



**HAL**  
open science

## Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques

Olivier Gilg, Jérôme Moreau, Loïc Bollache

► **To cite this version:**

Olivier Gilg, Jérôme Moreau, Loïc Bollache. Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques. Le Colloque "Arctique: Les Grands Enjeux Scientifiques", Collège de France. FRA., Jun 2013, Paris, France. hal-02805949

**HAL Id: hal-02805949**

**<https://hal.inrae.fr/hal-02805949v1>**

Submitted on 6 Jun 2020

**HAL** is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L'archive ouverte pluridisciplinaire **HAL**, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d'enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.

# Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques



Olivier GILG  
Jérôme MOREAU  
Loïc BOLLACHE



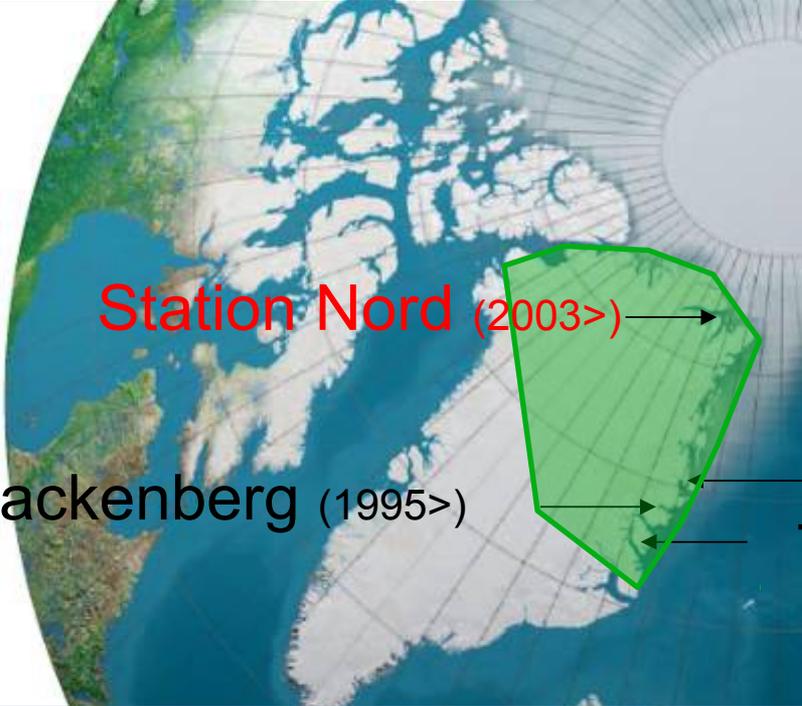
# Changements climatiques et interactions interspécifiques au sein d'une communauté de vertébrés terrestres arctiques



**1. Nord-Est  
Groenland :  
géographie  
logistique**

**2. Cycles du  
lemming :  
interactions  
prédateurs-proie**

**3. Proies  
alternatives et  
interactions  
indirectes**



Station Nord (2003>)

Zackenbergl (1995>)



Hochstetter Forland (2010>)

Trail Ø (1988>)















ROYAL ARCTIC LINE

MINA ARCTICA

UNIFLY

HELICOPTER

OY-HJN







## 2. Interactions prédateurs-proie au sein d'une communauté à dynamique cyclique

Chouette harfang



Labbe à longue queue



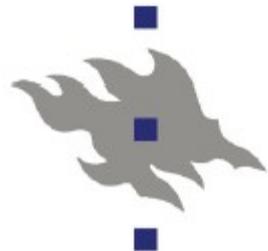
Renard polaire



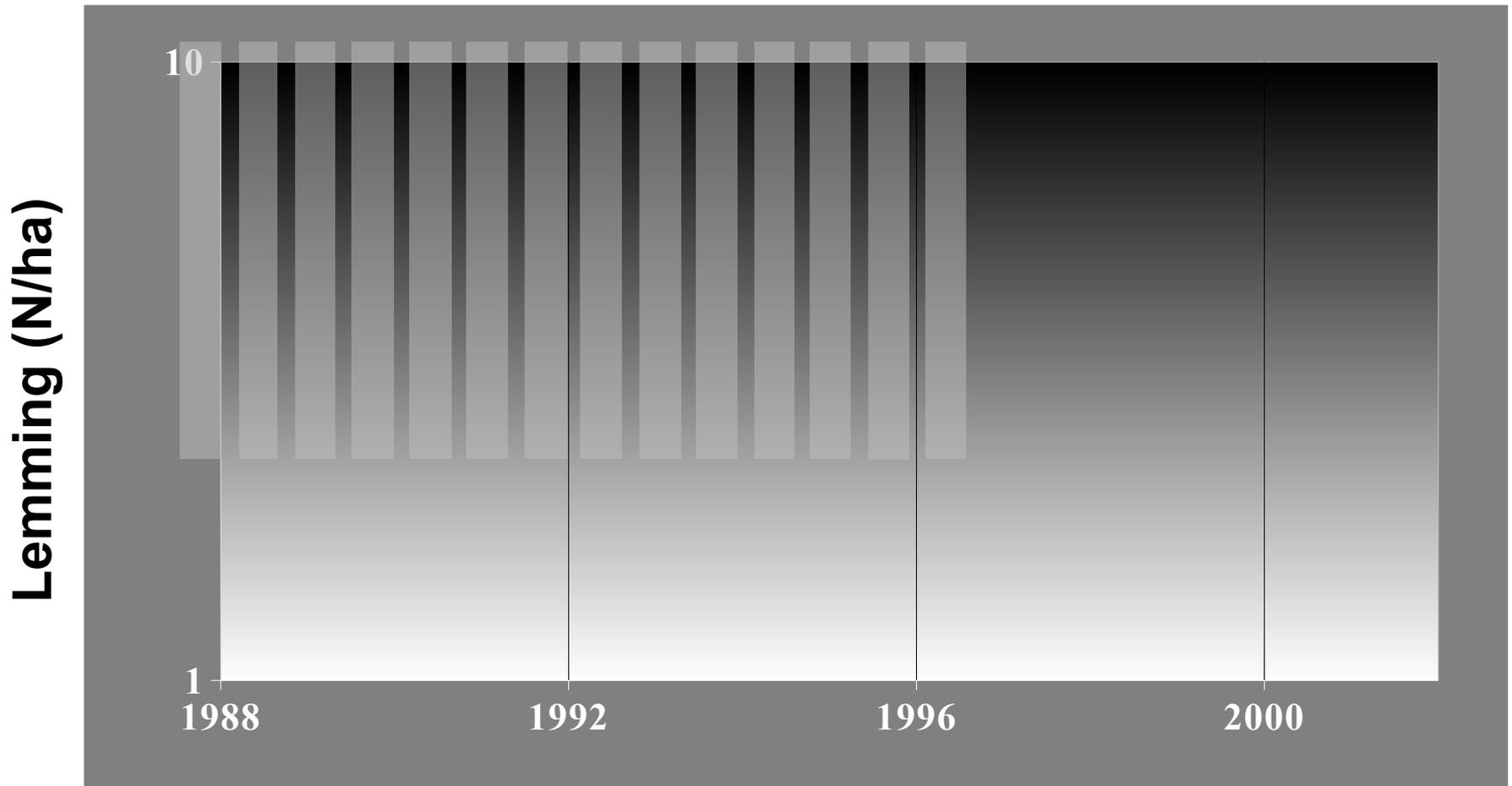
Hermine



lier

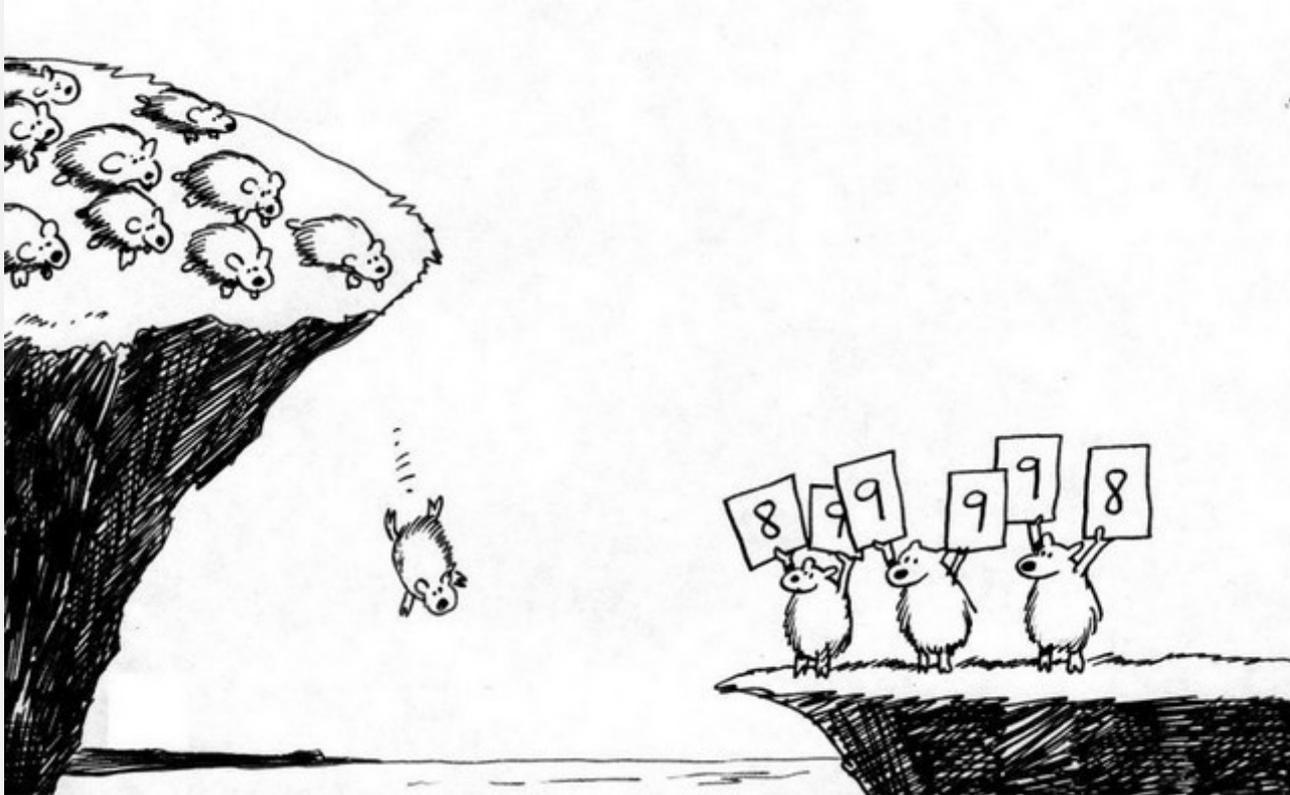


Cycles pluriannuels des lemmings

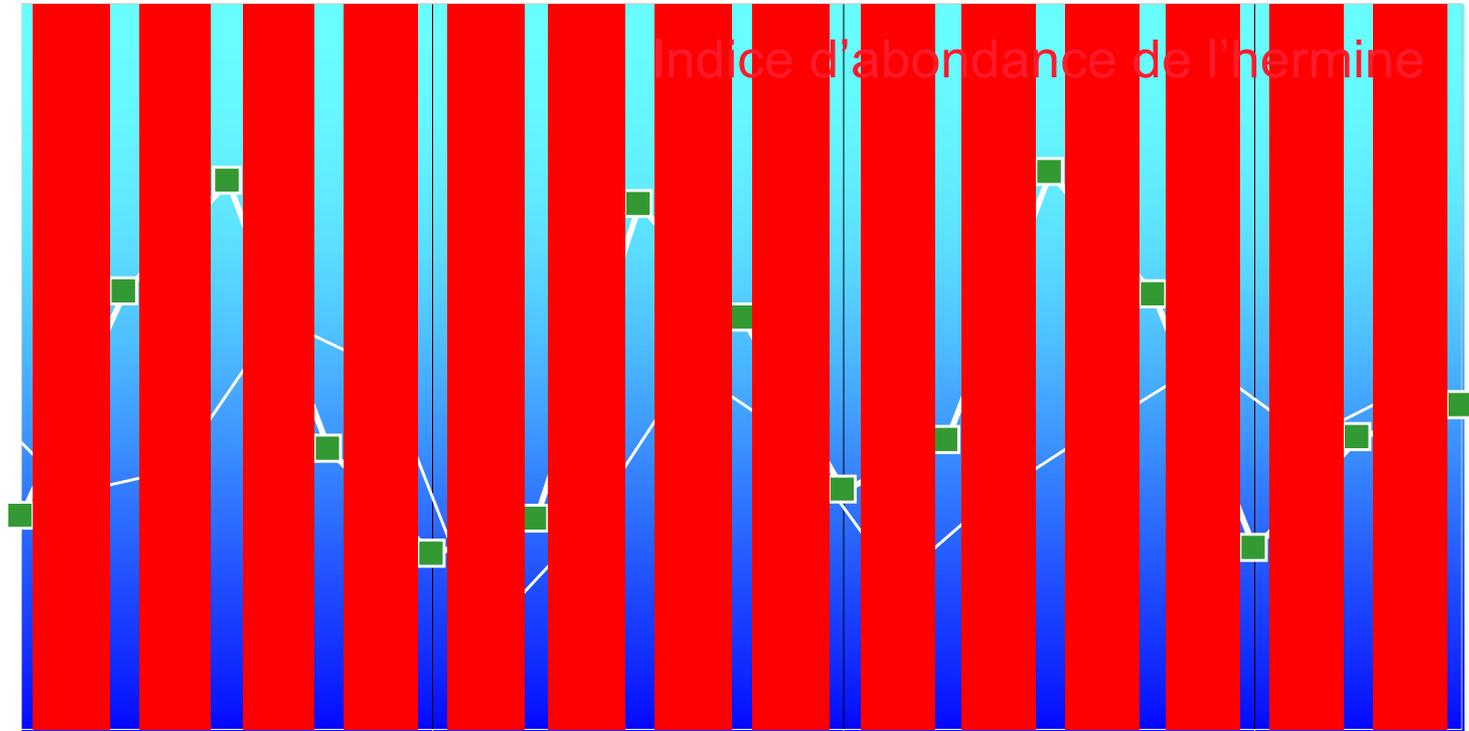


*Ann. Zool. Fenn.* 1995 (Sittler)  
*Oikos* 2002 (Gilg)  
*Oikos* 2006 (Gilg et al)

## Recherches antérieures



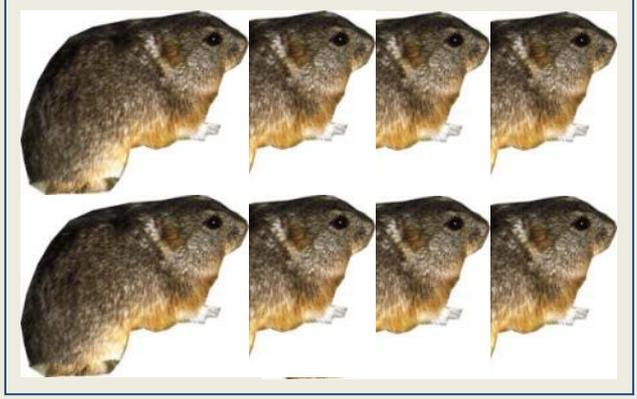
Densité dépendance différée (DDD) de l'hermine



# Recherches antérieures

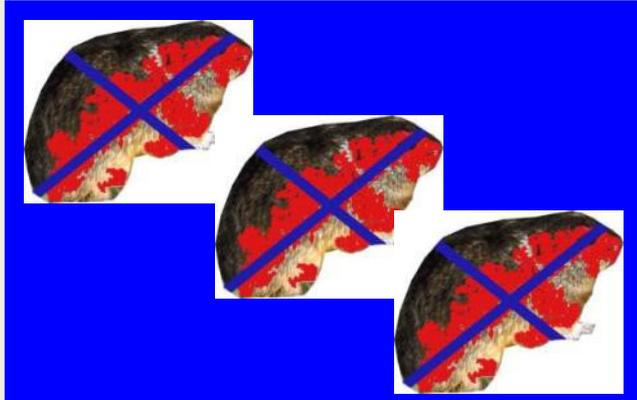
## Réponses des prédateurs

Densité de lemmings



Rép. numériques

Rép. fonctionnelle

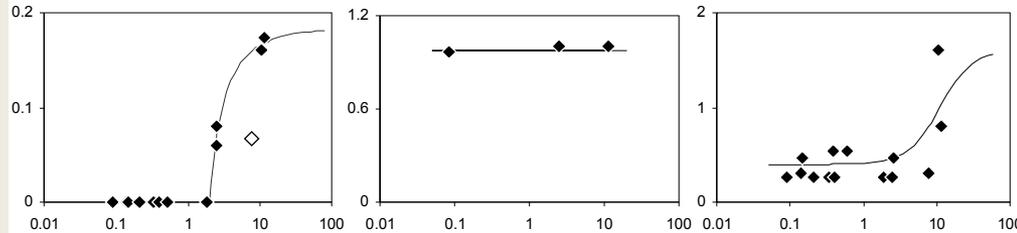


Réponse totale

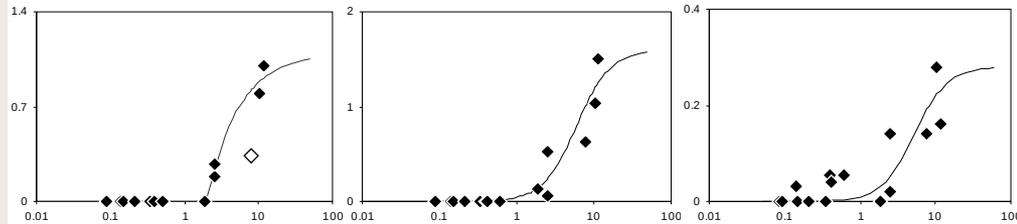


Chouette harfang    Labbe à longue queue    Renard polaire

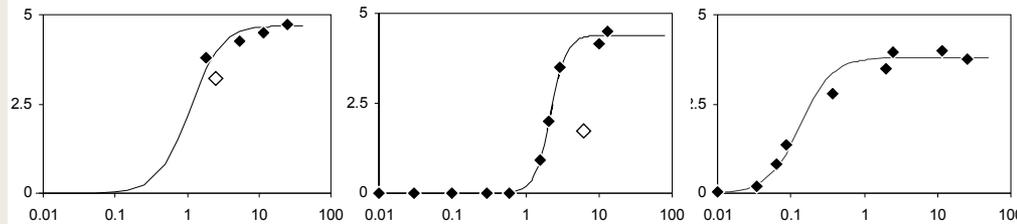
Réponses numériques (adultes)



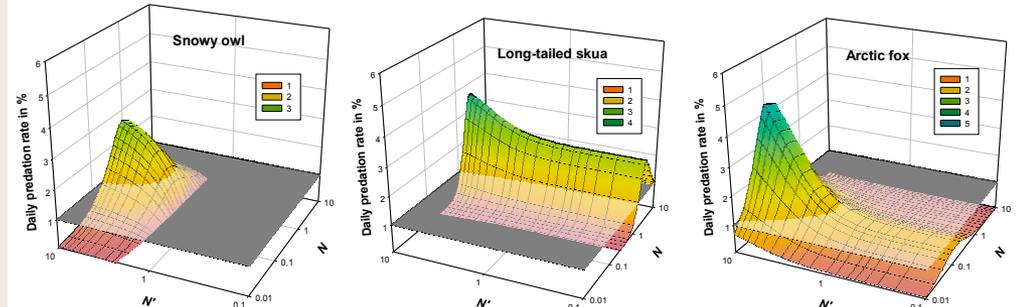
Réponses numériques (jeunes)



Réponses fonctionnelles

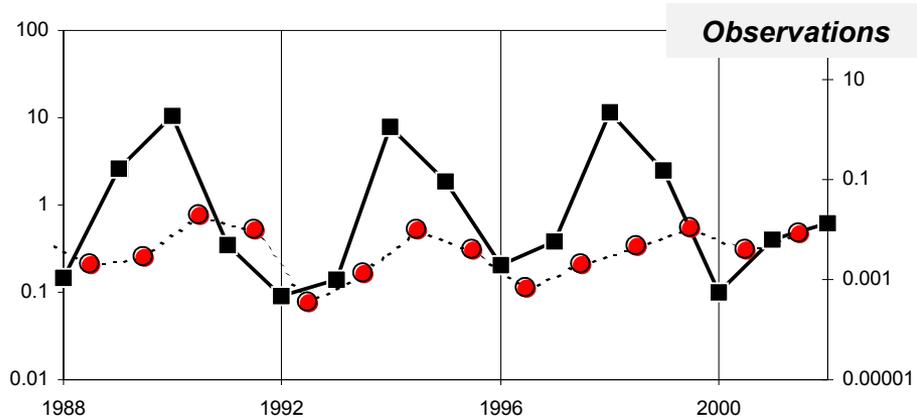


Réponses totales



Densités de lemmings

## Validation de l'hypothèse prédation



Simulations

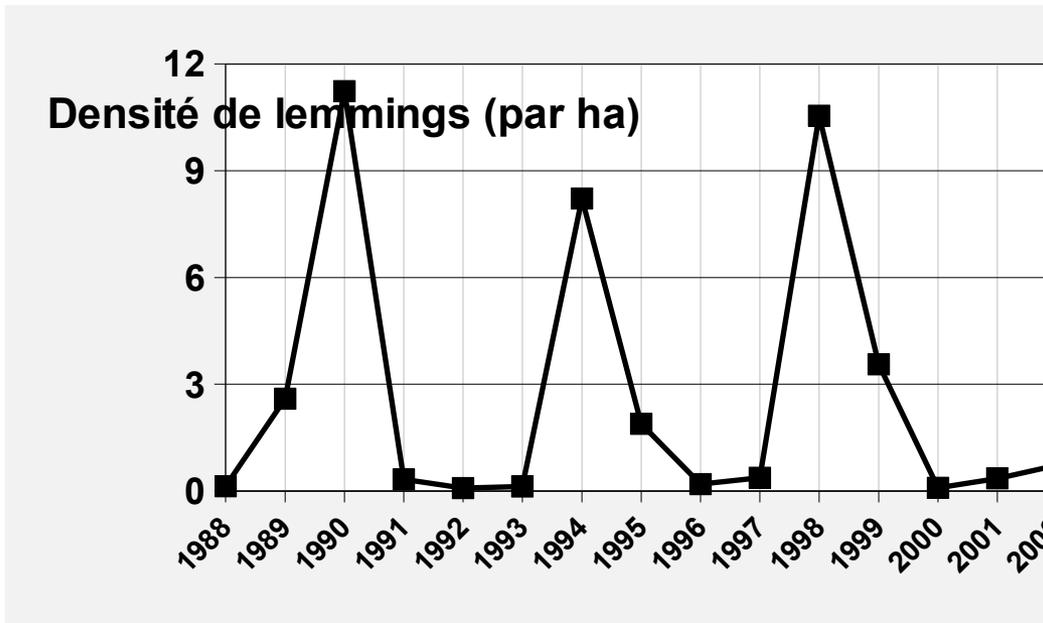
Lemming

$N$   
(lemmings / hermines)

Hermine

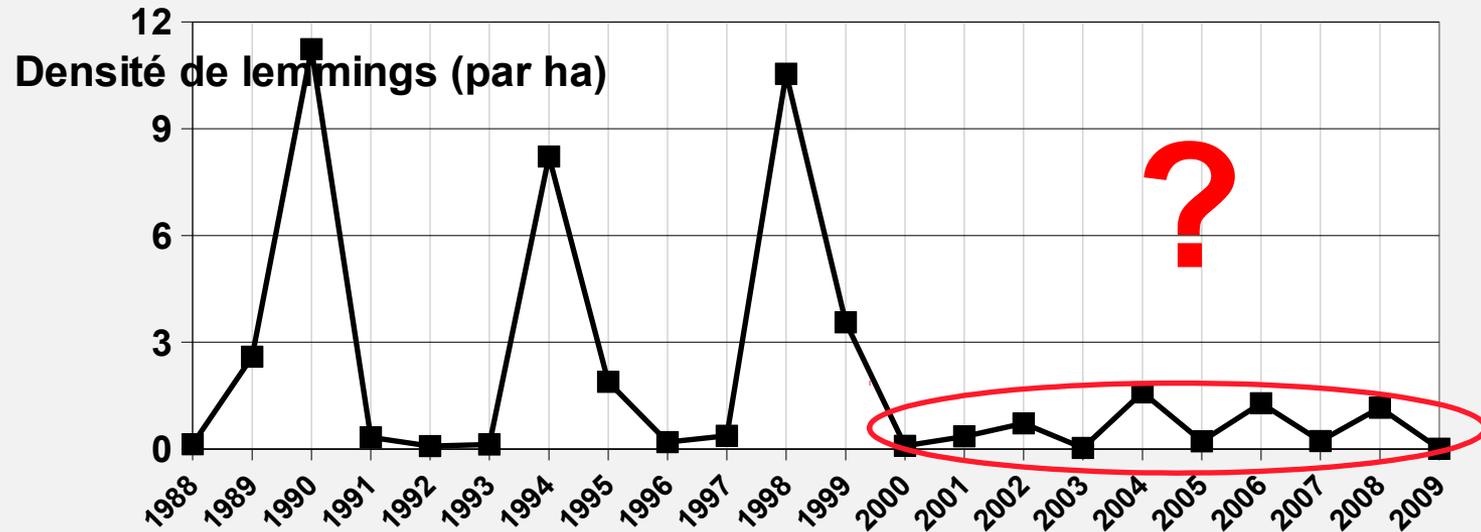
## Recherches antérieures

Après 14 années de cyclicité...



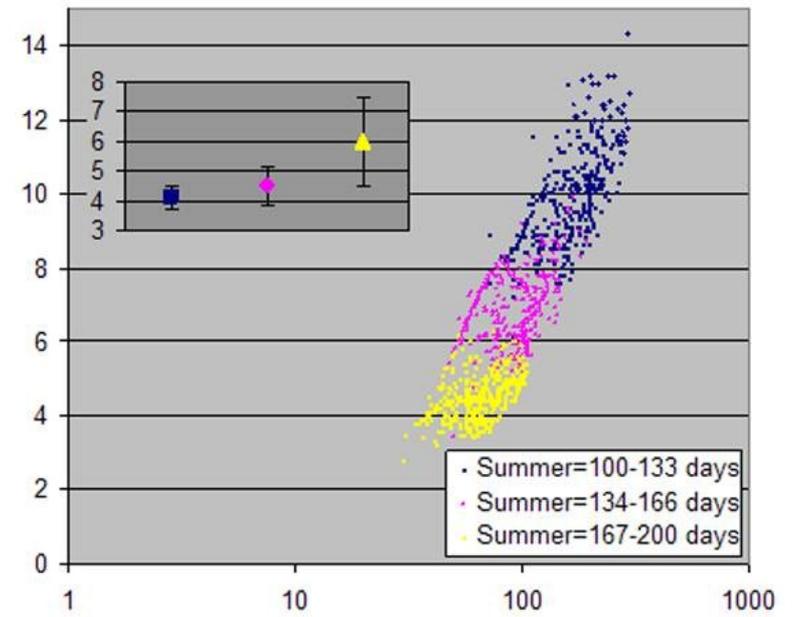
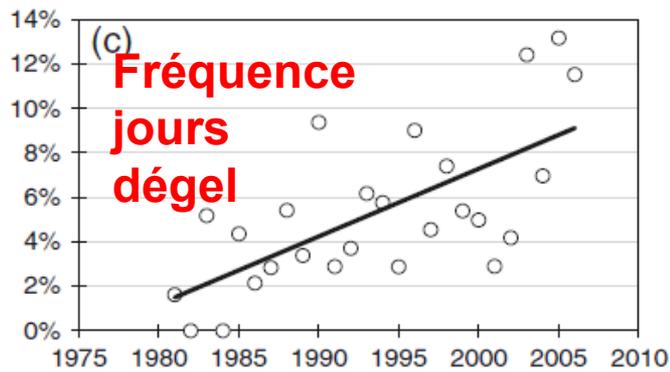
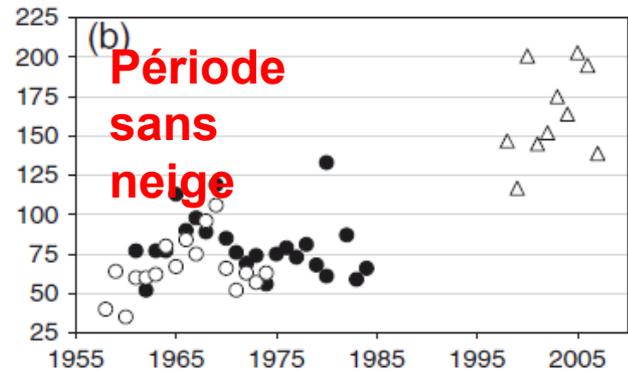
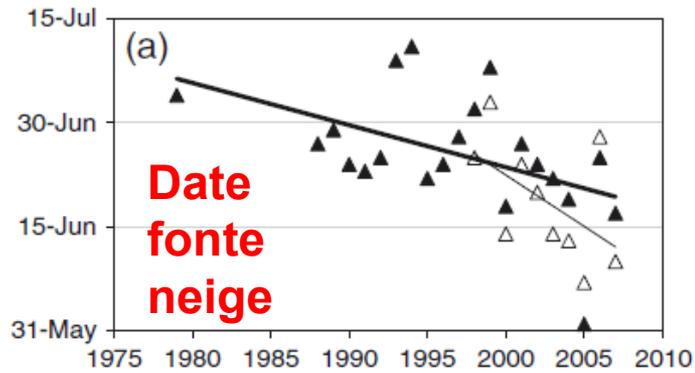
## Recherches antérieures

... la dynamique est perturbée



# Recherches antérieures

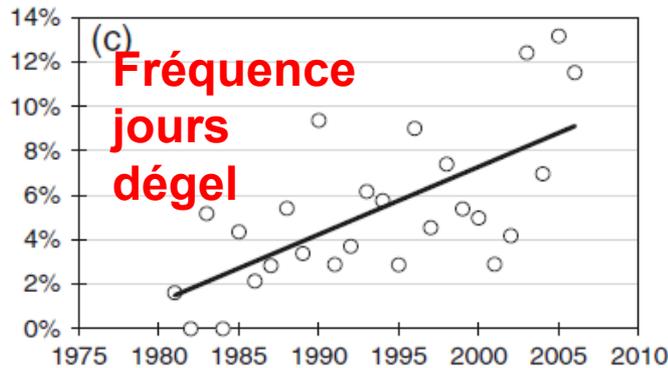
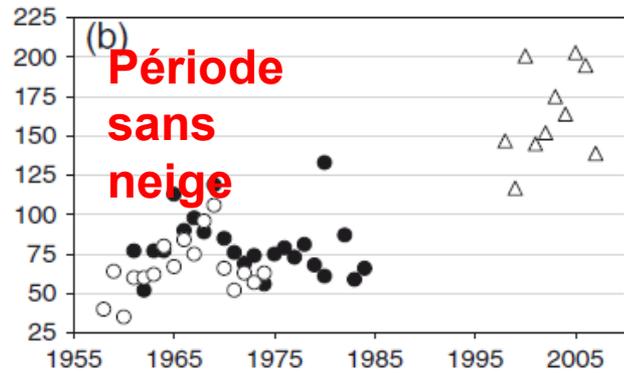
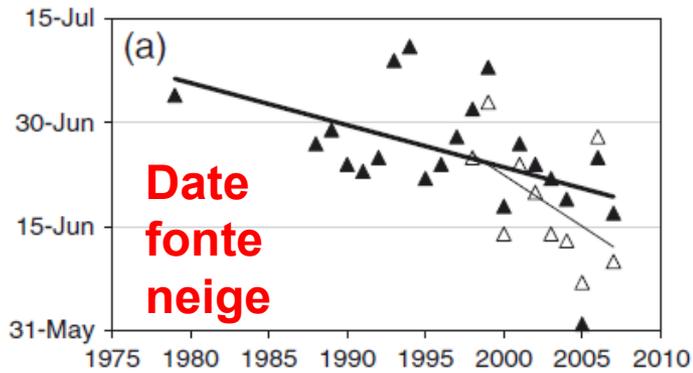
**Impact des changements climatiques sur la dynamique de la communauté ?**



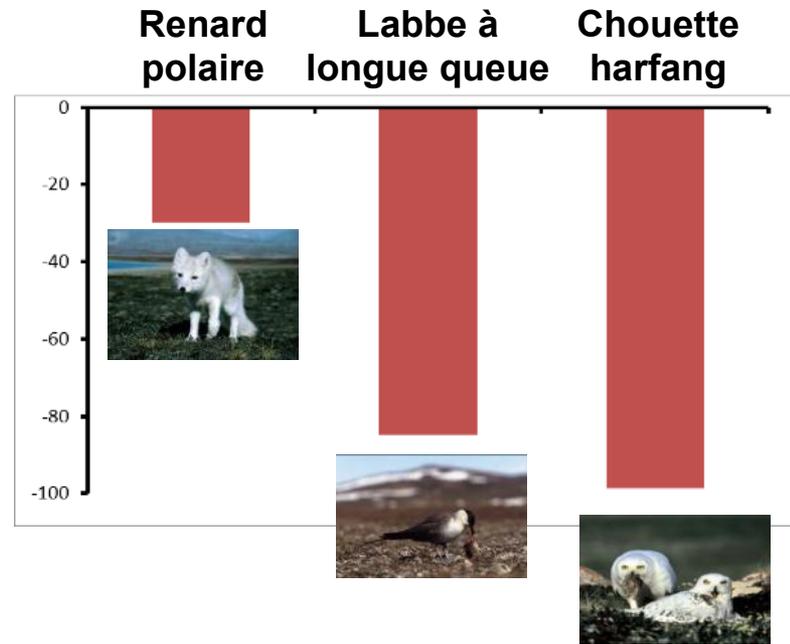
*Global Change Biol 2009 (Gilg, Siittler, Hanski)  
Ann NY Acad Sc 2012 (Gilg et al)  
Proc Roy Soc B 20012 (Schmidt et al)*

# Recherches antérieures

**Impact des changements climatiques sur la dynamique de la communauté ?**



**Baisse de productivité (>2000 vs. <2000)**



Global Change Biol 2009 (Gilg, Siittler, Hanski)  
 Ann NY Acad Sc 2012 (Gilg et al)  
 Proc Roy Soc B 20012 (Schmidt et al)

# 3. Proies alternatives, interactions indirectes et changements climatiques

Chouette harfang



Labbe à longue queue



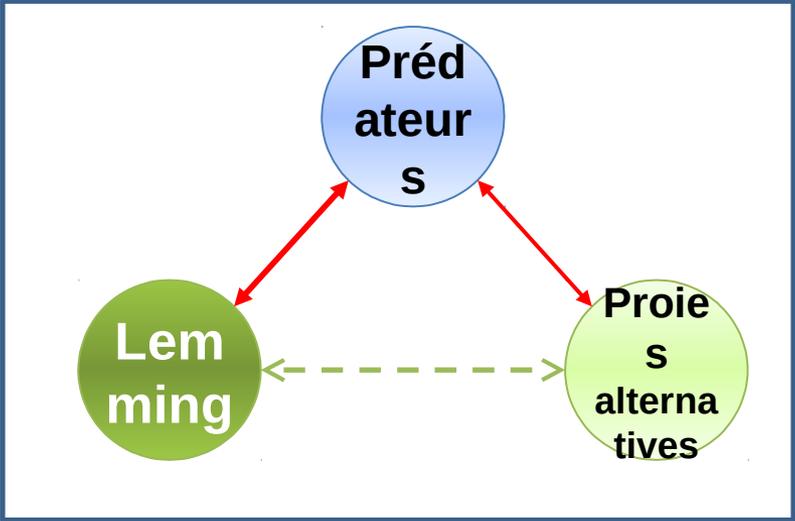
Renard polaire

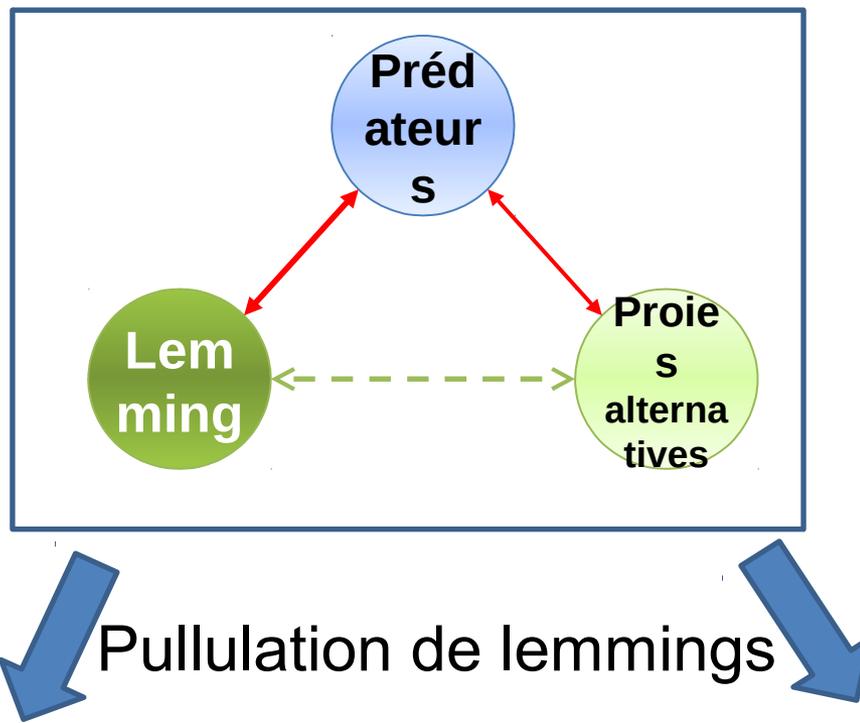


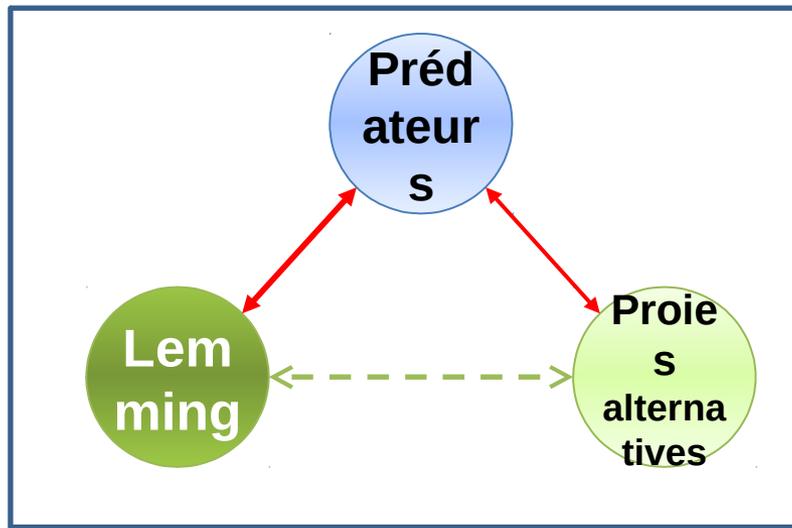
Hermine



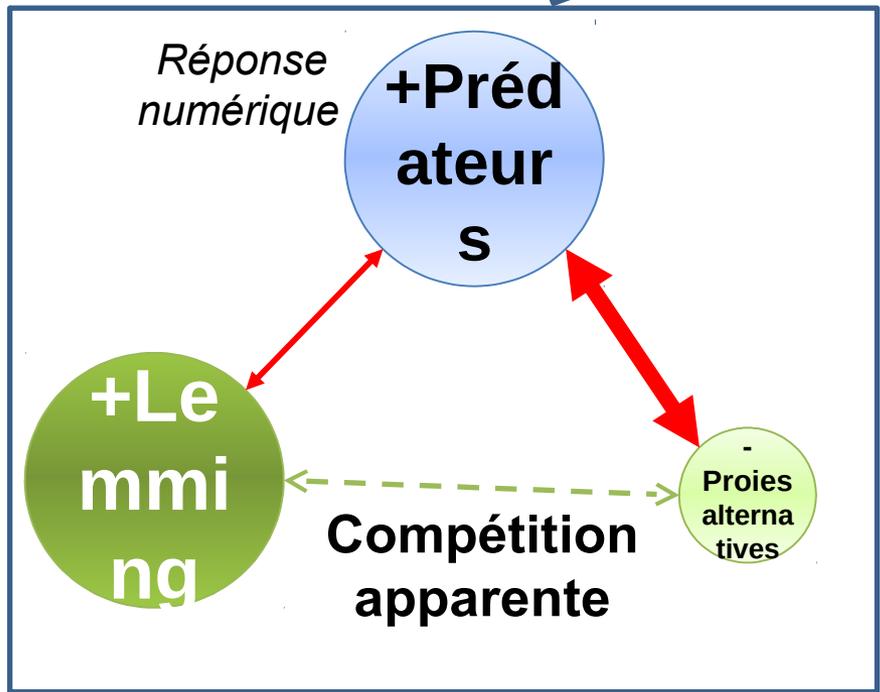
Lemming à collier

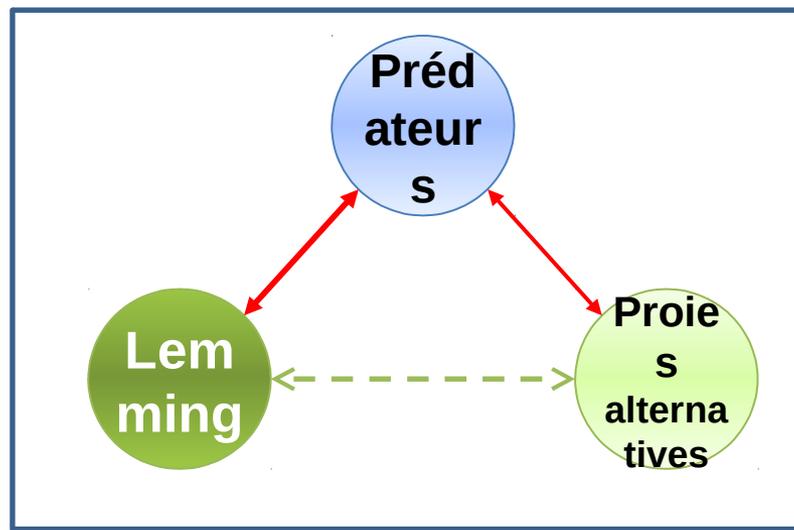




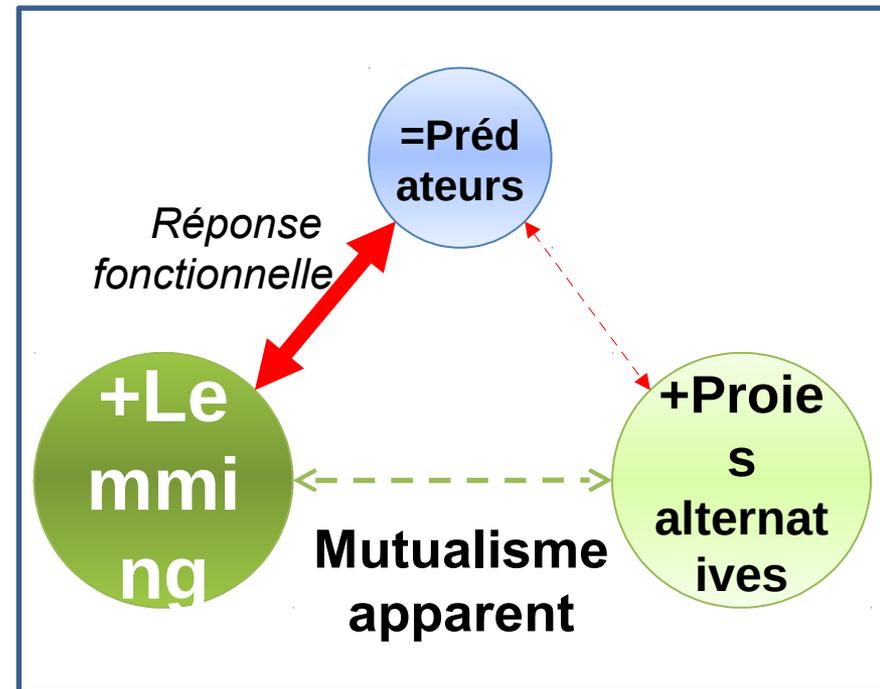
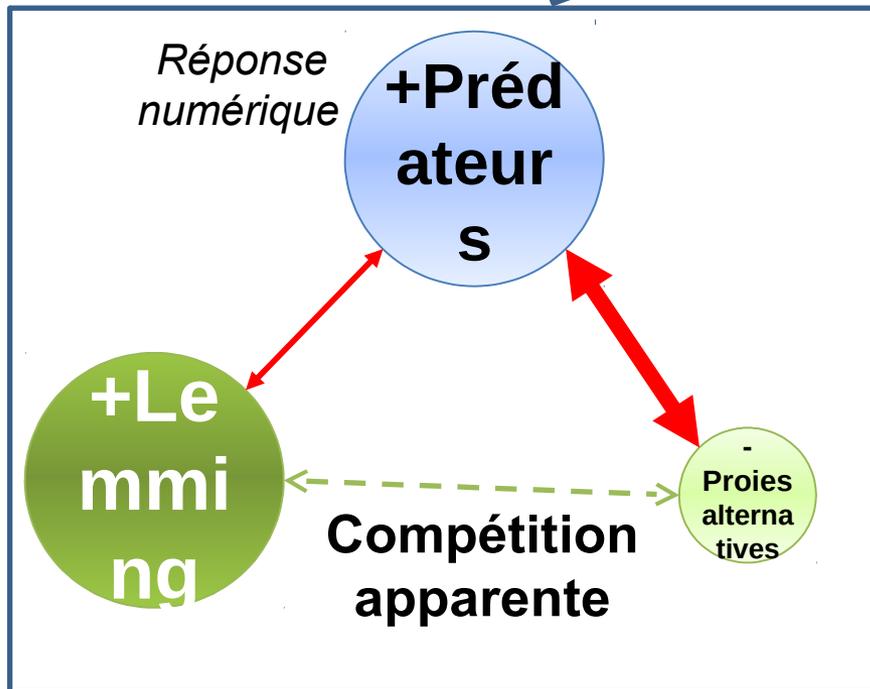


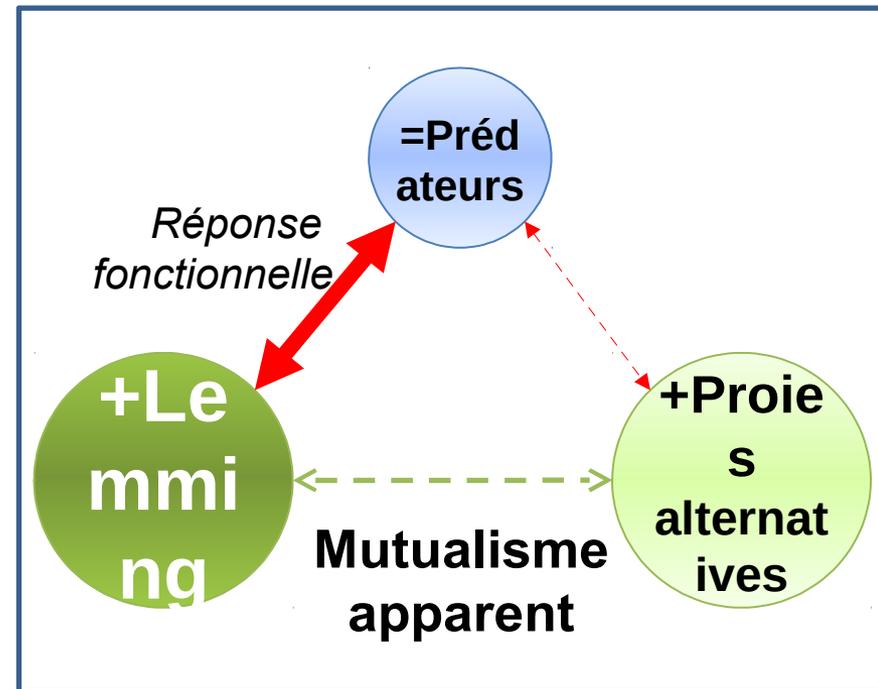
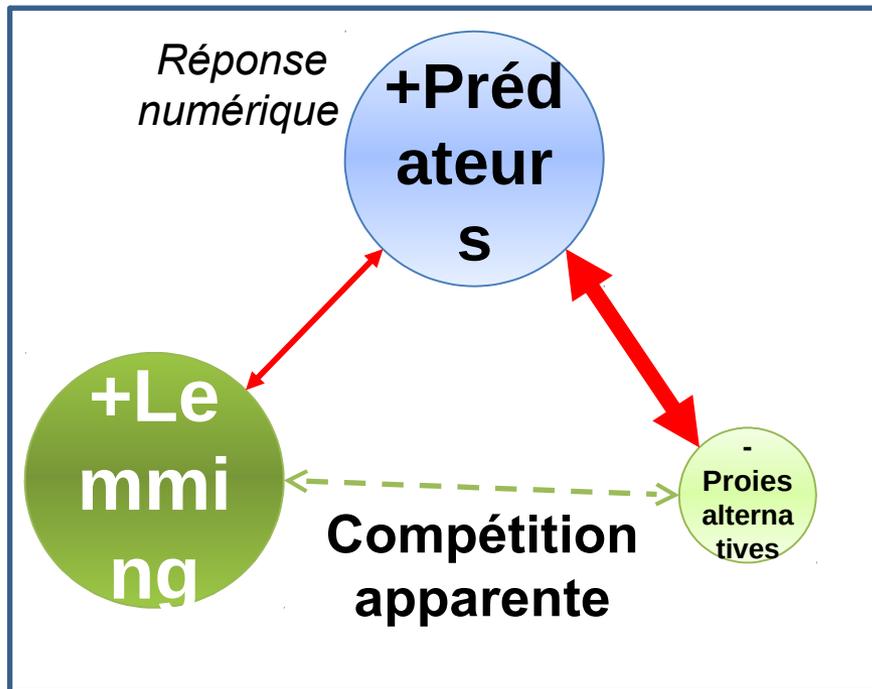
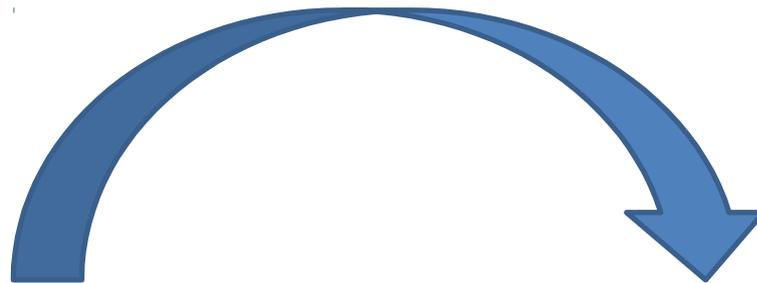
Pullulation de lemmings

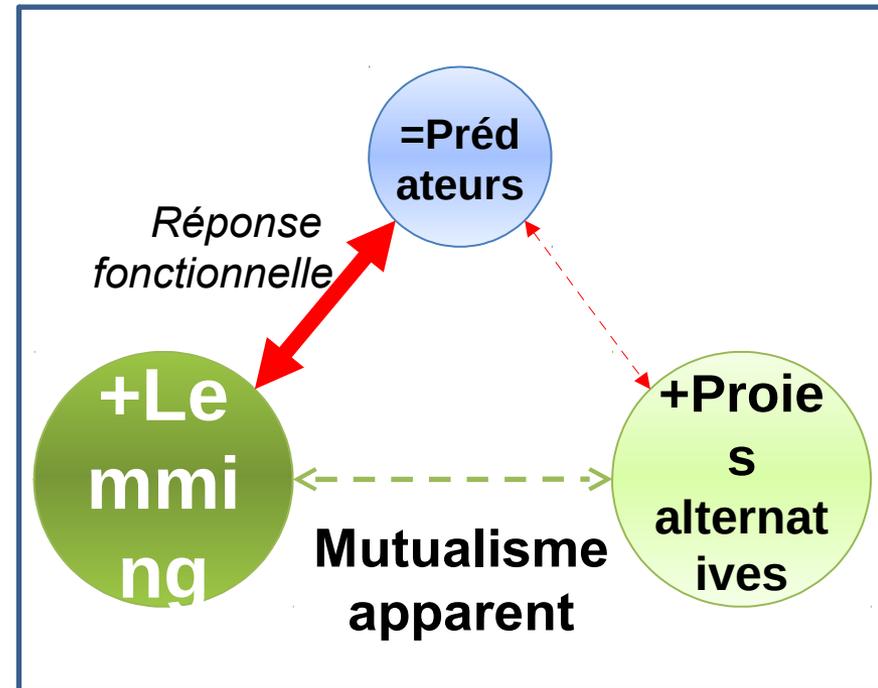
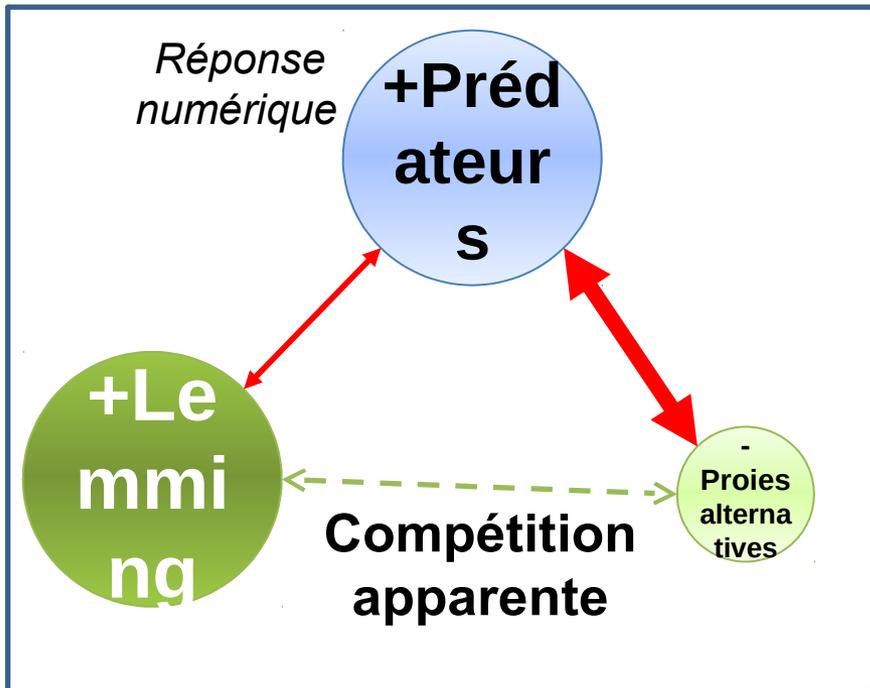
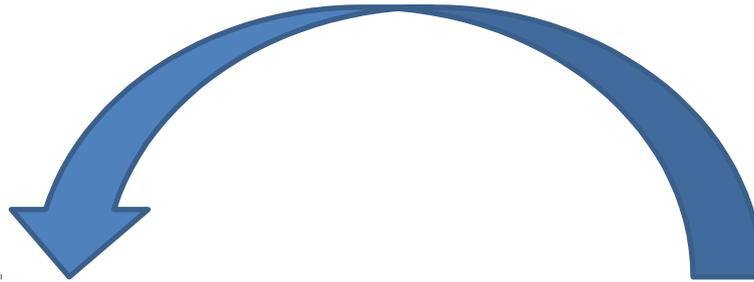


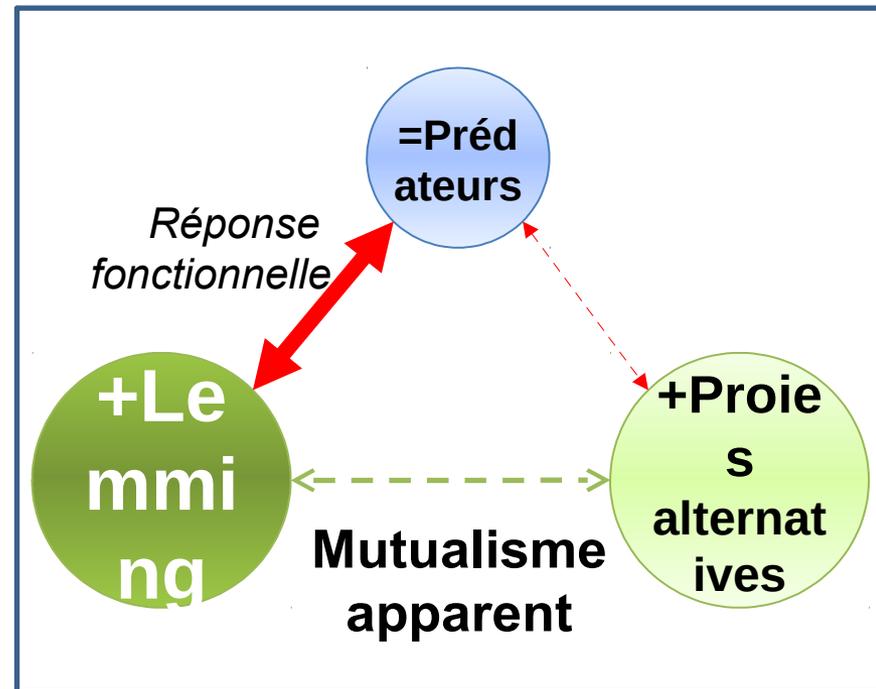
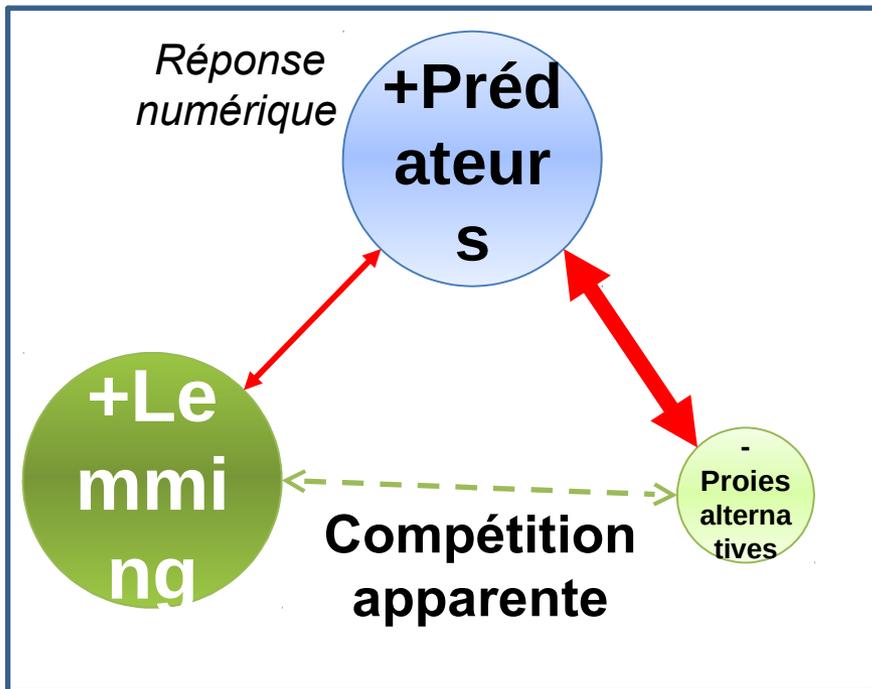


Pullulation de lemmings









## Stratégies de soins parentaux



Stratégie biparentale  
(↑ productivité)



incubation

# Stratégies de soins parentaux



Stratégie biparentale  
(↑ productivité)



incubation

Stratégie monoparentale  
(↑ survie des adultes)



# Stratégies de soins parentaux

**Pression Prédation +**



Stratégie biparentale  
(↑ productivité)

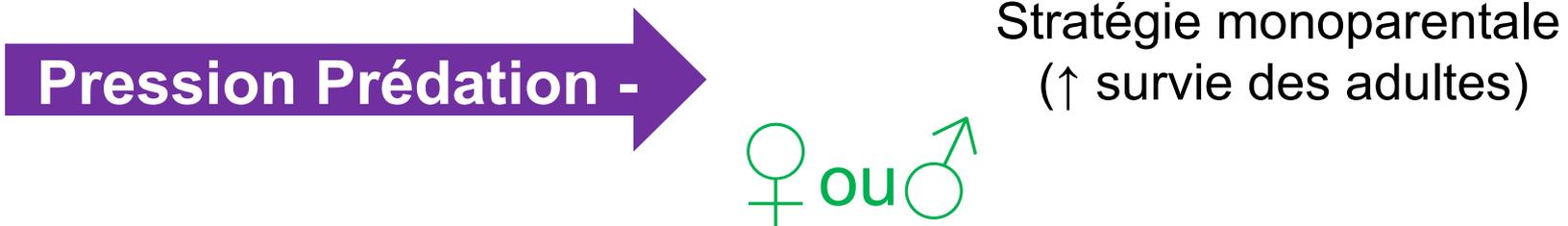
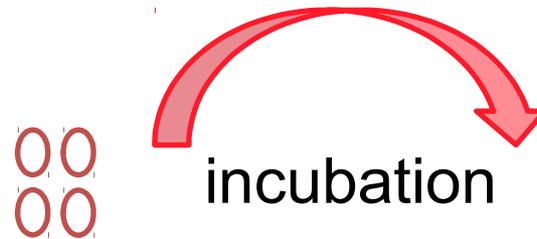
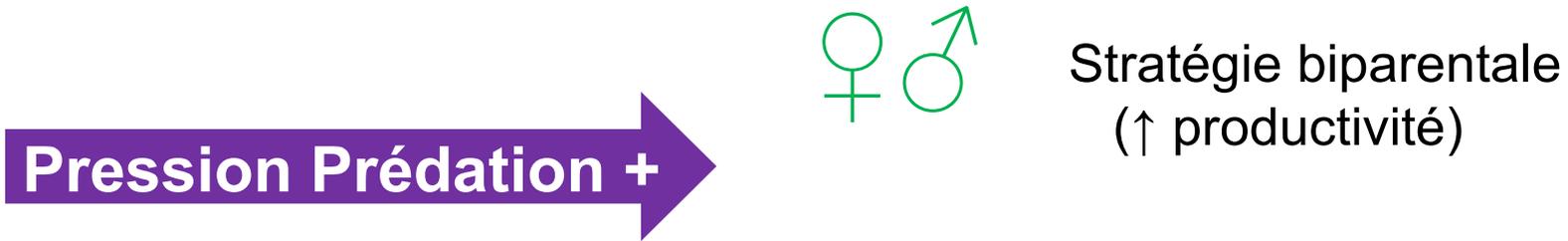


incubation

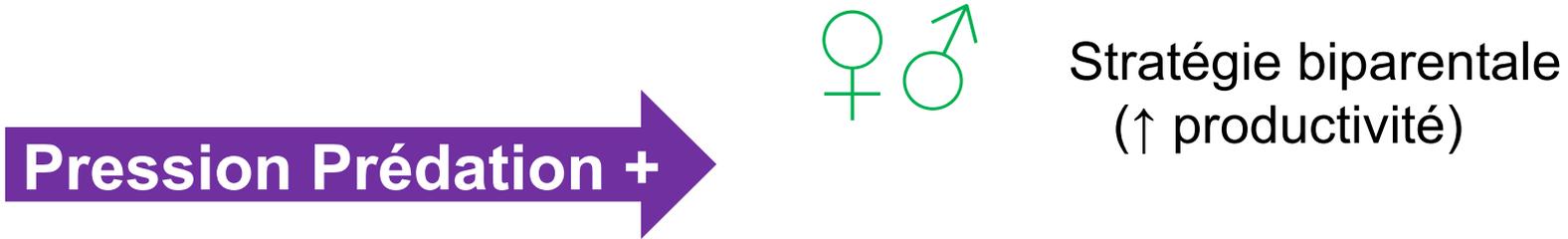
Stratégie monoparentale  
(↑ survie des adultes)



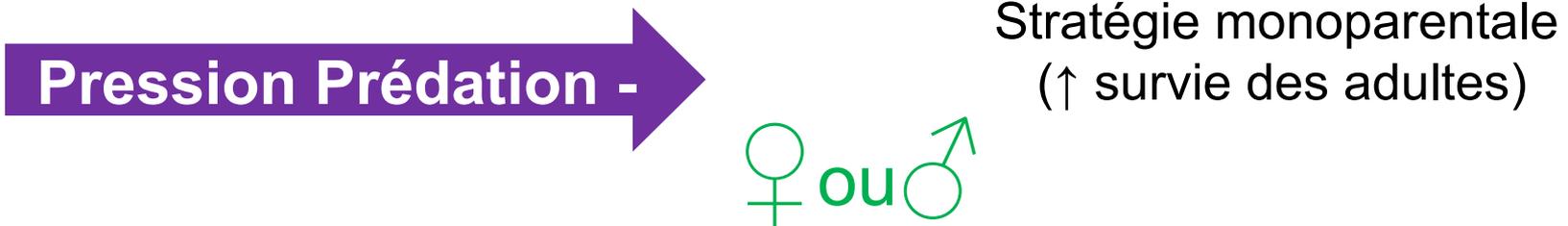
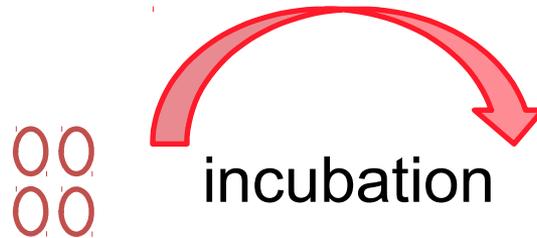
## Stratégies de soins parentaux



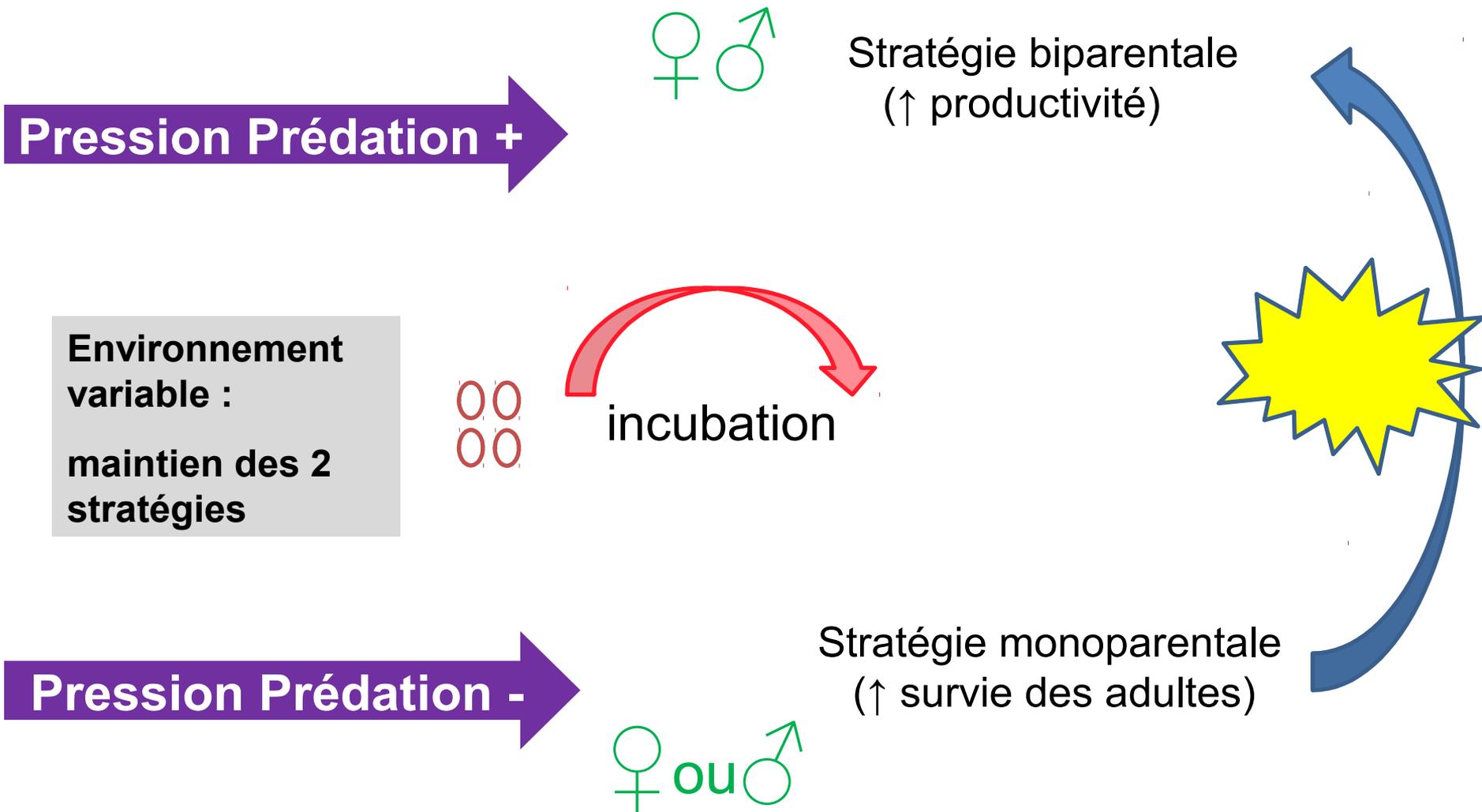
# Stratégies de soins parentaux



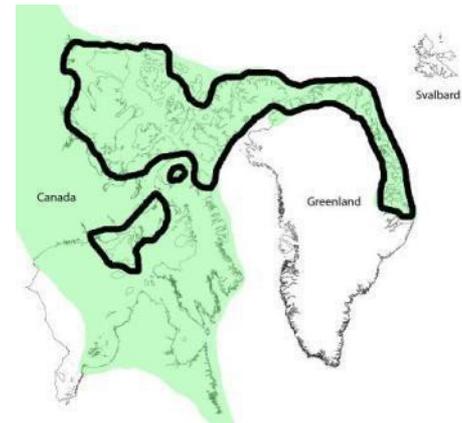
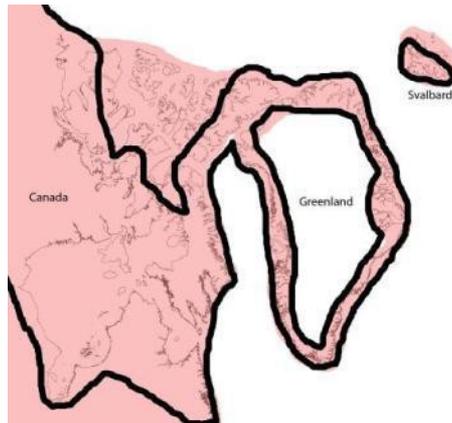
Environnement variable :  
maintien des 2 stratégies



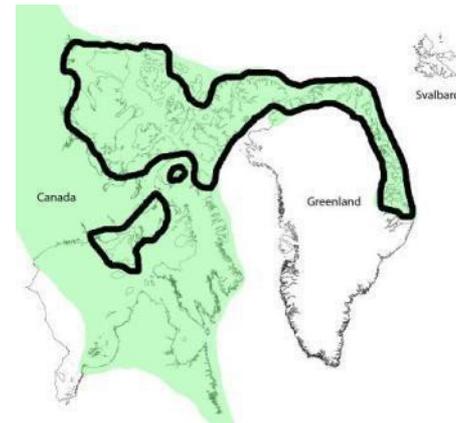
# Stratégies de soins parentaux



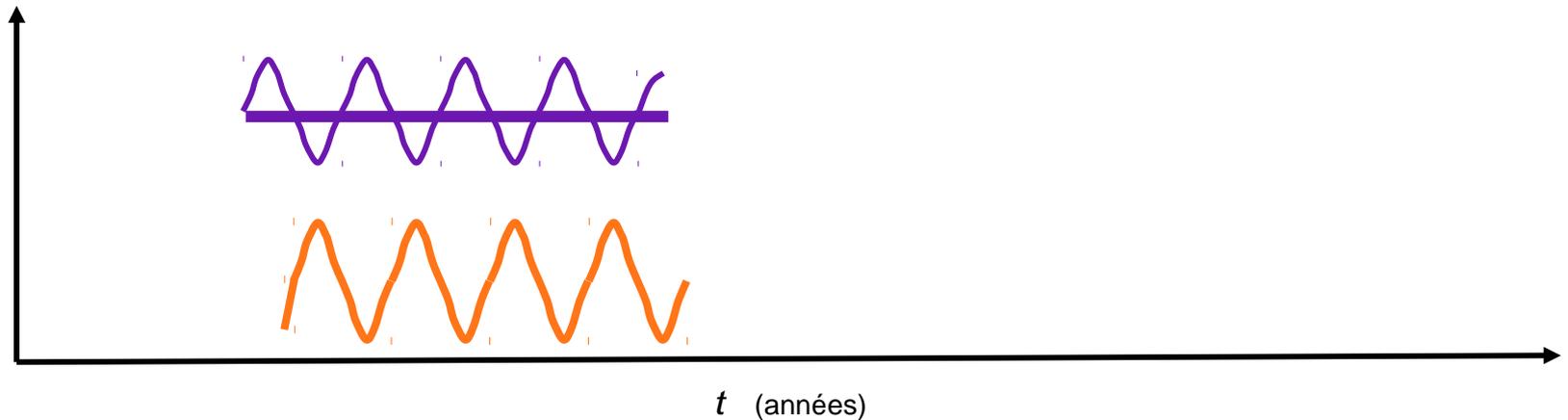
# Biogéographie « prédation – dépendante »



# Biogéographie « prédation – dépendante »



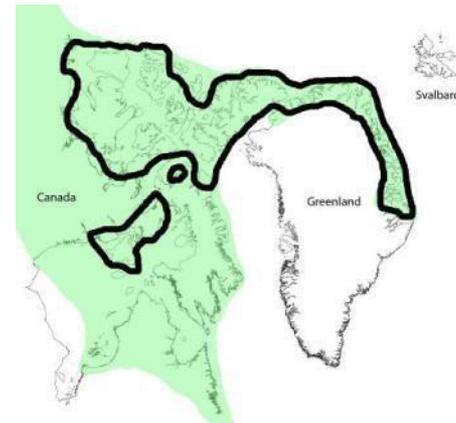
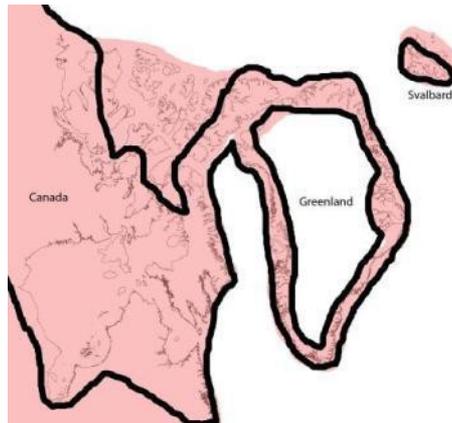
Relâchement périodique croissant de la pression de prédation



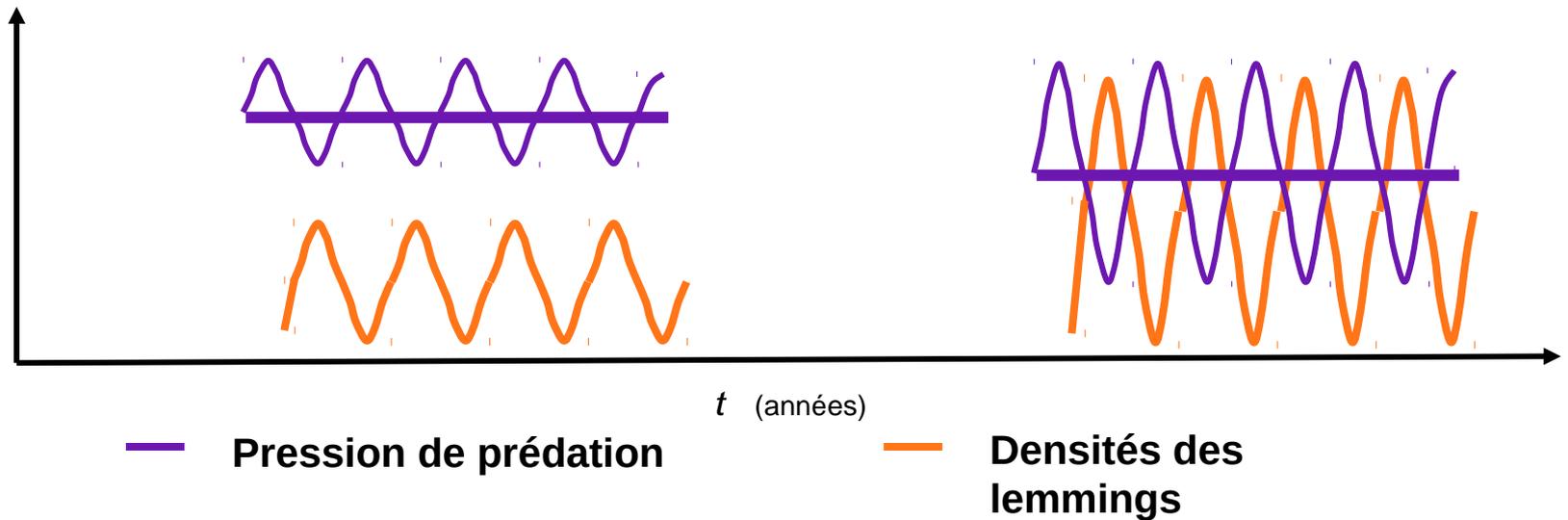
— Pression de prédation  
moyenne des prédateurs  
généralistes

— Densités des  
lemmings

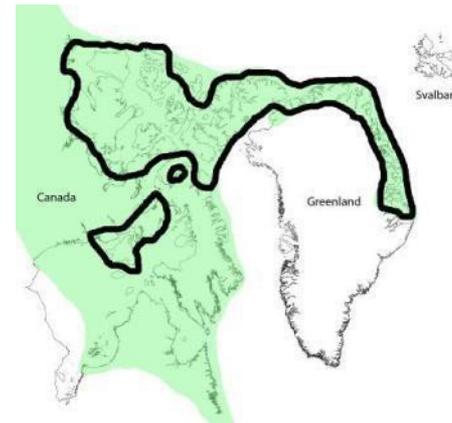
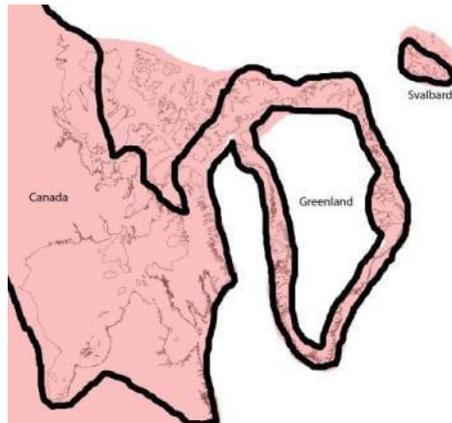
# Biogéographie « prédation – dépendante »



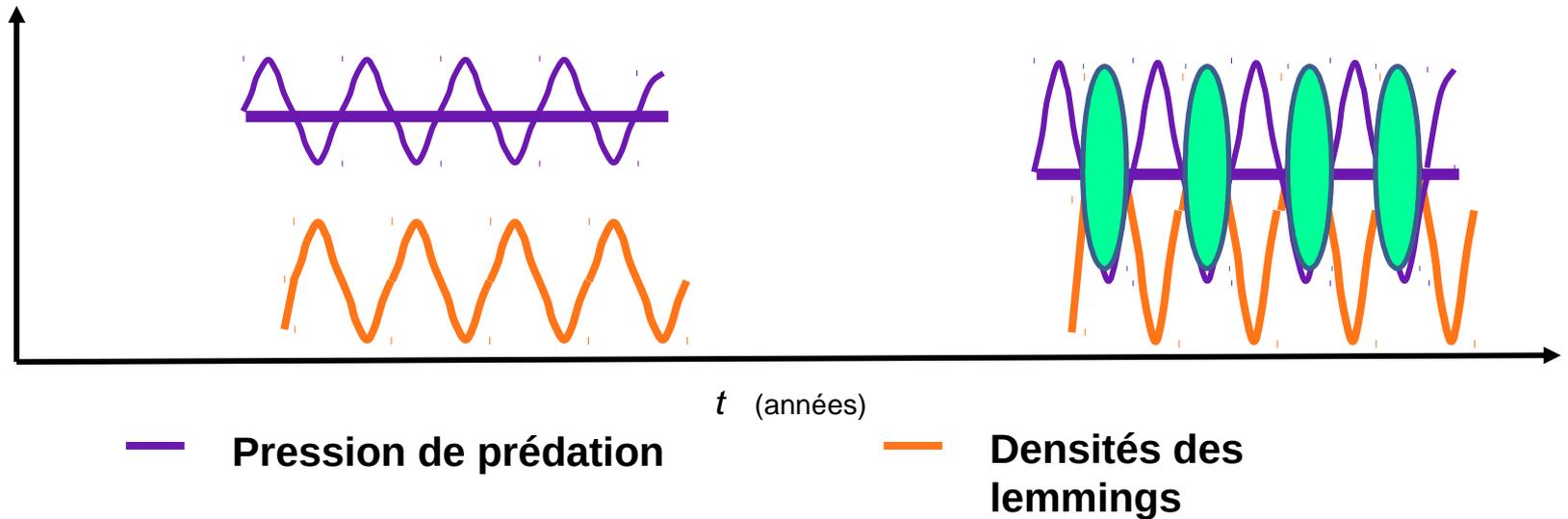
Relâchement périodique croissant de la pression de prédation



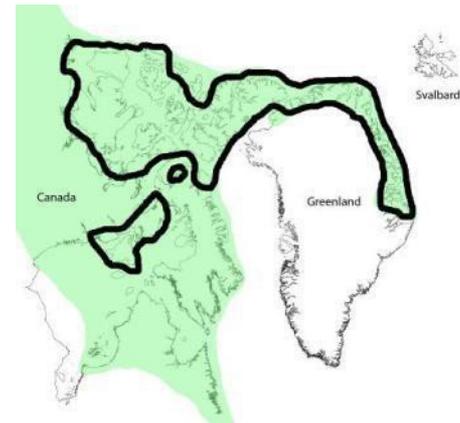
# Biogéographie « prédation – dépendante »



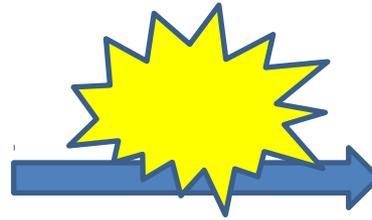
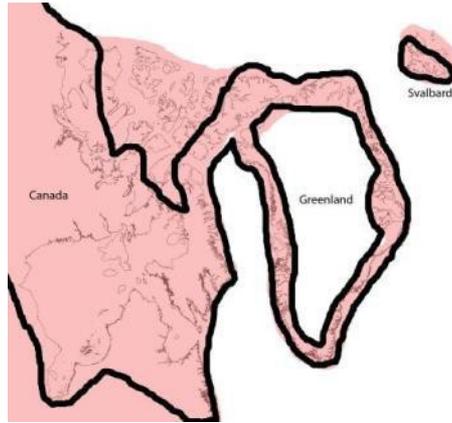
Relâchement périodique croissant de la pression de prédation



# Biogéographie « prédation – dépendante »



# Biogéographie « prédation – dépendante »



Merci !

