

## Environmental Research in Biology

### Ecology

### Genetics/Genomics



Despland  
Weladji



Brown



Marcogliese



Tsang



Martin



Albert



Dayanandan



Hickey

## Two big issues in “Environmental” Research:

- Biodiversity crisis
- Climate change

## Biodiversity: can't manage what you can't identify



## DNA Barcode Linker

Copy your DNA Barcode sequence into the box below, or try this sample.

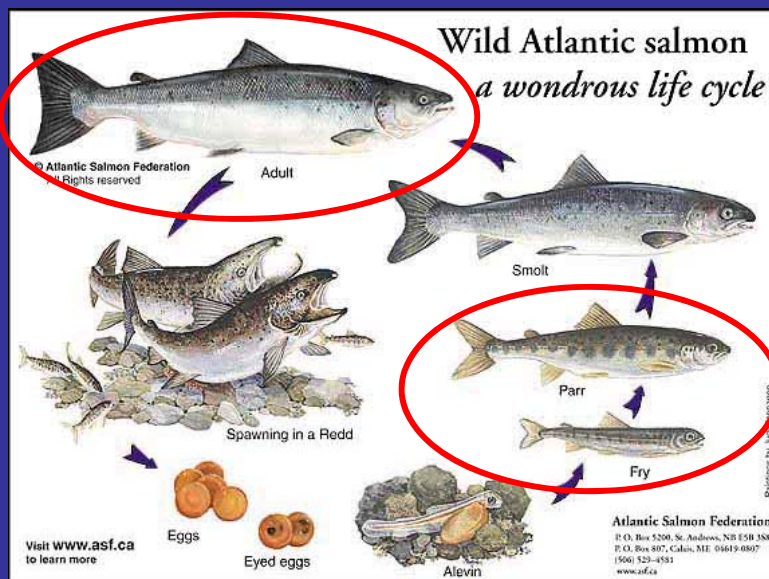
```
TATGGTAC TTATCTTC GGAGCATG AGCCGGAA TAGTAGGT ACCGCCCT TAGTCTCC TCATCCGA
GCCGAACT AGGTCAGC CTGGTTCC CTAAGTAGG AGACGACC AGATCTAC AATGTAAT 121 CGTTACAG
CCCACGCT TTTGTCAT AATCTTCT TTATAGTG ATGCCCAT CATAATTG GAGGATTG GGAAACTG ACTGGTTC
CTCTAATA ATCGGTGC TCCAGATA TGGCATTG CCACGGAT 241 AAACAACA TAAGCTTT TGACTTCT
TCCCCCTT CATTCTTC CTCTCCTT AGCCTCTT CAACGGTA GAAGCAGG GGTAGGAA CAGGATGA
ACTGTATA CCCCCAC TAGCTGGT AATCTAGC 361 CCACGCTG GAGCTTCA GTTGACCT AGCCATCT
TCTCGCTA CACCTAGC AGGTATTT CCTCCATC CTAGGGGC CATCAACT TCATTACC ACAGCAAT TAACATAA
AACCCCA GCCCTATC 481 ACAATATC AAACCTCC CTATTCGT ATGATCCG TACTAATT ACTGCAGT
ACTGCTTC TTCTTTCC CTCCCAGT CCTAGCTG CTGGTATC ACTATGCT CCTAACAG ACCGCAAC
CTAACAC
```

Your sequence matches a DNA Barcode for *Cyanocitta cristata*

Here you can find some images of *Cyanocitta cristata* using Google Images.



## Biodiversity: Atlantic salmon research



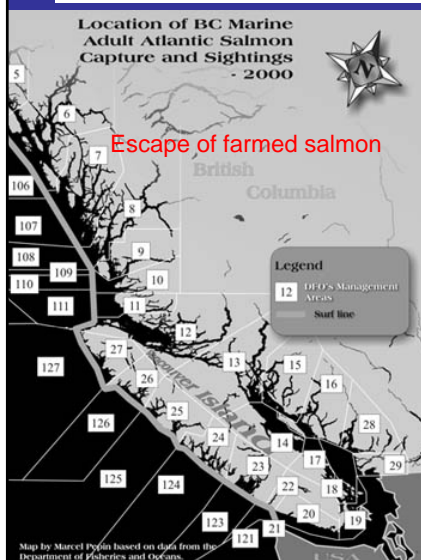
## Inner Bay of Fundy populations: endangered



### Effects of aquaculture on wild fish populations: a synthesis of data

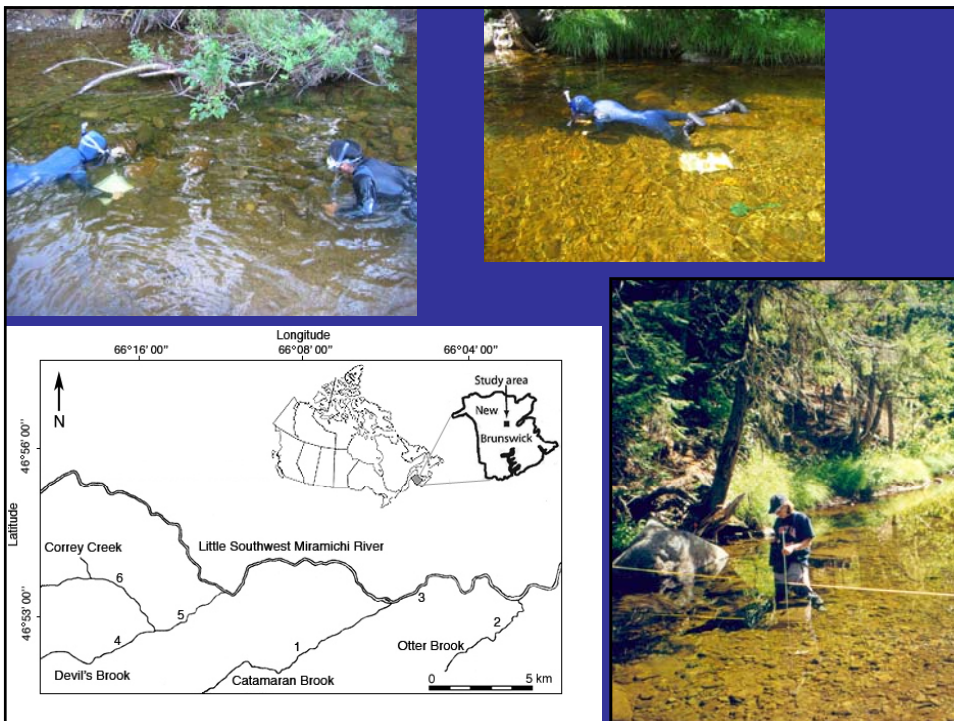
Environmental  
Reviews 13: 145-168

Laura K. Weir and James W.A. Grant



# Biodiversity: Juvenile salmon & acidification?

- Lethal effects
- Sublethal?



## Fish have adaptive anti-predator behaviour

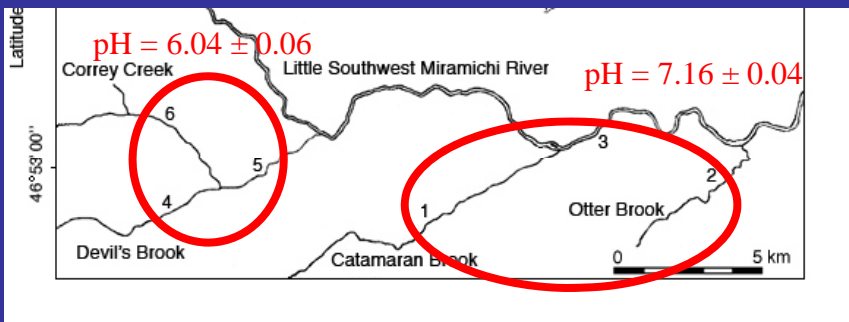
Add skin extract



## Sub-lethal effect of mild acidity

No response to alarm cues

Anti-predator behaviour



## Biodiversity: Forestry Research



Paul Albert



Emma Despland



S. Dayanandan

## Insect defoliation of forests

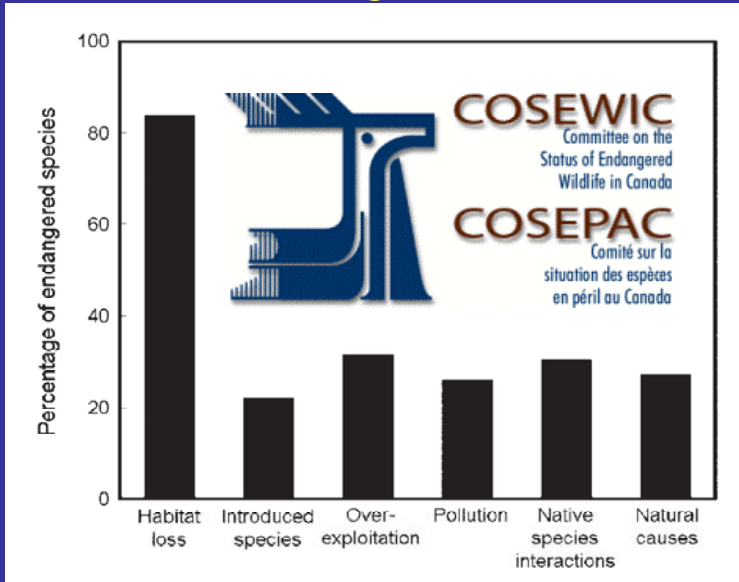
Spruce budworm damage



Forest tent caterpillars

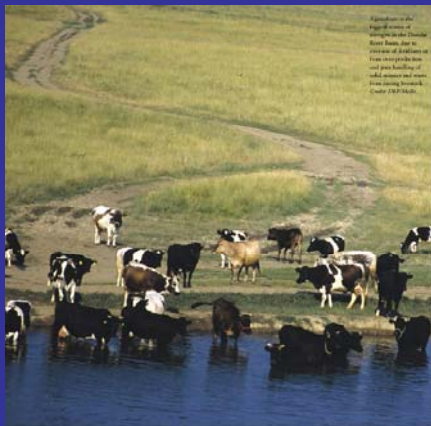


## Biodiversity: Causes of endangerment



## Human activities responsible?

46%: agriculture

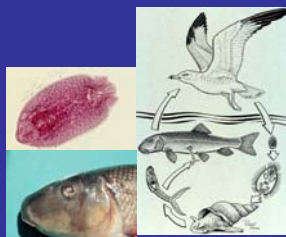


44%: urbanization



# Biodiversity: Parasites as indicators of ecosystem health and pollution status

Dr. David J. Marcogliese, Adjunct Prof.



# Biodiversity: conservation

Robert Weladji

Traditional knowledge

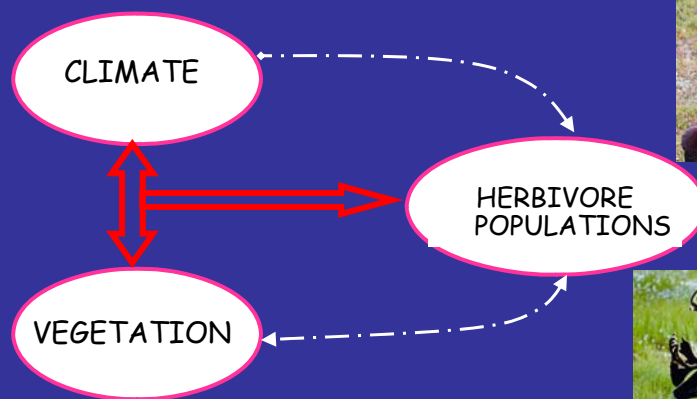


Bushmeat trade



ethnobotany

## Climate change: northern ungulates as indicator species



## Climate change: new technology via microbial engineering



Bacterial enzymes to make biofuels more efficiently



Fungal genomics: identify new enzymes to make forestry industry "greener"

## For further information?

- Jim Grant, Biology
- 3421
- [grant@alcor.concordia.ca](mailto:grant@alcor.concordia.ca)