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Managing an overabundant population: the Greater Snow Goose in North America



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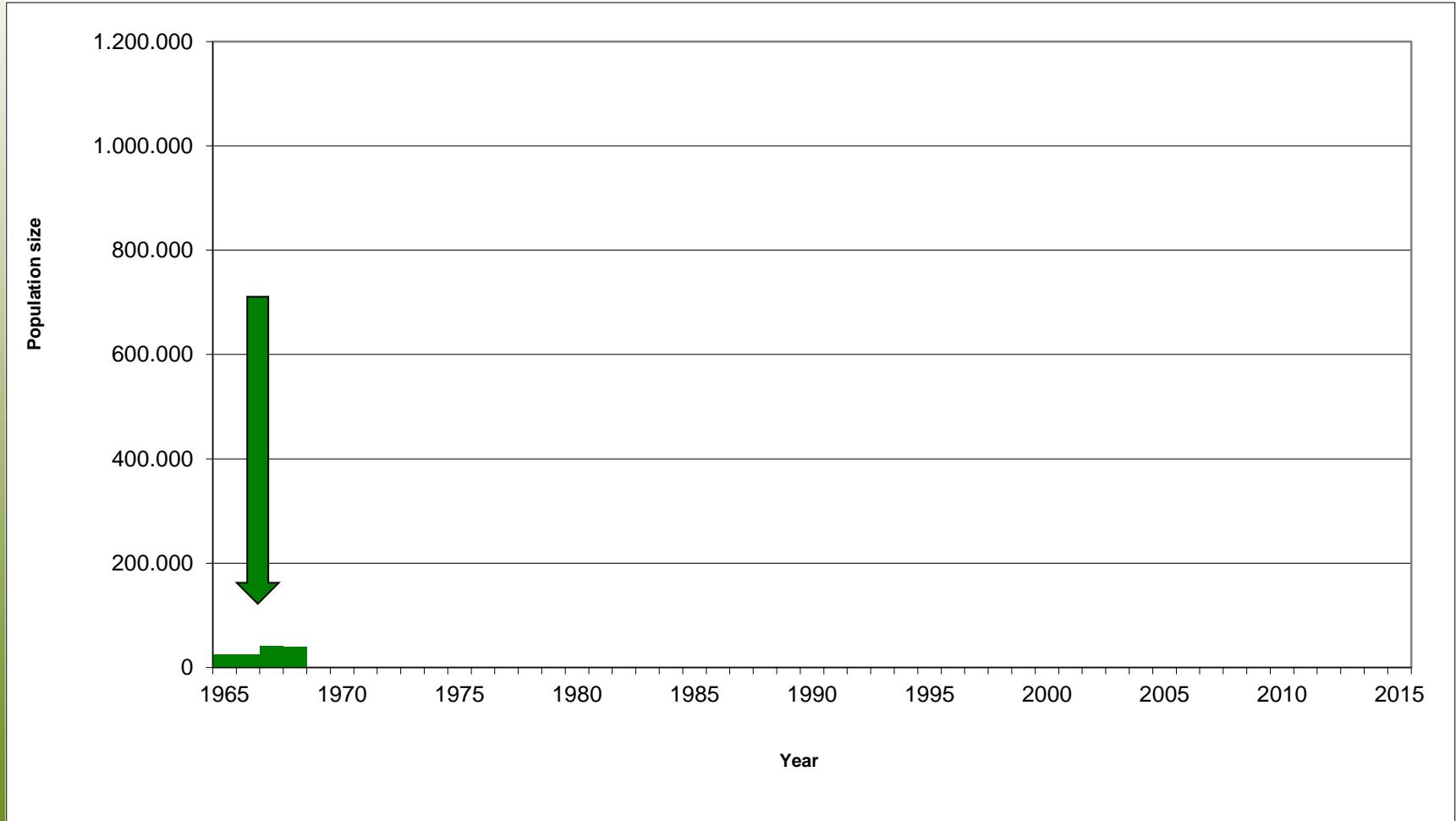
Greater Snow Goose distribution



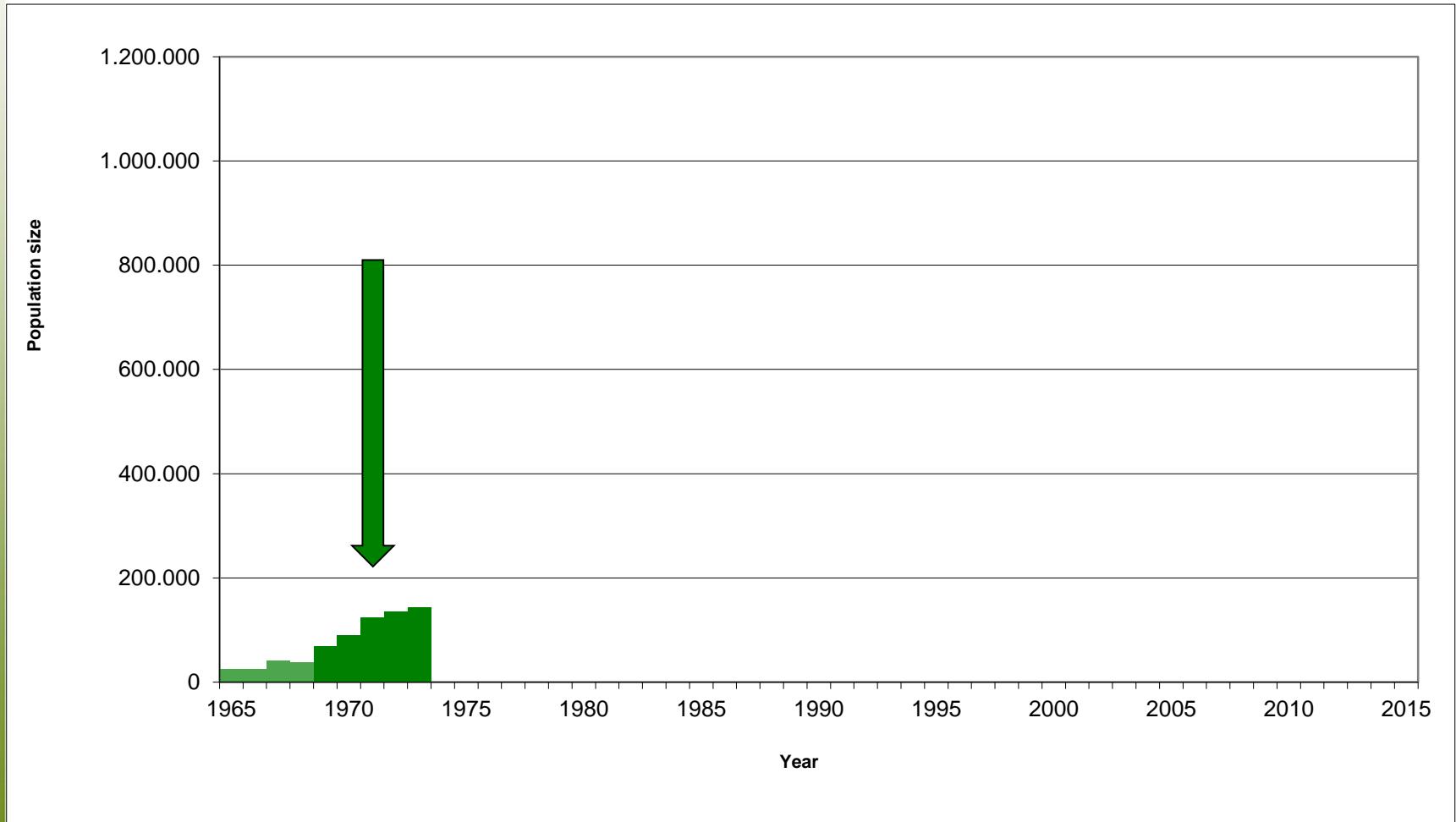
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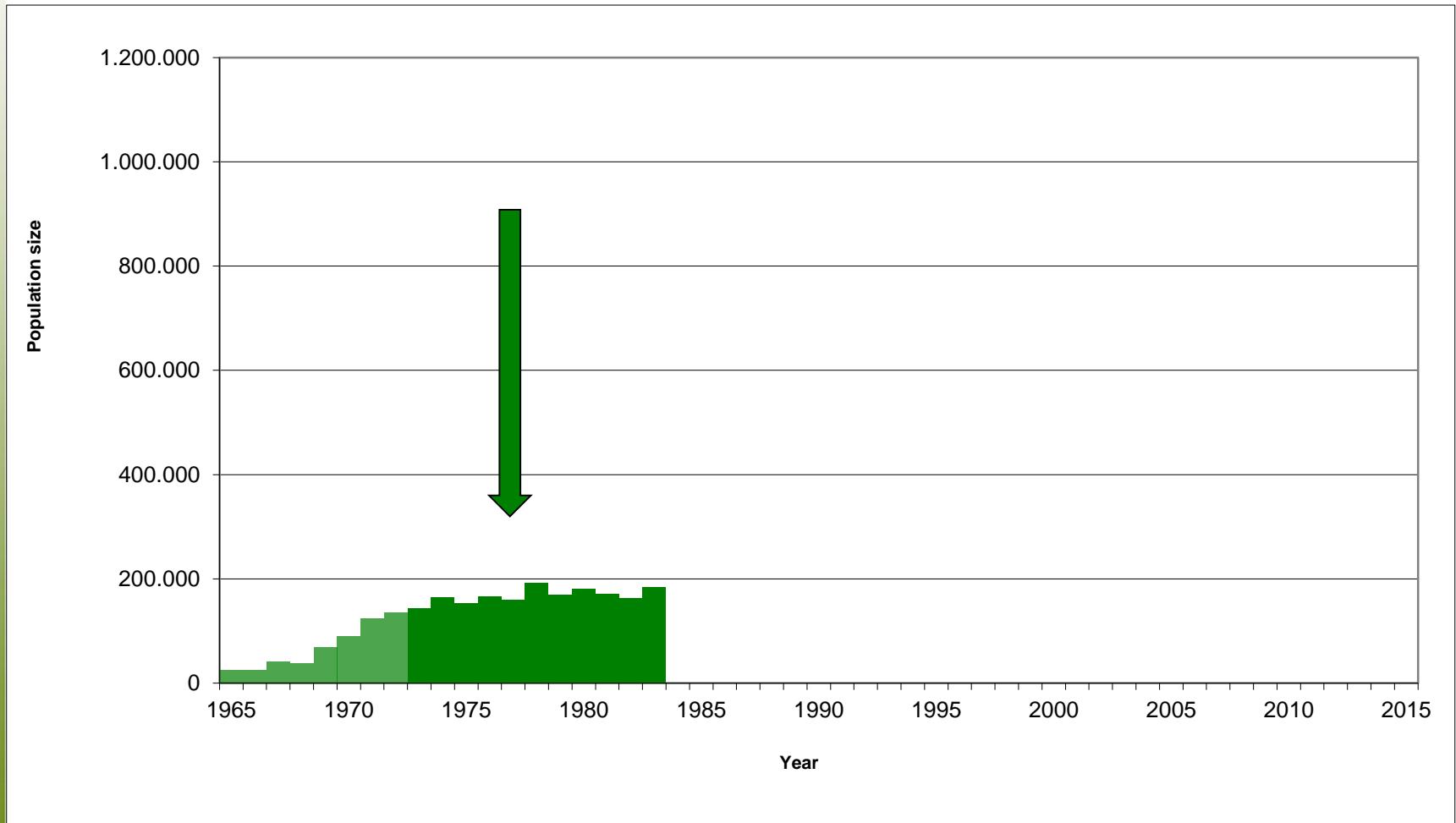
History of the population size



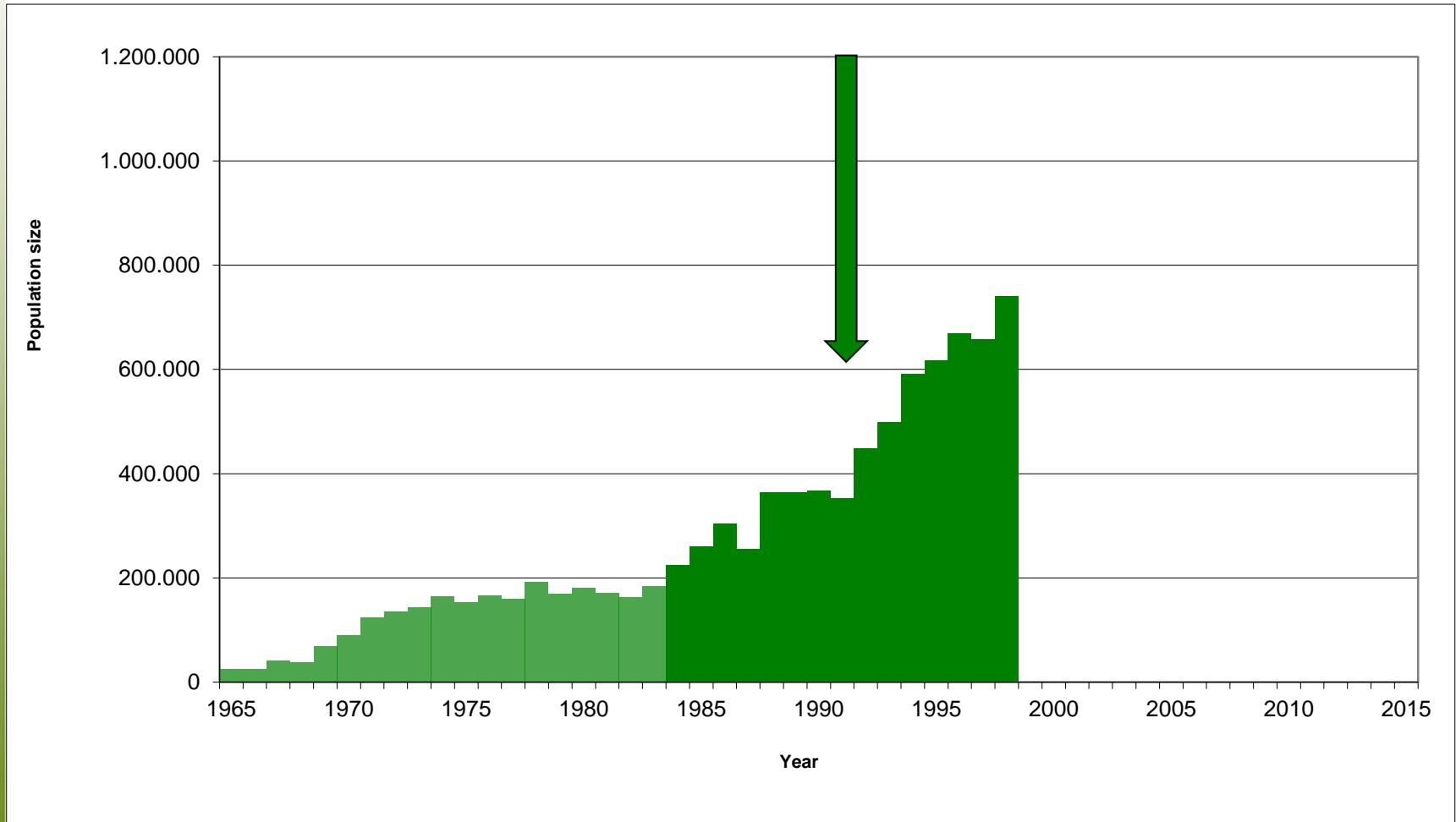
History of the population size



History of the population size

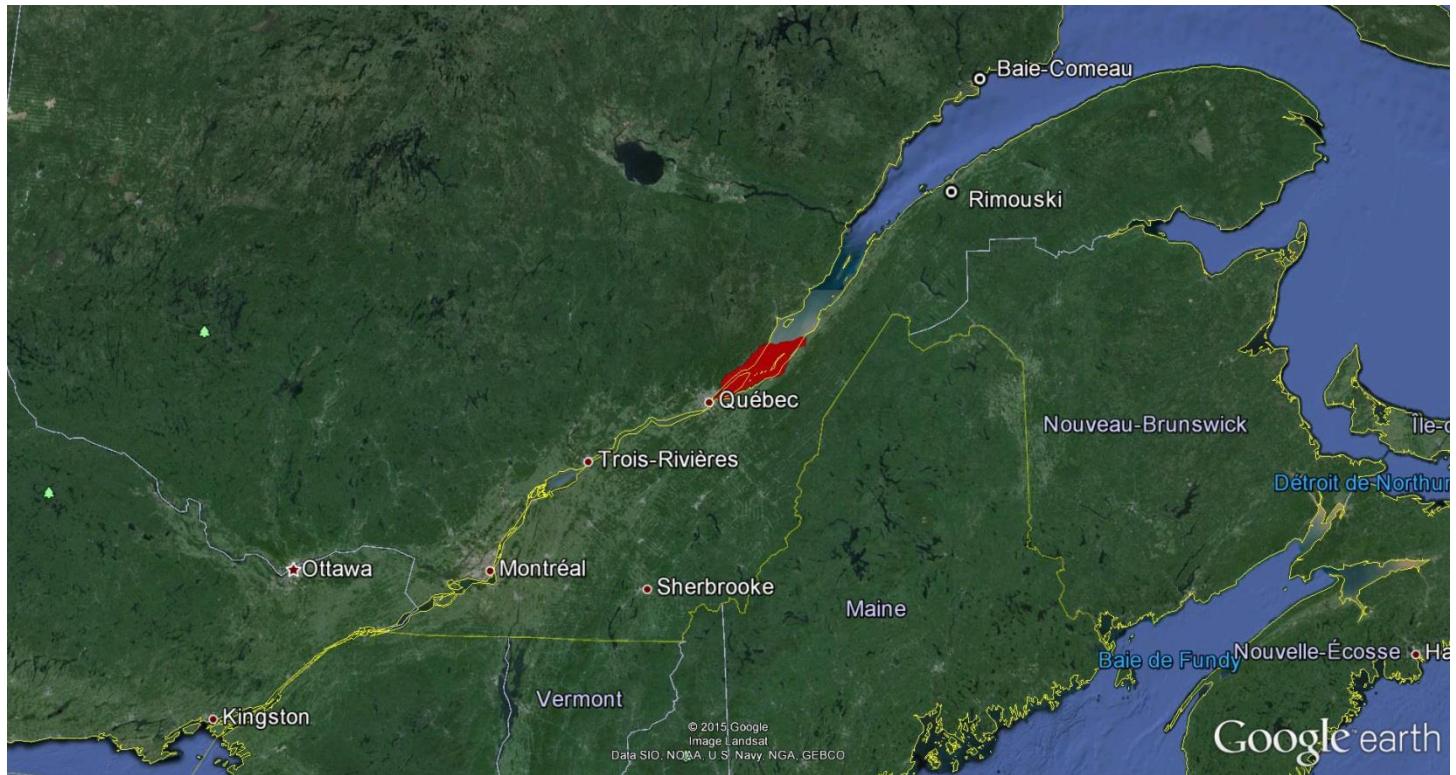


History of the population size



Greater Snow Goose distribution

- Spring distribution - early 1960s

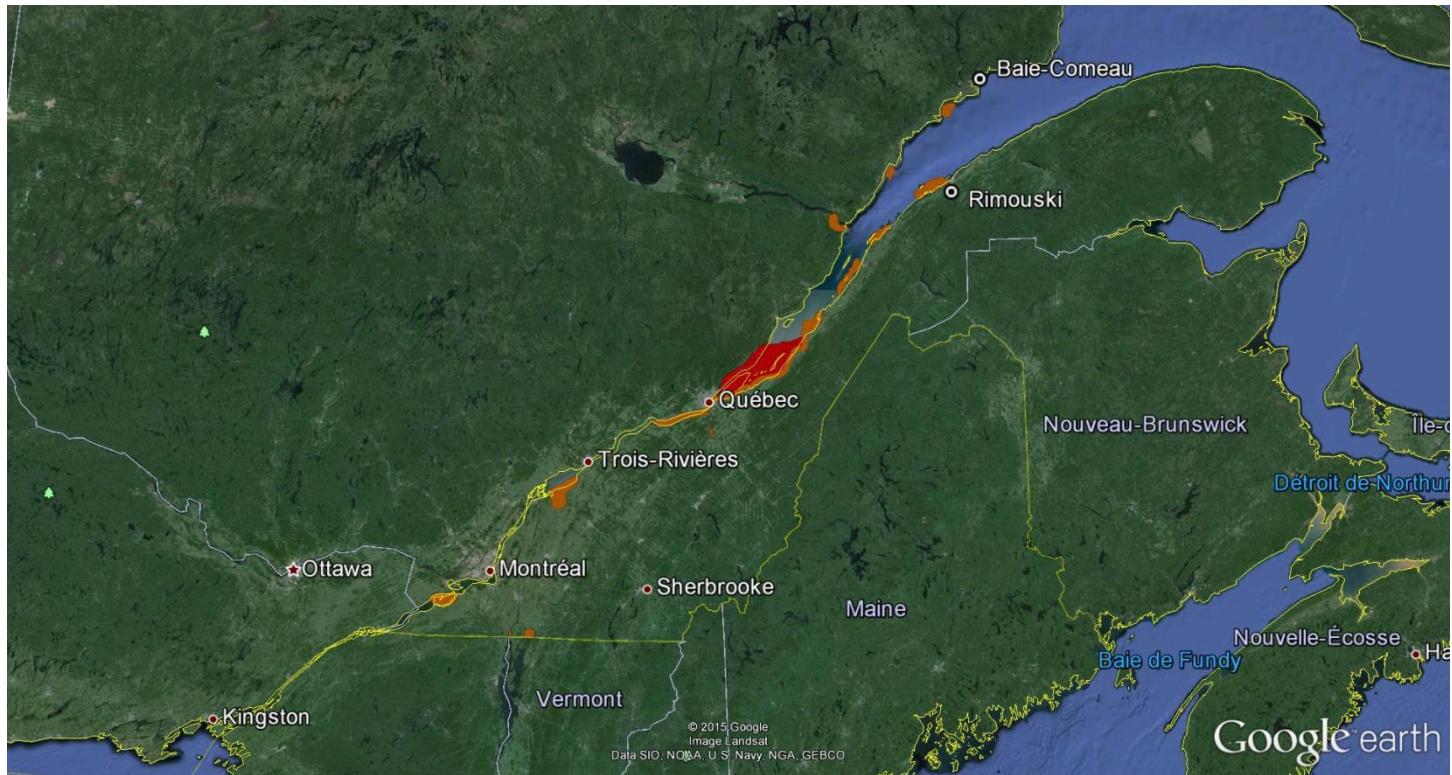


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Greater Snow Goose distribution

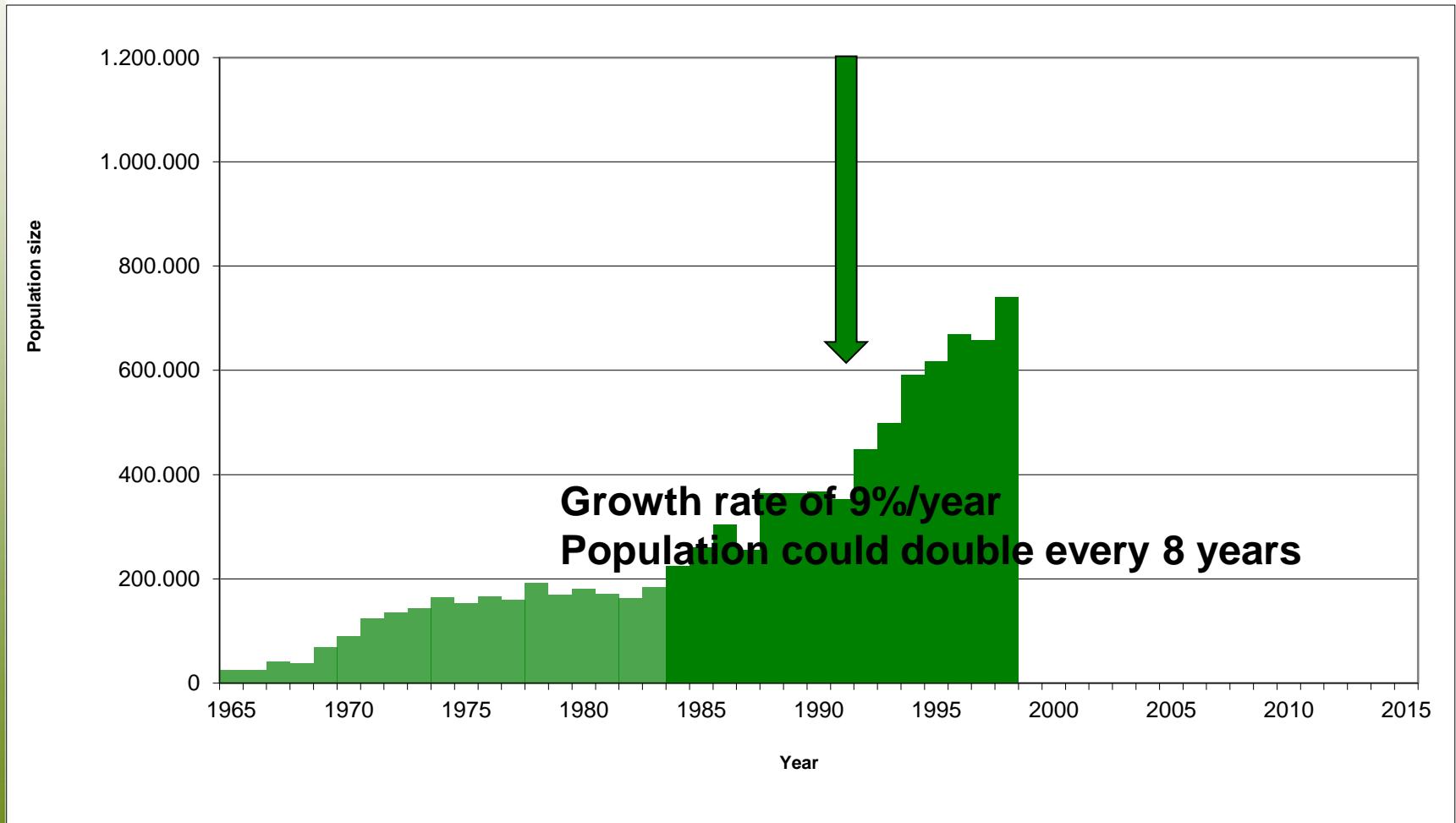
- Spring distribution - early 1990s



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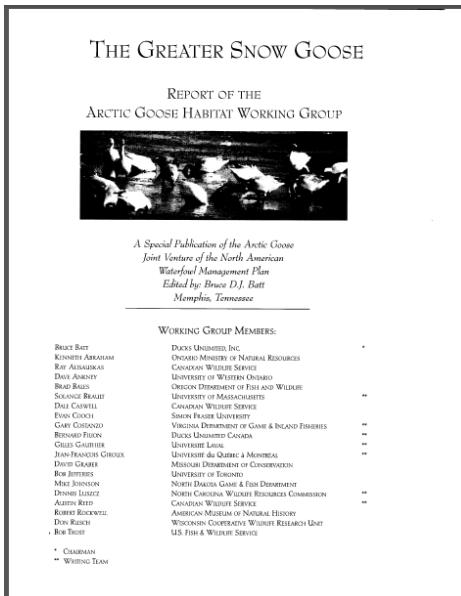
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History of the population size



The Arctic Goose Habitat Working Group

- Composed of universities researchers, government researchers, government biologists and NGO's biologists
- First scientific report of the state of the population



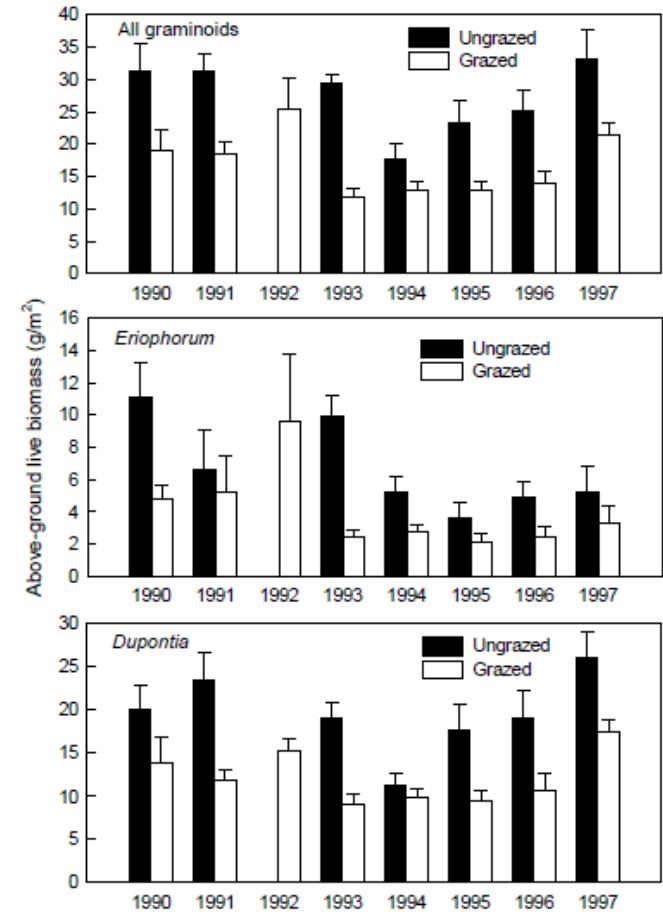
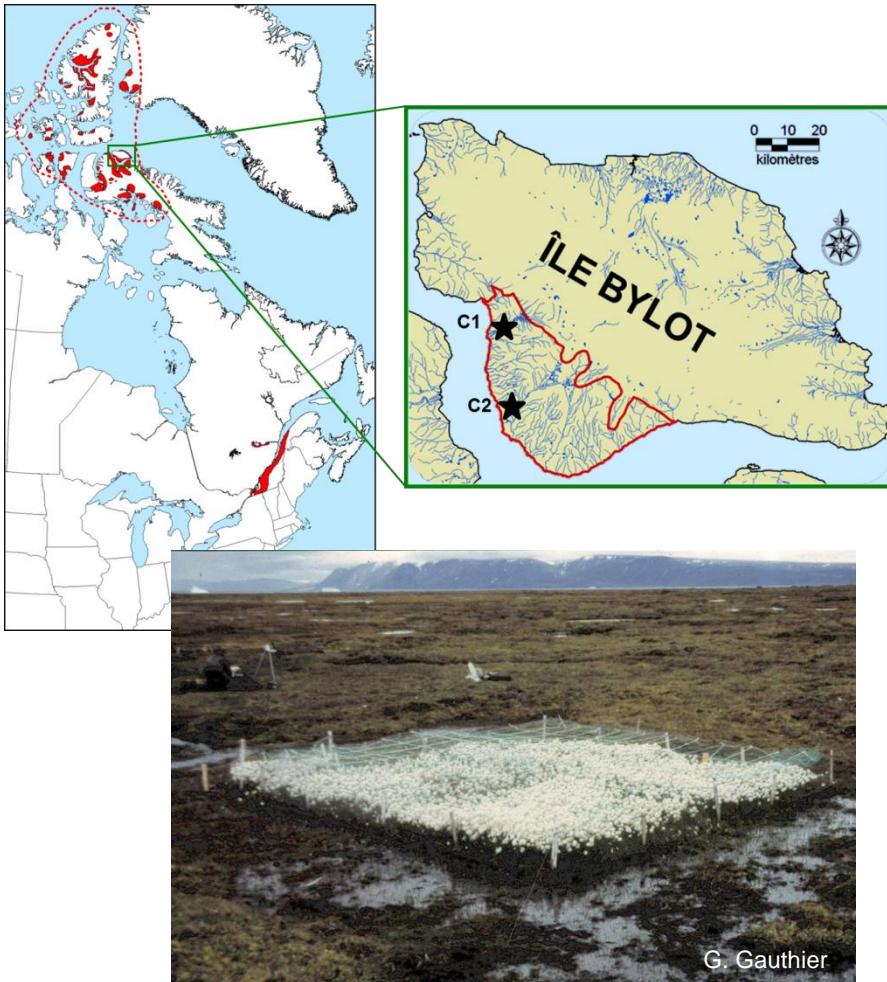
Batt, B. D. J., editor. 1998. The Greater Snow Goose: report of the Arctic Goose Habitat Working Group. Arctic Goose Joint Venture Special Publication. U.S. Fish and Wildlife Service, Washington, D.C. and Canadian Wildlife Service, Ottawa, Ontario. 88pp.



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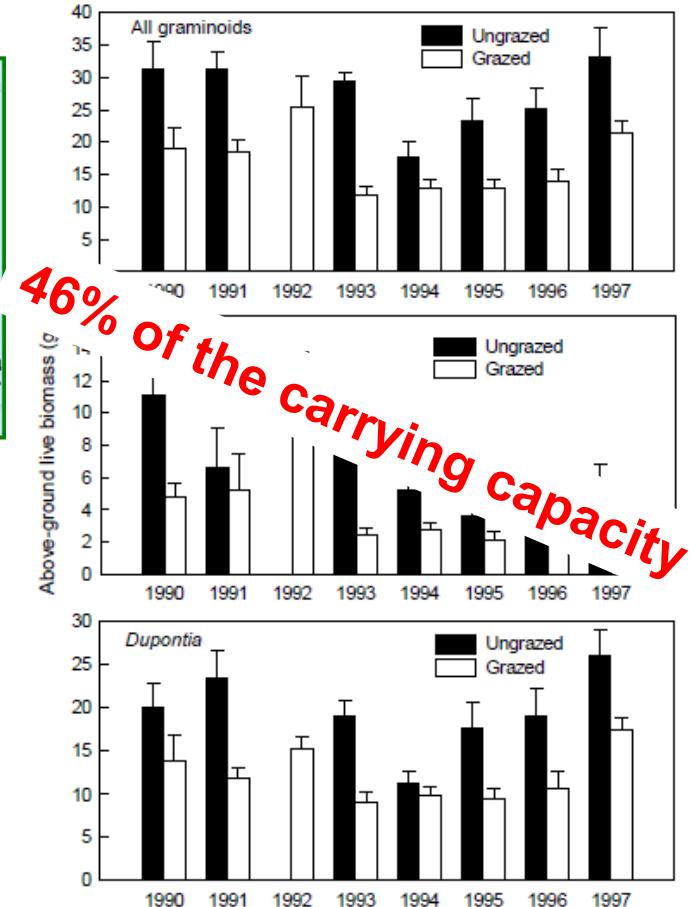
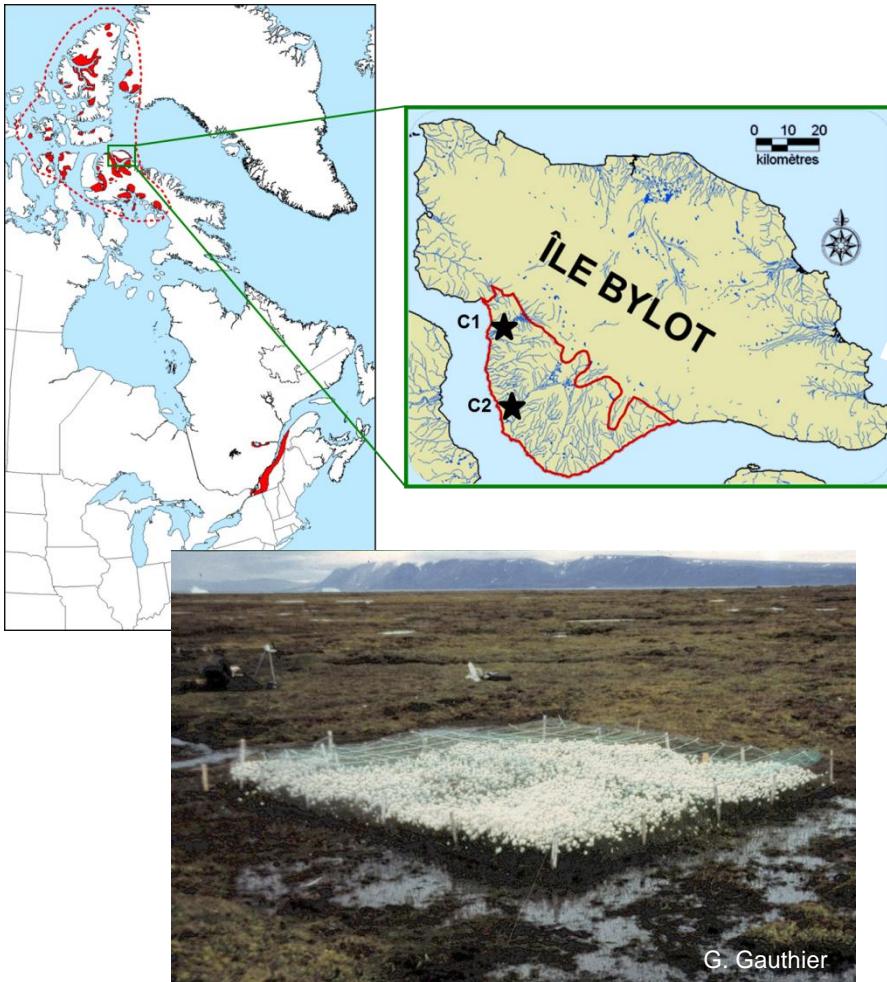
Concerns – Arctic habitat



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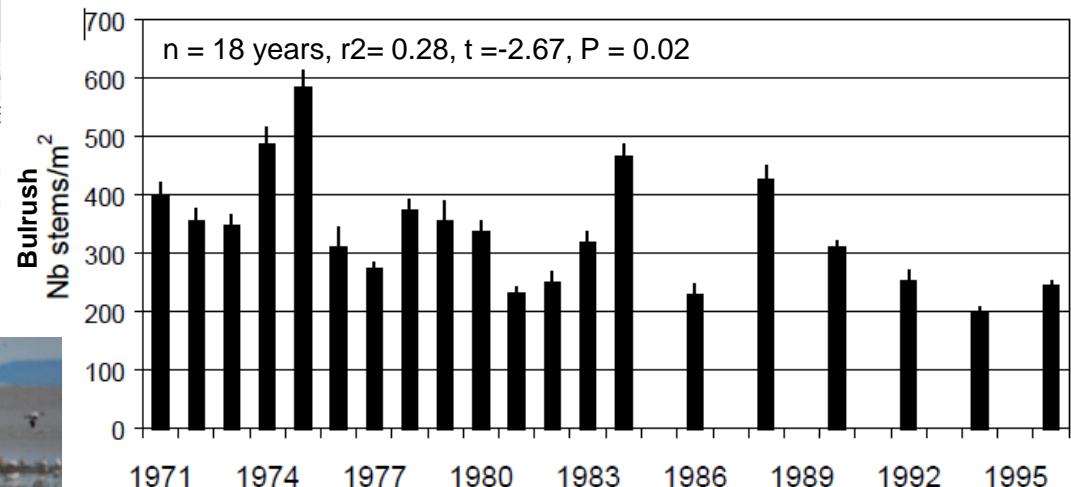
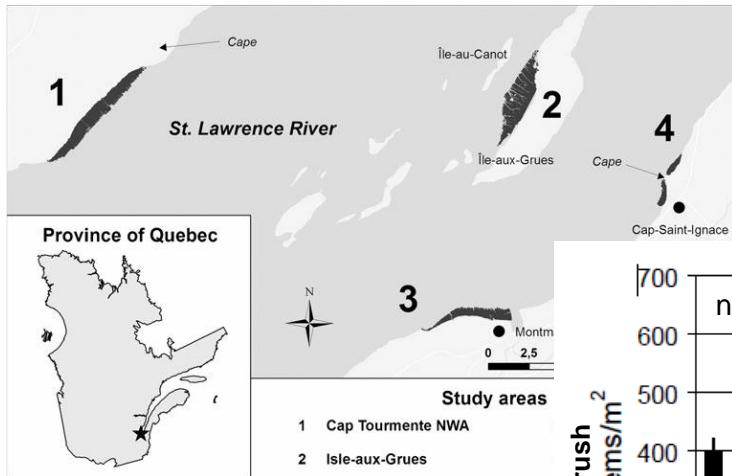
Concerns – Arctic habitat



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Concerns – Staging area habitats



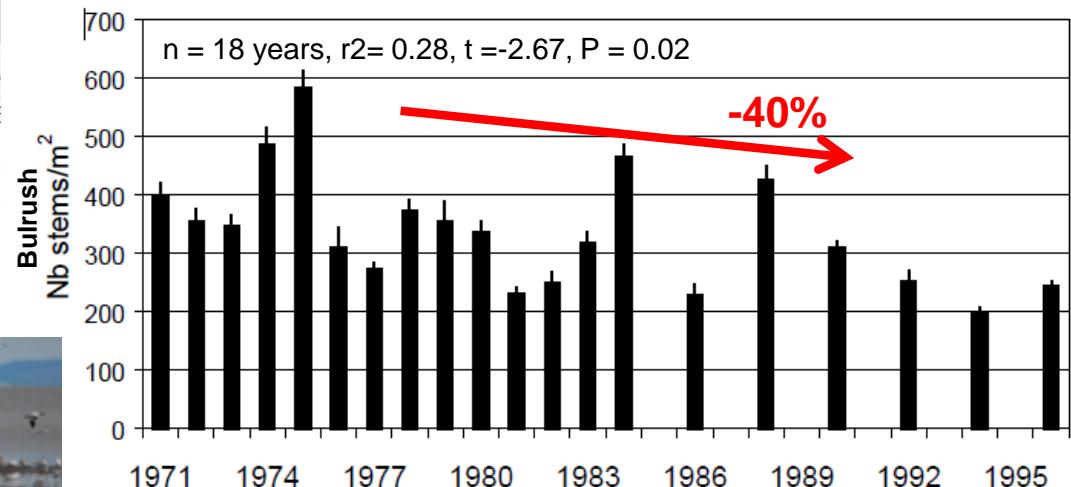
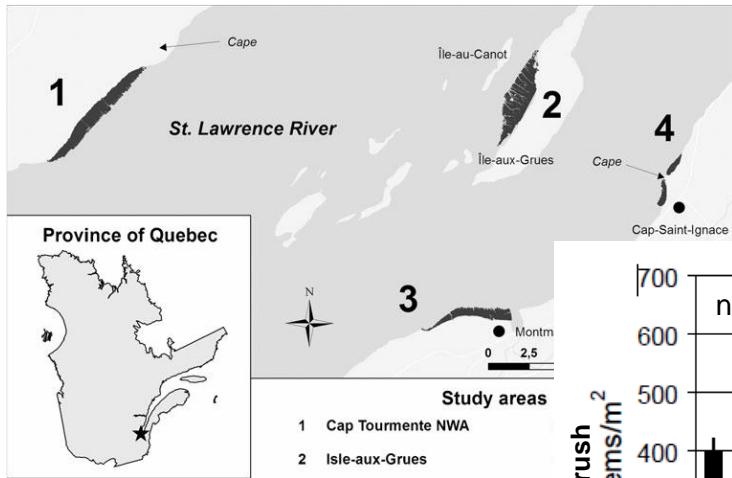
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Concerns – Staging area habitats



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Concerns – Wintering habitats



- Eat-outs (areas denuded of vegetation) in salt marshes
- In limited areas



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Impacts on farmlands

Year	Producers	Ha affected	Estimated losses	
			(\$ CND)	(€)
1992	297	3 309	466 589	315 503
1993	160	1 427	211 514	142 117
1994	393	4 188	534 891	359 396
1995	391	6 508	904 043	607 430
1996	365	4 884	844 213	567 230
1997	396	4 656	537 280	326 083



The Arctic Goose Habitat Working Group

- Management recommendation – Giroux et al. 1998

The population level should be stabilized by 2002 at 1 million birds or less.



The Arctic Goose Habitat Working Group

- Management recommendation follow-up
 - Snow Goose was declared an overabundant species – 1998
 - Special conservation measures
 - Liberalization of regulations during hunting season – 1998
 - Canada
 - Baiting and electronic calls are allowed
 - Sneaking not prohibited anymore
 - U.S.
 - Increase of bag and possession limits
 - Spring conservation harvest – 1999
 - Canada
 - First time since the signature of the Migratory Birds Convention Act
 - Only in agricultural fields
 - Conservation Order – 2009
 - U.S.
 - Allowing electronic calls, extended hours, more than 3 shot shells



Effects of the special conservation measures

- Second scientific report

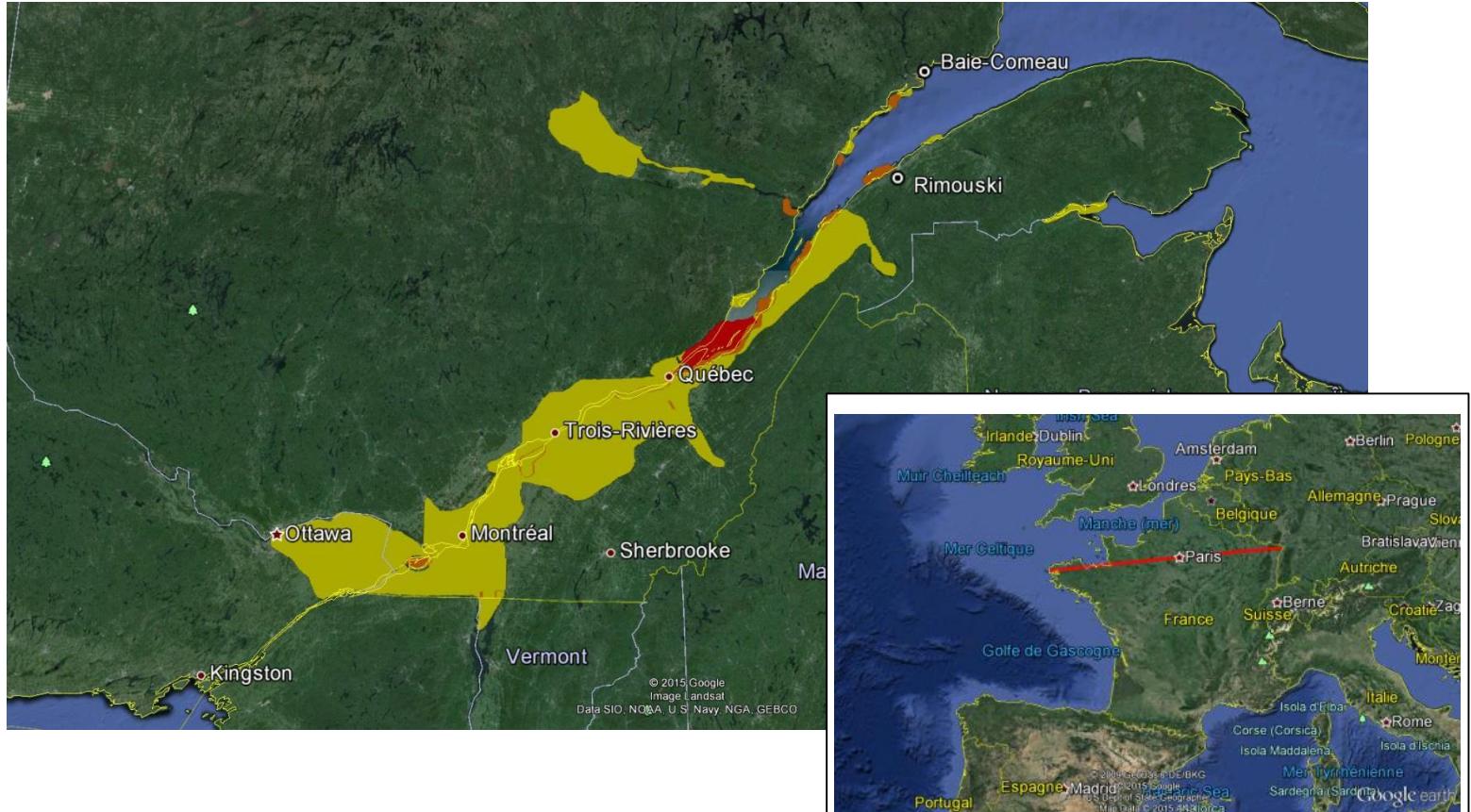


REED, E.T. and A.M. CALVERT (eds.). 2007. Evaluation of the special conservation measures for Greater Snow Geese: Report of the Greater Snow Goose Working Group. Arctic Goose Joint Venture Special Publication. Canadian Wildlife Service, Sainte-Foy, Quebec. 85 pp. + appendices.



Effects of the special conservation measures

- Spring distribution



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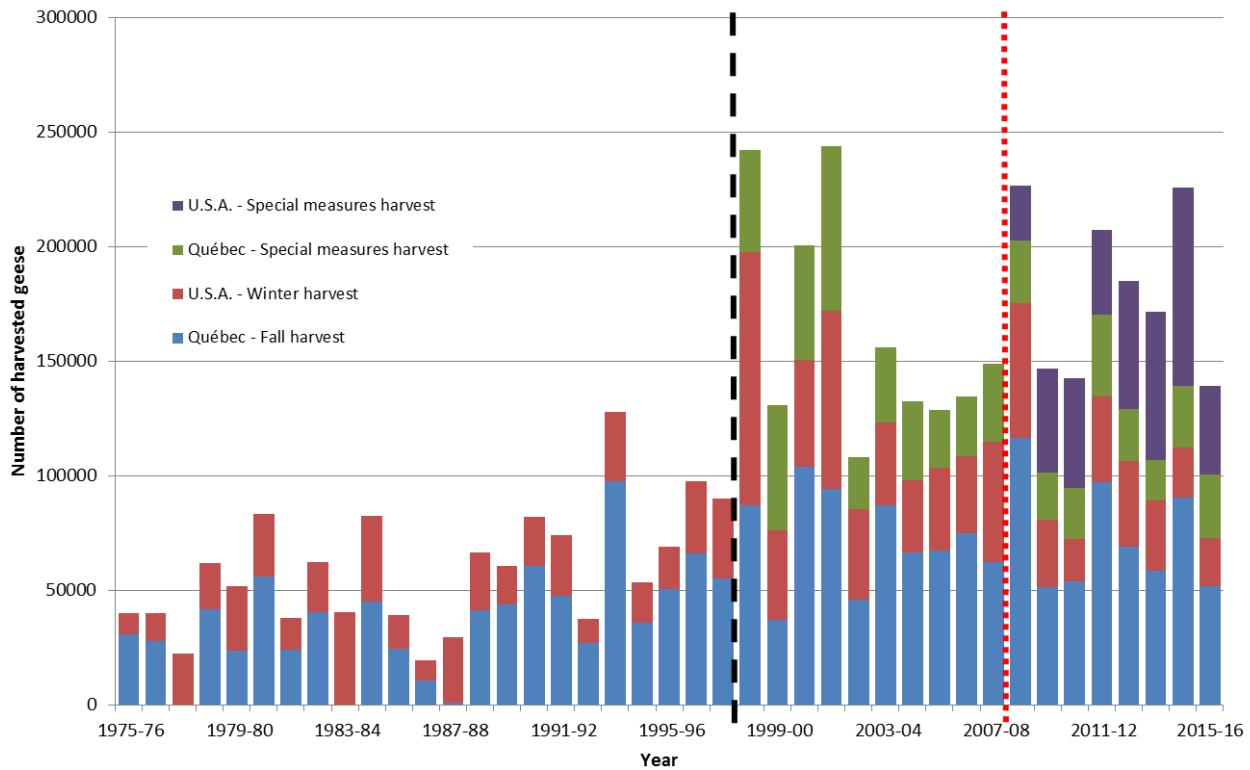
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Effects of the special conservation measures

- Harvest

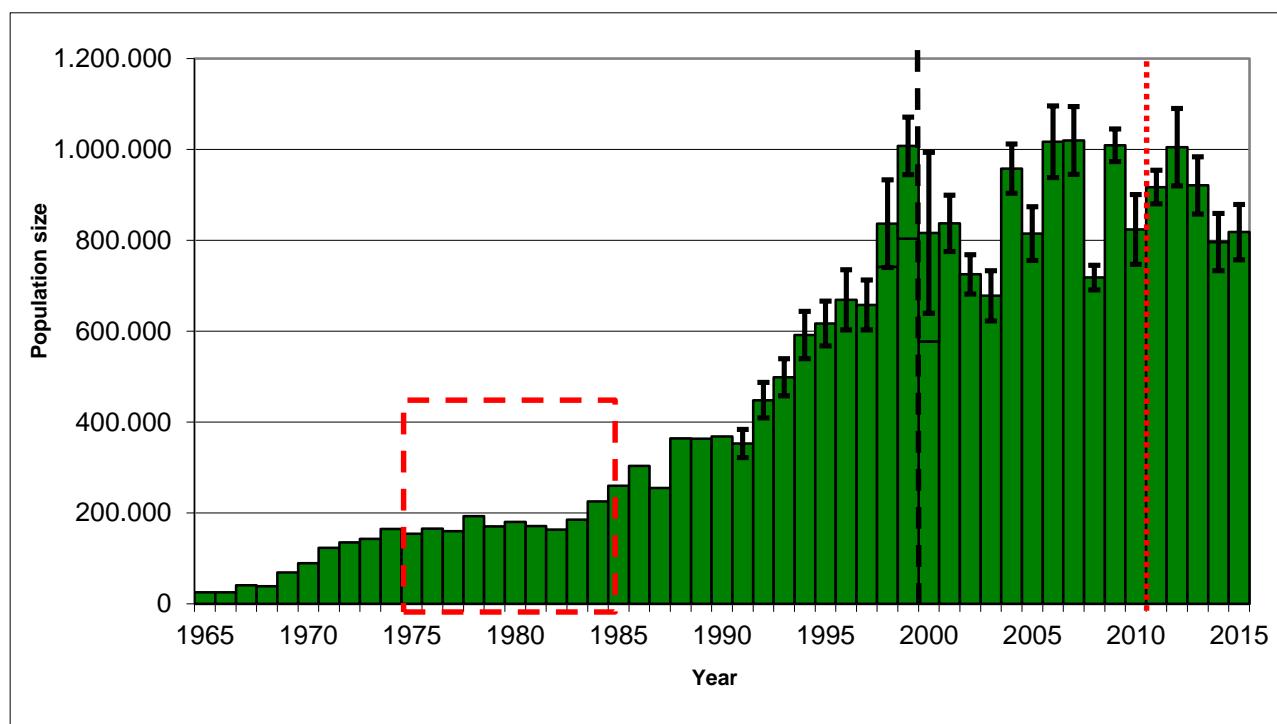


Effects of the special conservation measures

- Abundance and harvest rate



Period	Adult harvest rate
1975-1984	11.5%
1985-1997	6.1%
1998-2002	12.9%
2003-2007	8.4%
2008-2011	11.0%
2012-2014	13.5%
2015	11.5%

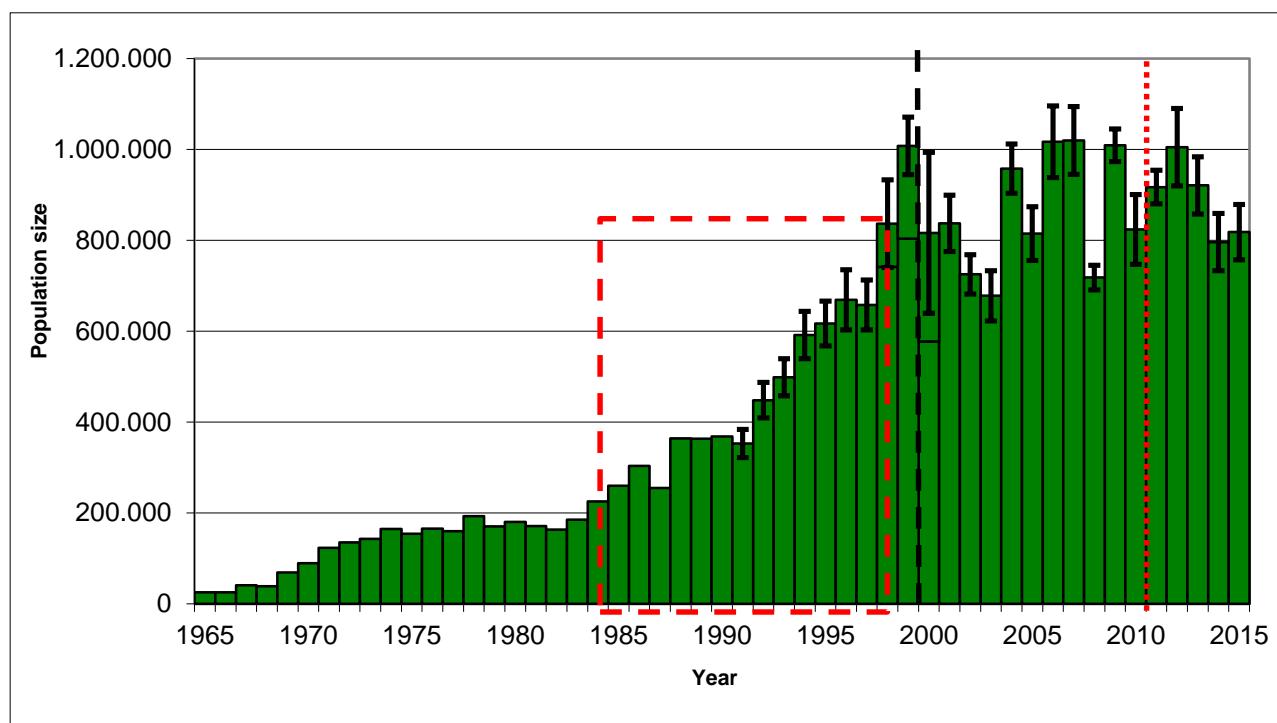


Effects of the special conservation measures

- Abundance and harvest rate



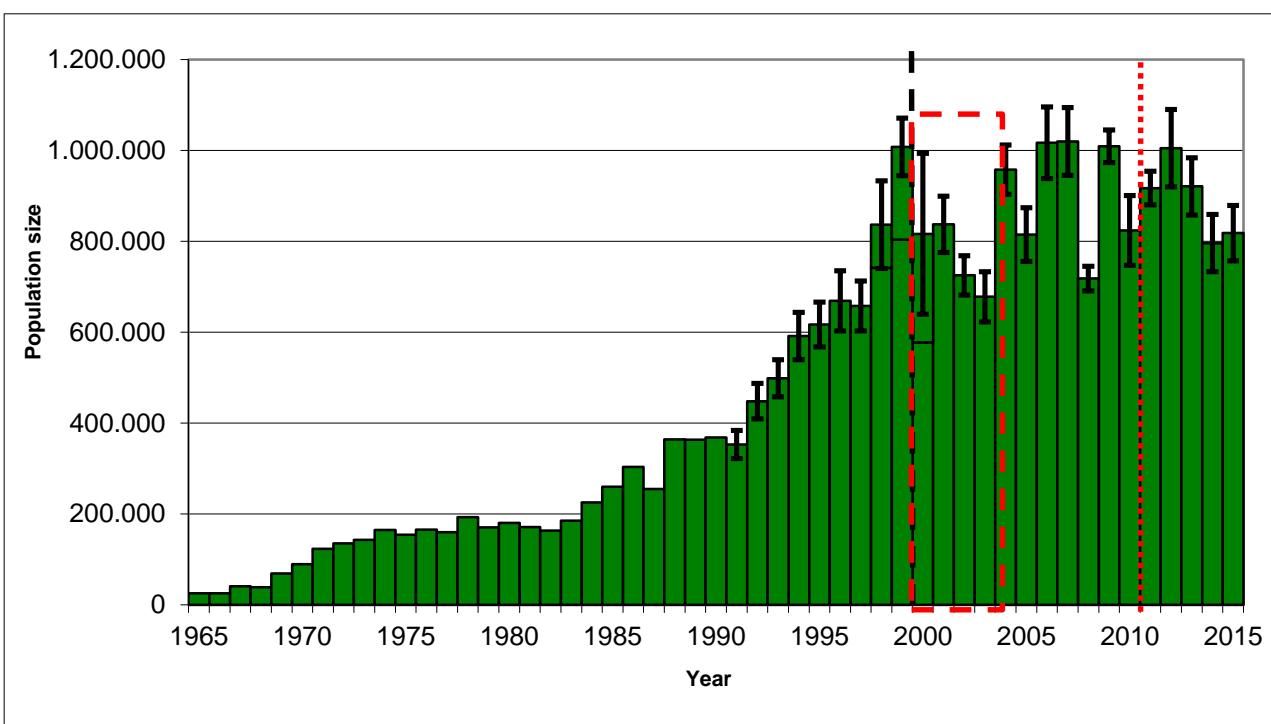
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Effects of the special conservation measures

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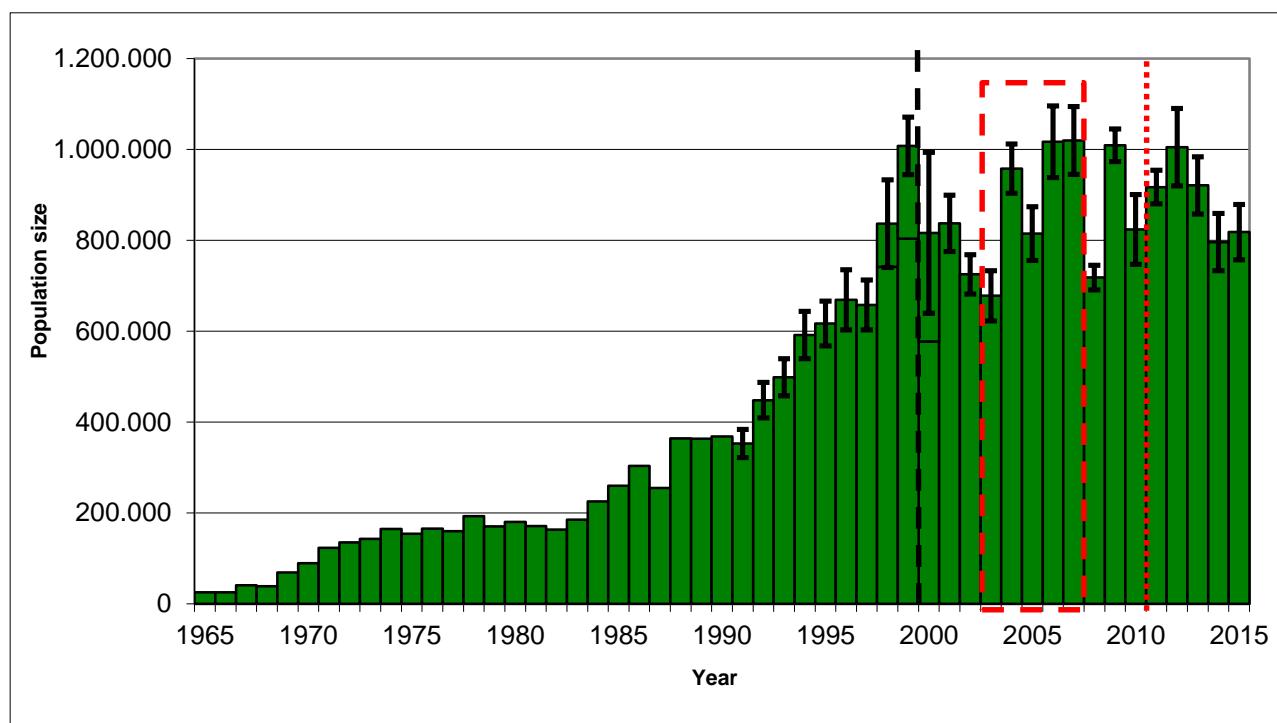
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Effects of the special conservation measures

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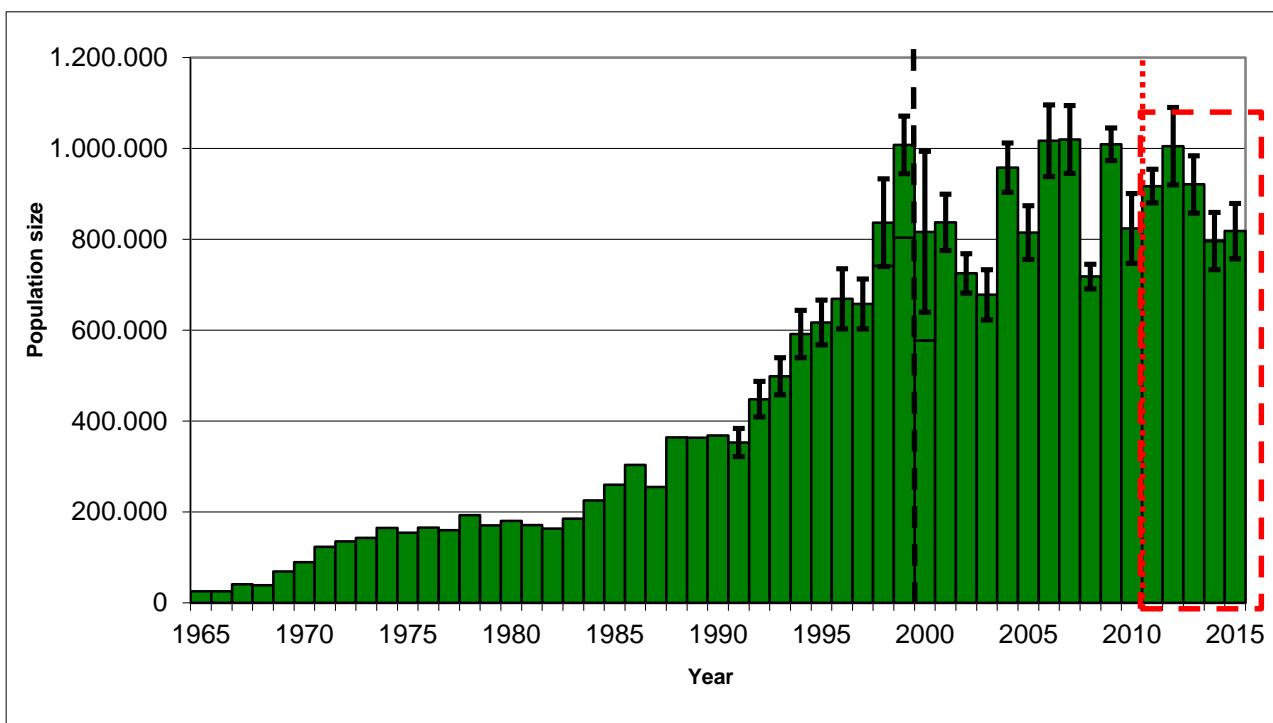
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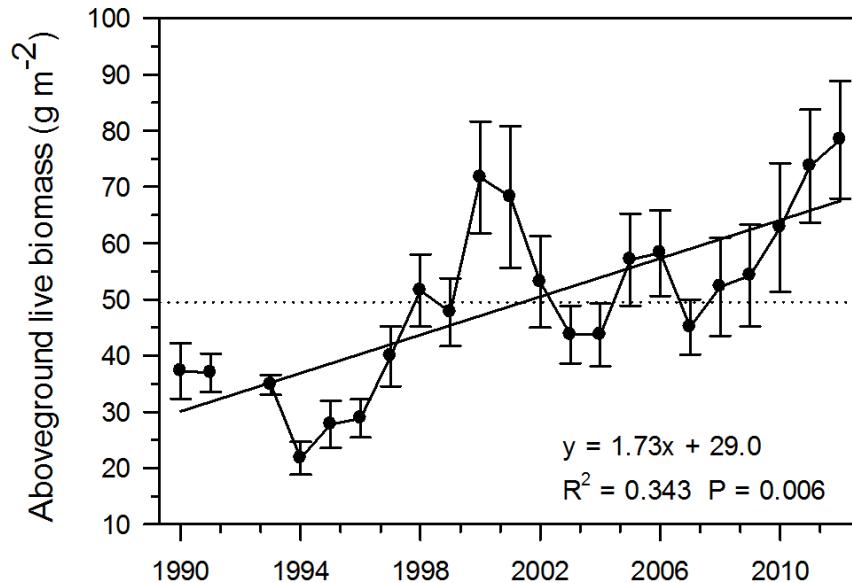
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Effects of the special conservation measures

- Impacts on natural habitats
 - Arctic – high plant productivity

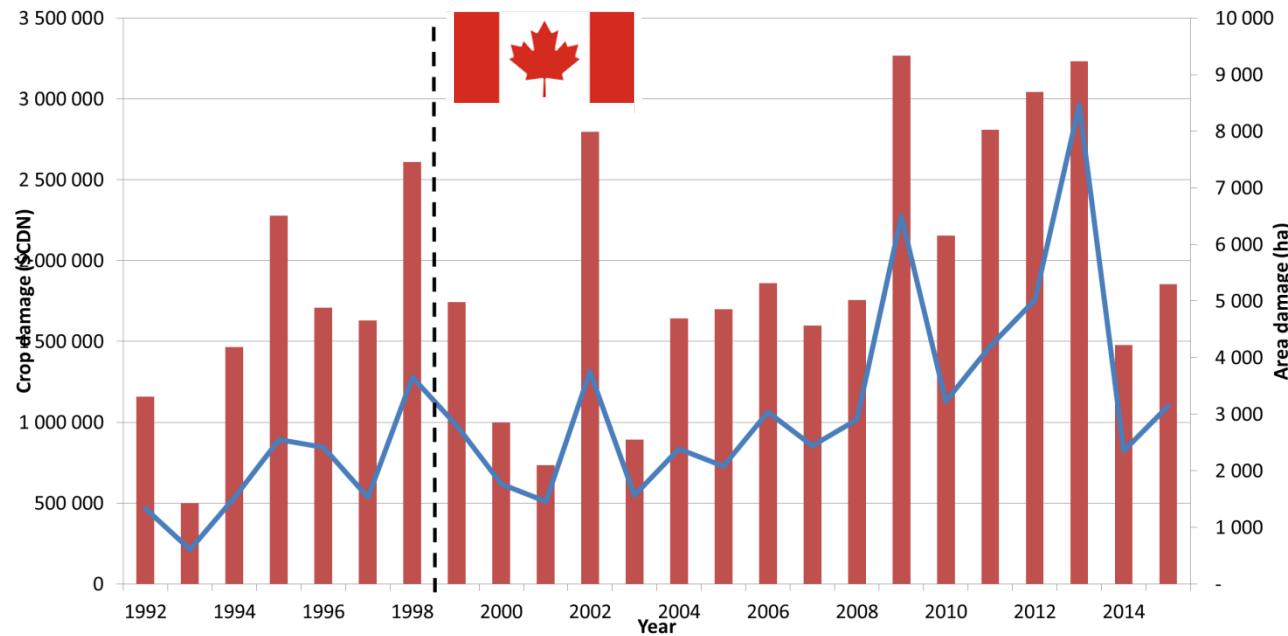


- Staging areas – no evidence
- Wintering areas – no change in recent years



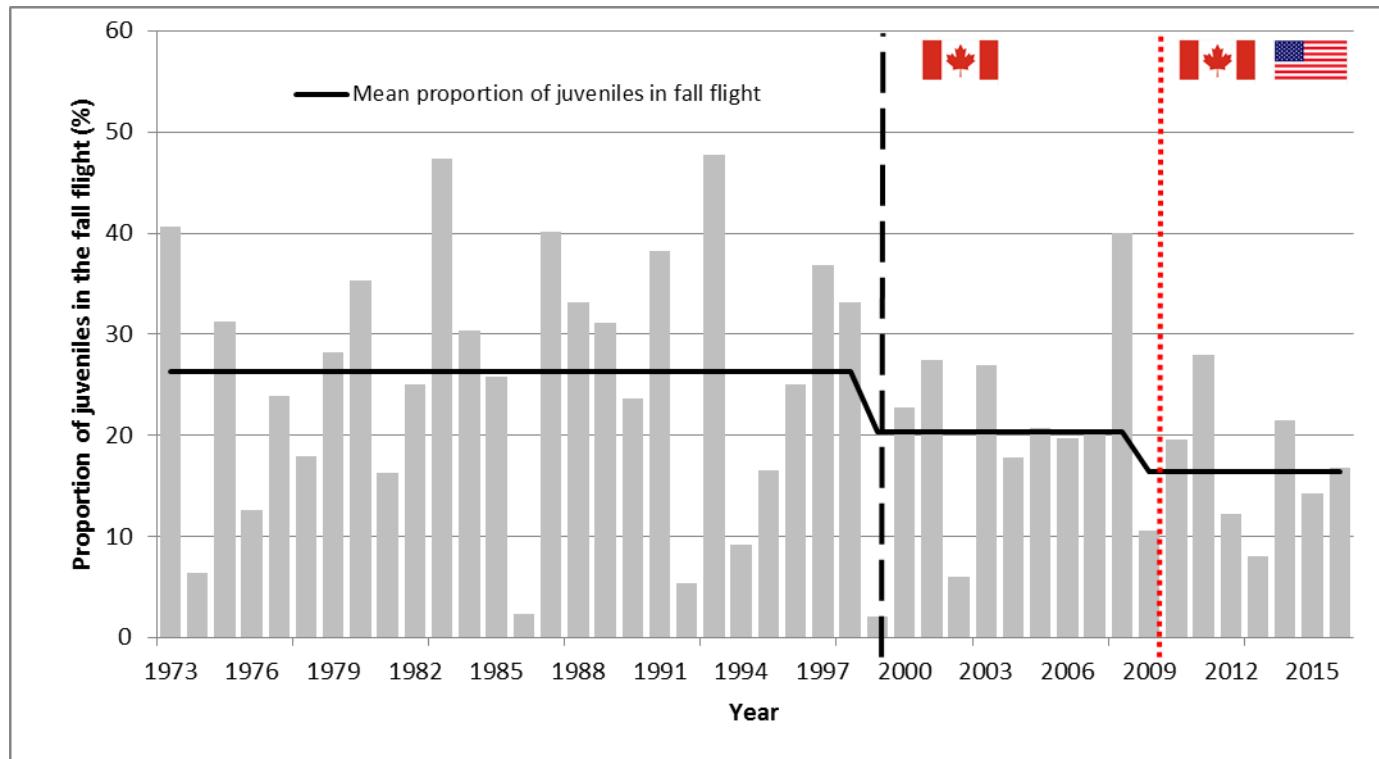
Effects of the special conservation measures

- Impacts on farmlands



Effects of the special conservation measures

- Productivity – carry-over effect



What have we done?

- Long-term collaboration
- Extended monitoring and research programs



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Greater Snow Goose monitoring

- Probably one of the most studied birds in North America
 - Annual basis
 - Spring survey – 1965 to date
 - Breeding and habitat monitoring - 1989 to date
 - Banding activities - 1989 to date
 - Fall productivity survey – 1973 to date
 - Neck collar observation - 1989 to date
 - Harvest survey – 1967 to date
 - Spring harvest survey – 1999 to date
 - Sporadic basis
 - Brood survey – 1983 to 2008
 - Bulrush marsh productivity - 1971 to 2006
 - VHF telemetry – 1998 to 2000
 - Satellite telemetry – 2006 to 2011



A. Lanouette

What have we done?

- Long-term collaboration
- Extended monitoring and research programs
- Development population models
- Technical committee on integrated management of Greater Snow Goose – since 1996
- Scientific reports published - 1998, 2007, 2019*
- Set a population goal



Population goal

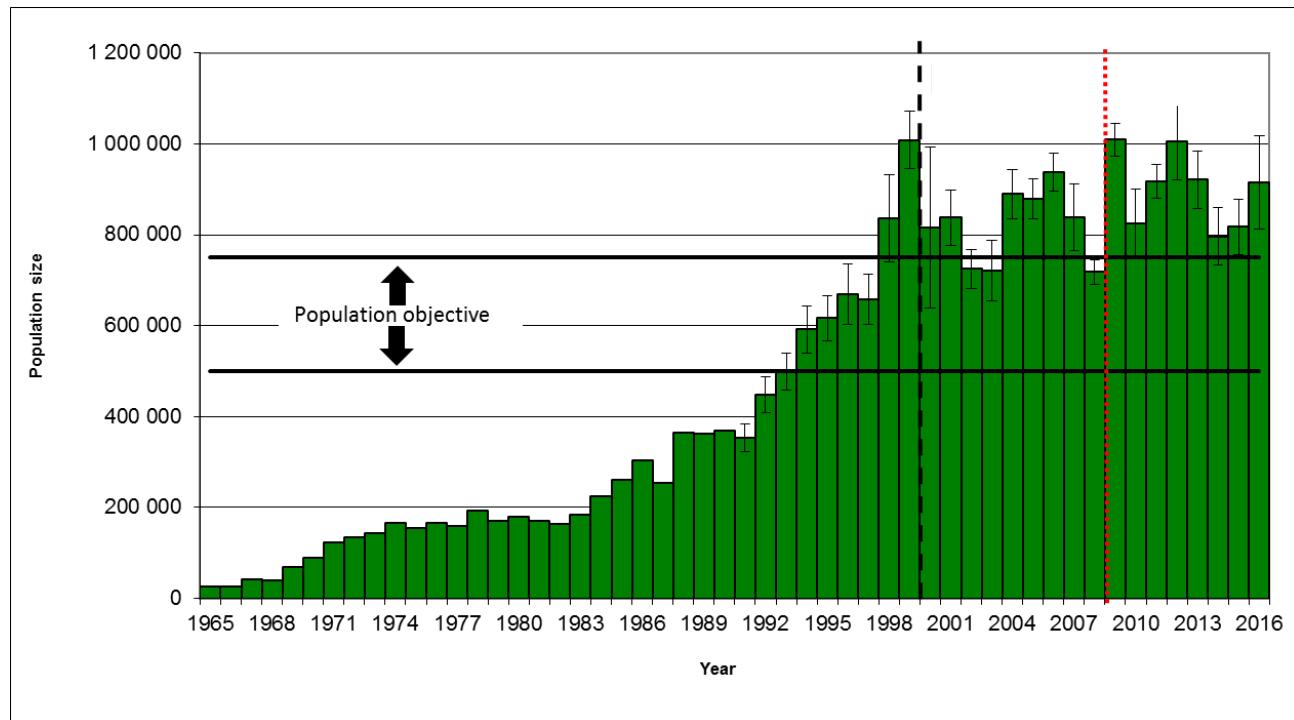
Population size	Population status	Use of farmlands versus natural habitat in relation to carrying capacity (K)	Socio-economic values ^a	Hunting and population control
0–250 000 geese	Historical level population	Wetland ≥ Farmlands	Benefits = Costs	Restrictive regulations
		Arctic breeding habitats < K	Localized benefits and low crop damage	
		Migration & wintering natural habitats < K		
250 000–500 000 geese	Abundant population	Farmlands > Natural	Benefits > Costs	Standard to liberal regulations
		Arctic breeding habitats < K	Widespread benefits and moderate crop damage	
		Migration & wintering natural habitats ≈ K		
500 000–750 000 geese ^b	Very abundant population	Farmlands ≫ Natural	Benefits ≫ Costs	Liberal regulations
		Arctic breeding habitats < K	Very high benefits and high crop damage	
		Migration & wintering natural habitats > K		
750 000–1 000 000 geese	Over abundant population	Farmlands ≫ Natural	Benefits > Costs	Liberal regulations and special
		Arctic breeding habitats < K	Saturation of benefits and very high crop damages	conservation measures (spring harvest)
		Migration & wintering natural habitats > K		

^aConsider all socio-economic benefits related to the presence of geese including activities such as hunting, bird watching, tourism, etc

^bCurrent population objective



Population goal



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What have we done?

- Long-term collaboration
- Extended monitoring and research programs
- Development population models
- Technical committee on integrated management of Greater Snow Goose – since 1996
- Scientific reports published - 1998, 2007, 2019*
- Set a population goal
- Management plan for Greater Snow Geese in the Atlantic Flyway - 2009
- Publication and implementation of Action Plans – 1997-2002, 2005-2010, 2013-2018*



‘Biological’ challenges

- Snow Geese are highly adaptable
- Favorable environmental conditions are still present



J. Lefebvre



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Management challenges

- Consensus and a common vision
 - between countries/states
 - within the stakeholders
- ‘Tireness’ through time
 - Participation of the stakeholders
 - Recurrent funding
 - Hunters
- Regional management
 - Develop relationship between farmers and hunters
 - Managing habitat for birders, tourists, etc.



S. Bourbeau



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Lessons learned

- Management decisions based on sound sciences
 - Long-term data
 - Partnership with universities
 - Analyzing effects of management measures
 - Population models
- Good monitoring programs
- Good network at each level



B. Gendreau



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Difficult issues remaining

- Management of geese at a local level
 - Lack of local people to lead initiatives
 - Involvement of many partners
 - Funding projects on a recurrent basis
 - Difficulties to export project from one region to the others





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Thank you! Dank je!

N. Bradette