Environmental Updates and Mysterious Deaths of 2000 Atlantic Brant Geese

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where we've just had one species die, especially in this large a number."

- Tracy Casselman, U. S. Fish and Wildlife -

Dead Atlantic brant geese collected for lab studies by U. S. Fish and Wildlife Service at Forsythe National Wildlife Refuge, Oceanville, New Jersey. Photo courtesy USFWS.

February 18, 2001 New York City - Increasing carbon dioxide and other greenhouse gases in the earth's atmosphere ARE raising the global average mean temperature, physicists say, and 100 nations have ratified the Kyoto Protocol that requires a cutback in emissions. But none of those nations are industrial like the United States, which is responsible for 25% of the world's atmospheric pollution. So far the U. S. refuses to ratify the Kyoto Protocol because American industry argues it cannot afford the economic costs of complying with emission cutbacks. This week the United Nations agreed to delay greenhouse talks until June or July, hoping for American involvement. But this delay further frustrates environmental groups who argue that President Bush was quick to create a high-level team to develop new sources of oil and other fossil fuels that will put even more CO2 into the atmosphere, while ignoring the consequences of burning fossil fuels.

While this tension about global climate change continues to fester, the U. N.'s Environment Program also announced that global warming is melting the Arctic's permafrost, causing it to release even more greenhouse gases that can further raise global temperatures. For thousands of years, Arctic soil remained permanently frozen and dead vegetation decomposed very slowly, keeping CO2 release to a minimum. But now the melting permafrost is not only releasing previously trapped gases, and is also causing serious damage to buildings, roads, pipelines and other structures in Alaska and Siberia and is threatening the existence of reindeer and polar bears.

Next month, the U. N.'s Intergovernmental Panel on Climate Change that

includes hundreds of scientists, will suggest one practical step to reducing greenhouse gas emissions. That would be for all nations to protect existing forests and to plant lots of trees which breathe in carbon dioxide and breath out oxygen. But while scientists appeal to the world to stop cutting trees and plant more, Portugal just announced a huge tree cutting project and the rainforests of Brazil and Malaysia continue to disappear at an alarming rate. Trees are also being cut down rapidly in China's Sichuan province, the only home of about 1000 giant pandas left on earth. In the past 12 years, 30% of forest areas were cleared for logging and agriculture, forcing the bamboo-eating pandas into smaller and smaller ranges. Is extinction next?

Pacific North West

Melting ice and permafrost might also be related to climate change and lack of rainfall in the northwest. Mt. Hood in Oregon has only half its normal snow depth. Snow pack is so low in Washington, Idaho, Montana, Wyoming and parts of California and British Columbia that government officials already warn of pre-drought conditions. Hydroelectric plants need lots of snowpack water to keep producing sufficient electricity in summer months for energy-starved states such as California. So, when air conditioners next turn on, there could be more rolling brown outs on the West Coast.

Then there are the mysterious die offs of animal species that raise red flags about whole ecosystems threatened like dominoes to collapsing environmental conditions that no one fully understands.

Great Lakes

One die off is happening in the Great Lakes. What is disappearing at a rapid rate are tiny shrimp-like crustaceans called diporeia. These have been a primary source of food for young fish, but now there are none in Lake Erie and the little shrimp are disappearing fast from Lakes Michigan, Ontario and Huron. One theory behind the die off is that zebra mussels got into the Great Lakes from ship ballast water and are competing too aggressively with the same food needed by the diporeia. Eventually even the trout and salmon could decline from a dwindling food chain.

Oceanville, New Jersey

Another mystery is the die off of Atlantic brant geese at the Edwin B. Forsythe Wildlife Refuge near Atlantic City, New Jersey. Wildlife experts built dikes and levies to hold fresh water in large impoundments safe from the ocean's saltwater. Scientists worldwide consider the Forsythe wetlands to be of international importance because so many birds go there for food during migrations. One of those species is Atlantic brant geese. Their total world population is only about 150,000 and they basically live on two plants: eel grass and sea lettuce. So when 2000 or more suddenly died in November and January, wild life officials were shocked and puzzled. The sanctuary is where at least 80% of the Atlantic brant geese winter each year for food and protection. Yet ironically, that's where they began to die, and were still dying three weeks ago - and still no one knows why.

This week I talked with Tracy Casselman, Deputy Project Leader for the U. S. Fish and Wildlife Service at the Forsythe Refuge in Oceanville, New Jersey.

Atlantic brant male goose courtesy feathersie@cyborganic.net.

Interview:

Tracy Casselman, Deputy Project Leader for the U. S. Fish and Wildlife Service at the Edwin B. Forsythe Wildlife Refuge, Oceanville, New Jersey:
"We didn't find any birds north of us, a few south of us, but everything seemed to be concentrated right around the impoundment.

WHICH IS IRONIC BECAUSE THE IMPOUNDMENT WAS DESIGNED SPECIFICALLY TO PROTECT THE BIRDS AND PROVIDE FEED FOR THEM.
Right. And when you are a manager of a facility like this and you spend a whole year to get the impoundment in shape for birds that migrate and they come down and start dying, it really takes you aback. It's really a strong impact when you are spending day after day picking up dead birds out of this impoundment that should have healthy feeding birds.

SYMPTOMS?
What I've seen with these birds is that when they get sick, they seem to isolate themselves from the flock probably because they can't keep up or perhaps because they can't handle the pecking order. They tend to swim off by themselves which brant do not do. They are a very gregarious species this time of year. But these (sick) birds isolate themselves. They swim around and towards the end of their life, they may swim in circles. They may swim up against the bank and just paddle in place like they are trying to go somewhere, but the bank is stopping them. Sometimes they flap their wings. Sometimes they will flop their heads from side to side. And then they just usually seem to slump over.

THERE IS DISORIENTATION?
There definitely seems to be disorientation and loss of muscle coordination. Definitely.

IT SUGGESTS THAT SOMETHING IS AFFECTING THE BRAIN AND NERVOUS SYSTEM?
Right. That's correct.

HOW DO YOU INVESTIGATE TO FIND OUT WHAT IS CAUSING THE SYMPTOMS?
When you see a large number of one species drop very quickly, the first thing that comes to most peoples' mind is that they got into some type of pesticide when they were feeding that really knocked them off. We tested for the common pesticide applied to lawns and fields and we found no signs of that. We also looked at other things such as rodenticides and rat poisons and they came up with nothing there.

When the second outbreak occurred, they had already looked for the common things. We started spreading things out even thinner, collecting water samples, vegetation samples, mud samples. We started looking more at what we were finding in the stomach channel of these birds and we were finding they weren't eating much which indicated to us that they weren't dying within a couple of hours. It was something that was taking 6 to 8 hours, maybe up to 24-48 hours. These birds are also very healthy. They had good amounts of body fat. So it's not something that is affecting them today and they are dying 2 weeks later because they have good healthy fat reserves. If it was something that was taking 2-3 weeks to process through their system, we would see a rapid loss of body fat.

WHICH AGAIN FOCUSES ON THE REFUGE IN SOME FUNNY WAY THAT WHATEVER THEY ARE EATING THERE OR WHATEVER IS THERE, IF IT IS AN IMMEDIATE KIND OF IMPACT ON THEM, IT SEEMS IT'S HAPPENING AROUND THE REFUGE?
Well, that's correct. And that's why we started looking at plant samples and water samples and vegetation and mud samples in the areas where they were feeding and where we were finding them dead.

WHAT ABOUT INTERNAL ORGANS?
Their internal organs were what we looked at initially when we suspected things like avian cholera. We were finding some hemorrhaging of blood vessels in the heart. We were finding little necroses in the liver. That's one of the things you see with avian cholera, but we didn't see some of the other things we should have seen. And when we tried to isolate the bacteria and culture it, we were not able to do it. If it had been avian cholera, there would have been thousands upon thousands of bacteria in these birds and you would be able to culture very easily.

COULD YOU EXPLAIN WHAT SEEMS TO ME A VERY ODD MYSTERY THAT ONLY THE BRANT GEESE SEEM TO BE DYING AND YET YOU HAVE A REFUGE WITH ALL THESE OTHER BIRDS?
If I could explain that I would probably be about 90% to the answer of why the brant are dying. We don't know. We're starting to focus on what brant do differently than the rest of the waterfowl species. Where do they go that the other waterfowl don't go. What are they feeding on? What is happening to them that doesn't happen to black ducks and Canadian geese and mallards and pintails and green wing teal and shovelers? There is some overlap in where these birds go and where they feed. And that is the biggest mystery. In talking with Dr. Kimberly Miller who is the disease specialist from the Madison lab that is working with us on this and all the other folks, they can't remember ever seeing a situation like this where we've just had one species die, especially in this large a number.

Occasionally, you see 20 or 30 birds die all of one species, but when you see 2000 die and you're only looking at one species, that is a big part of the mystery. I think if I knew the answer to that I would probably have the key to solving the whole thing. And we don't. So we focused more on what they are feeding on and where they've been, what they are doing, to try to key in on this. To this day we have not been successful.

COULD THERE BE ANY LINK TO GLOBAL WARMING CHANGES?
I think we're going to find out, if we ever find the answer to this, is that there is probably more than one causative agent. The folks doing the histological and virology are convinced that the birds are suffering from some type of infectious disease based on the hemorrhaging of the heart, some of the thinning of the blood vessels and some of the things they are seeing. But that alone doesn't explain the massive mortality and it doesn't explain why it isn't being passed from one water fowl species to another. So, my speculation is that we're going to find more than one causative agent. And that's probably why we haven't been

able to pinpoint it now at this point. If it were one disease that was knocking them back, I think we would probably have isolated it. It's possible that these birds have an infectious disease and something in the environment is just putting them over the edge. But we don't know. Why did it happen over Martin Luther King weekend? Why did it seem to stop when it got cold in November and flare up again when we had the first 40 degree day? We don't know. These are all small pieces of the puzzle we are trying to assemble to come up with the big picture and hopefully the key as to the cause.

IS ANYBODY AWARE OF ANY SPECIFIC DIE OFF OF BRANT GEESE LIKE THIS SEPARATE FROM OTHER BIRD POPULATIONS AT ANY OTHER TIME IN THE HISTORY OF OUR COUNTRY?
No. No. We've even looked broader than the U. S. There are several international websites where we posted information and we've gotten a little bit of feedback from the French that have seen some die offs of geese due to a virus and we passed that info along to the Madison lab virologist. But that was with a different species of geese and it seemed to cover more than one species at a time when they saw it.

THIS IS A UNIQUE EXPERIENCE IN THE HISTORY OF ORNITHOLOGY?
You could say that. Unfortunately, it's not a positive unique experience."

More Information:

The sanctuary's impoundment water where most of the brant geese died is dominated by sea lettuce. So Tracy Casselman and his U. S. Fish and Wildlife colleagues continue to sample the plants and water for signs of any unusual substances. Also, many laboratories are now involved, including the Madison, Wisconsin Wildlife Disease Lab, the Department of Agriculture, Southeast Cooperative Disease Control and the National Oceanic and Atmospheric Administration. All are trying to figure out what is killing the Atlantic brant geese.

If anyone finds a dead goose on the New Jersey coast, please call the Forsythe National Wildlife Refuge at 609-652-1665.

Websites:

http://www.greatnorthern.net/~dye/featured.html

http://www.fws.gov/

http://www.usgs.gov/

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