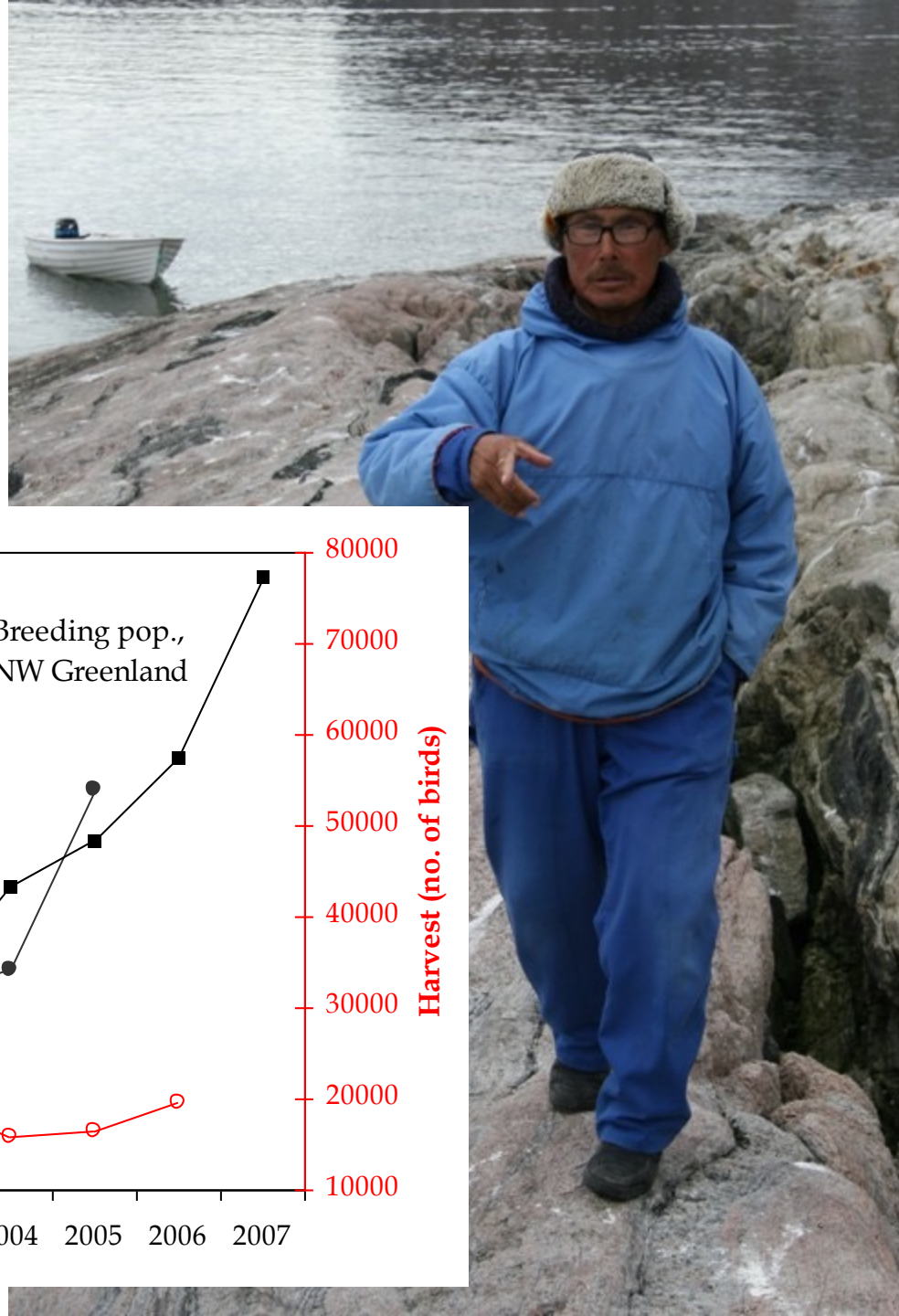
Figur 5.3. Udsnit af område 1 (Sullorsuaq) med detailoplysninger om ederfuglekolonierne 70.024, 70.009, 70.030 og 70.031. Små øer uden "bogstav-henvisning" er golde skær, som regnes for uegnet som yngle-område.

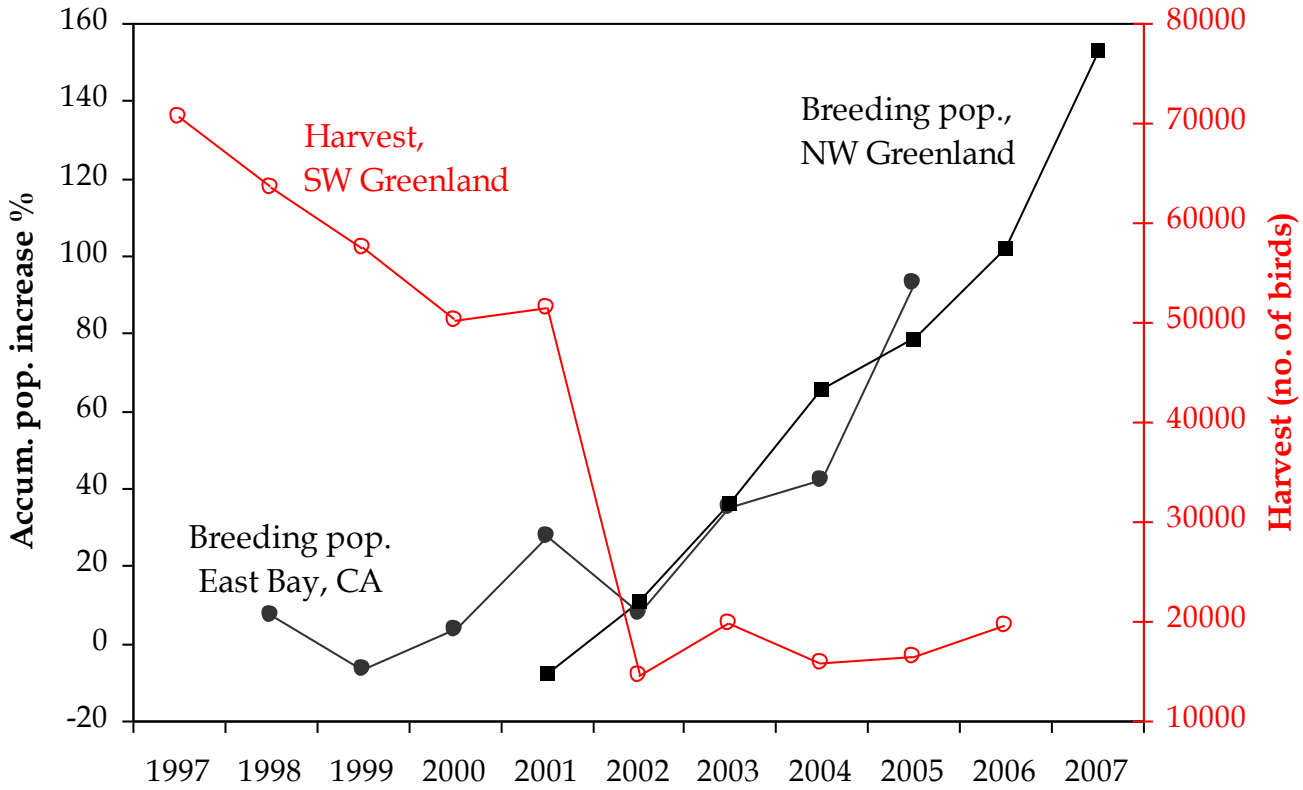
The survey manual

Navn og adresse: *Knud Grim og Aron Grim, Kangersuarsiaq*	Dato: *10-7-2005*	Start: *10:30* Slut: *10:55*	Koloninr.: *72129*	Ø-kode: *B*
2) Reder med plantedele (sammenpressede, har været lagt på for nylig)	*III = 3 reder i alt*			
3) Reder med plantedele og æg (uden dun).	*1 - 1 - 2 - 1 - 2 - 3 - 1 - 1 = 8 reder i alt* én rede med 1 æg osv.			
4) Tomme dunreder	*𝍸 II = 7 reder i alt*			
5) Dunreder med æg	*3 - 3 - 1 - 2 - 5 - 6 - 2 - 1 - 4 - 7 - 3 - 2 - 4 - 5 - 1 - 2 - 1 = 17 reder i alt* en dunrede med 3 æg osv.			
6) Reder med unger (ikke-klækkede æg noteres også - 2 unger og 2 æg noteres som 2/2)	*1/3 - 1/4 - 2/2 - 4 - 3 - 3/1 = 6 reder i alt* en rede med 4 unger en rede med 1 unge og 3 æg			
7) reder forladte af ungerne (æggeskaller og hvide hinder tilbage i reden)	*𝍸 I = 6 reder i alt*			
8) Æg spist af måger	*𝍸 III = 8 æg spist af måger*			
Bemærkninger	*Ovenstående er blot et tænkt eksempel*			

Figur 4.10. Registreringsskema til brug under optællingerne i de enkelte kolonier/øer. Skemaet er her udfyldt med et tænkt eksempel for at vise hvordan de forskellige redekategorier skal noteres. Se desuden afsnit 4.4.

Population development: 8 years later



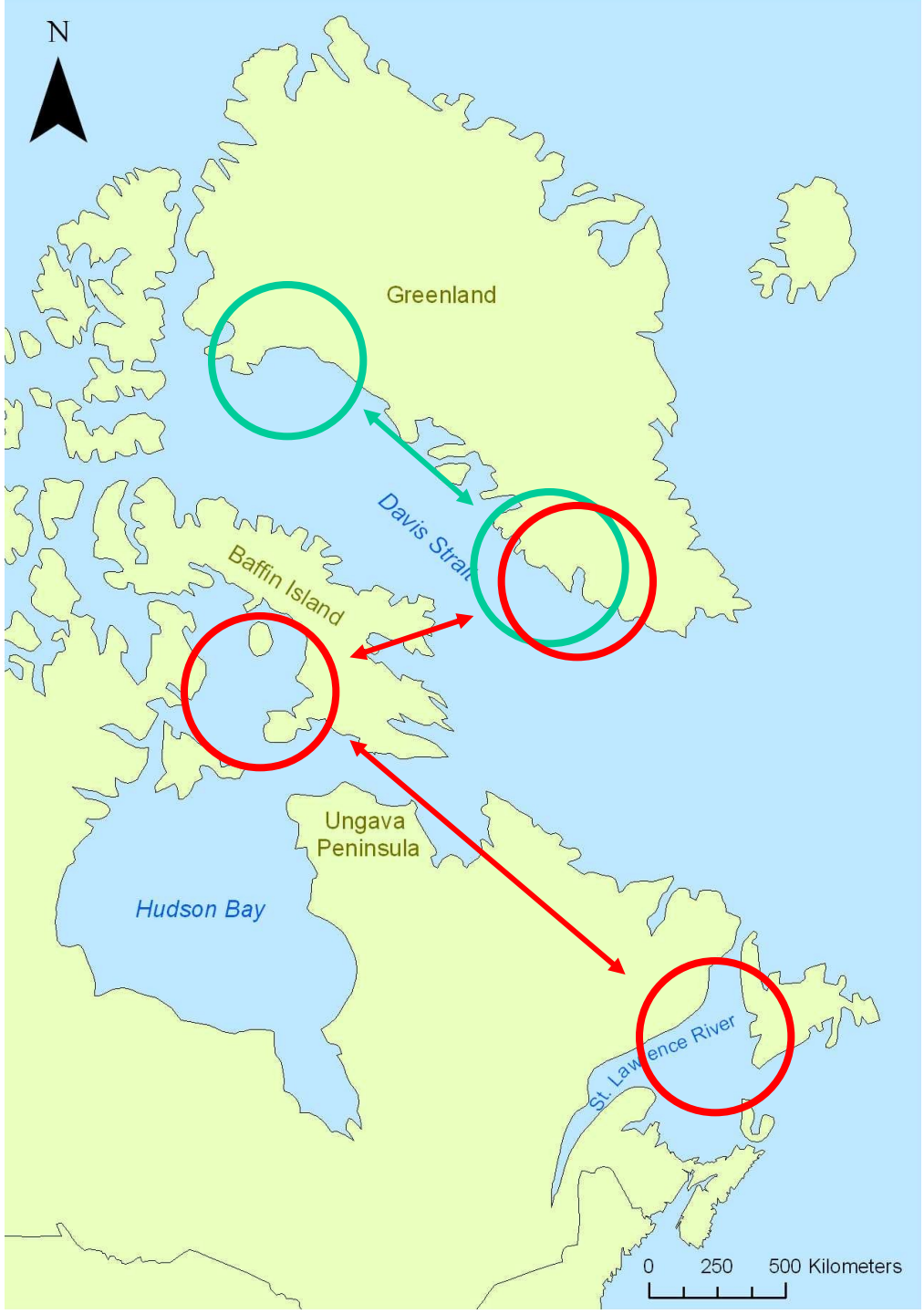


Avian cholera



Harvest regulation changed again in 2008

- More eider harvest in NW-Greenland allowed
- However, a request for reopening late winter and spring hunting in SW-Greenland was avoided



Comparison of local knowledge across species

- Common eiders (Belcher Islands)
- Harlequin duck (Baffin Island)
- Ivory gull (Baffin Island)
- Thick-billed murres (Upernavik)



Gilchrist et al., 2004, Ecology and Society

Comparison of local knowledge across species

Table 1. Summary of LEK information provided in relation to degree of community contact with a species.

Case study	Degree of community contact with species	Occurrence of species	Relationship with species	Accuracy of LEK information[a]
Common Eider Duck	very high	common	harvested year round	very high
Harlequin Duck	very low	rare	not harvested	moderate
Ivory Gull	low	rare	not harvested	high
Thick-billed Murre	high	common	harvested seasonally	low

[a] Categories: very high, correct information on population trend, distribution, and ecological information explaining trends; high, correct information on population trend and distribution of a species; moderate, correct information on geographic distribution of species; low, incorrect information on population trend and/or distribution.

Gilchrist et al., 2004, Ecology and Society

Conclusions regarding local knowledge

- Essential for study planning: timing and logistics
- Often useful in describing distribution of species, long-term population trends or large sudden changes
- Rarely accurate in quantifying population sizes
- Rarely capable of identifying causes of decline (especially for migratory species)
- Management based solely on local knowledge is not recommended for migratory species
- Combining efforts through community-based monitoring programs carry large potentials (although species and methods should be carefully selected)

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Questions?