MID-CONTINENT LIGHT GEESE

OVERSIGHT HEARING

BEFORE THE

SUBCOMMITTEE ON FISHERIES CONSERVATION, WILDLIFE AND OCEANS

OF THE

COMMITTEE ON RESOURCES
HOUSE OF REPRESENTATIVES

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OVERSIGHT HEARING ON MID-CONTINENT LIGHT GEESE

THURSDAY, APRIL 15, 1999

HOUSE OF REPRESENTATIVES,
SUBCOMMITTEE ON FISHERIES CONSERVATION,
WILDLIFE AND OCEANS,
COMMITTEE ON RESOURCES,
Washington, DC.

The Subcommittee met, pursuant to notice, at 11 a.m., in Room 1324, Longworth House Office Building, Hon. Jim Saxton [chairman of the Subcommittee] presiding.

STATEMENT OF HON. JIM SAXTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Mr. SAXTON. The Subcommittee on Fisheries Conservation, Wildlife, and Oceans will come to order.

Today, the Subcommittee will conduct an oversight hearing on the impact that light geese are having on the fragile Canadian Arctic tundra. We will examine the likely effectiveness of two rules that the U.S. Fish and Wildlife Service has recently issued to address this impact, and we will inquire whether additional population control measures may be necessary in the future.

The U.S. Fish and Wildlife Service has been monitoring light geese populations for over 50 years. During this time, the population has increased from 800,000 birds in 1969 to over 5 million mid-continent light geese today. It is projected that the breeding population could rise to more than 6.8 million in the next 3 years.

These birds are world-class foragers, and their favorite foods are found in the 135,000 acres that comprise the Hudson Bay lowland salt-marsh ecosystem. In fact, they like this vegetation so much that they are eating it much faster than its ability to regrow. According to various scientists, one-third of the lowlands have been destroyed, one-third are on the brink of destruction, and the remaining one-third are being consumed by the ever-expanding population of these geese.

While a solution to the overpopulation problem will not be easily found, there are certain undeniable facts. It is clear that man created the problem by planting thousands of acres of cereal crops, and unless some management practices are implemented, the destruction of the Arctic tundra will continue in the future.

On February 16th, the U.S. Fish and Wildlife Service issued two final rules to reduce the population of Mid-Continent light geese. At that time, the Director of the Service stated that, quote, "We are not ruling out any other solutions that could help solve this prob-

lem and ensure healthy population levels." I am interested in learning what additional steps may be contemplated; what is a healthy population level for this species, and how quickly will the tundra recover if foraging pressure is reduced?

I look forward to hearing from our distinguished witnesses on how we should address these serious environmental problems.

[The prepared statement of Mr. Saxton follows:]

STATEMENT OF HON. JIM SAXTON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Good morning. Today the Subcommittee will conduct an oversight hearing on the impact that light geese are having on the fragile Canadian Arctic tundra. We will examine the likely effectiveness of two rules that the U.S. Fish and Wildlife Service has recently issued to address this impact, and we will inquire whether additional population control measures may be necessary in the future.

The U.S. Fish and Wildlife Service has been monitoring light geese populations for over 50 years. During that time, the population has increased from 800,000 birds in 1969 to more than five million Mid-Continent light geese today. With a 10 percent growth rate, it is projected that the breeding population could rise to more than 6.8 million birds in the next three years.

These birds are world-class foragers, and their favorite foods are found in the 135,000 acres that comprise the Hudson Bay lowland salt-marsh ecosystem. In fact, they like this vegetation so much that they are eating it much faster than its ability to regrow. According to various scientists, one-third of the lowlands have been destroyed, one-third are on the brink of devastation, and the remaining one-third are being consumed by an ever-expanding population of light geese.

While a solution to this overpopulation problem will not be easily found, there are certain undeniable facts. It is clear that man created this problem by planting thousands of acres of cereal crops and, unless some management policies are implemented, the destruction of the Arctic tundra will continue unabated and dozens of species, including light geese, will be unable to live there in the future.

On February 16th, the U.S. Fish and Wildlife Service issued two final rules to reduce the population of Mid-Continent light geese. At that time, the Director of the Service stated that "we are not ruling out any other solutions that could help solve this problem and ensure healthy population levels in the future." I am interested in learning what additional steps may be contemplated, what is a healthy population level for this species, and how quickly will the tundra recover if foraging pressure is reduced.

I look forward to hearing from our distinguished witnesses and I am anxious to hear the various recommendations on how to address this serious environmental problem.

[The prepared statement of Mr. Young follows:]

STATEMENT OF HON. DON YOUNG, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF ALASKA

Mr. Chairman, I compliment you for holding this oversight hearing on the destruction of the Canadian Arctic tundra by a growing population of light geese.

Three years ago, the U.S. Fish and Wildlife Service joined with the Canadian Wildlife Service, Ducks Unlimited, the National Audubon Society, and several state fish and game departments in forming the Arctic Goose Habitat Working Group. After carefully studying the problem, a report entitled "Arctic Ecosystems in Peril" was released.

While there are many recommendations in this report, the bottom line is that immediate steps must be taken to reduce the population of Mid-Continent light geese.

This population has exploded from 800,000 in 1969 to more than five million birds today. The fundamental cause of this dramatic increase is the expansion of agricultural areas and the abundance of food for these geese. In Arkansas, Louisiana and Texas alone, there are more than 2.25 million acres of rice farms that have become a buffet bar for these birds.

With this improved diet, these geese are living longer and reproducing at about 10 percent each year. As a result, the 135,000 acres of the Hudson Bay lowlands ecosystem are being systematically destroyed. What was once thickly vegetated marsh is rapidly becoming a virtual desert that will no longer sustain life. This fragile Arctic habitat recovers extremely slowly and unless this population is signifi-

cantly reduced, dozens of species, including light geese, will not survive in the future.

In an effort to address this escalating problem, the U.S. Fish and Wildlife Service has issued two final rules to slow the destruction of the Arctic tundra. These rules, which allow for expanded hunting opportunities, were drafted after a long and difficult process. More than 1,100 comments were considered and the rules are fully consistent with the recommendations of the Arctic Goose Habitat Working Group.

While the rules by themselves will not save the ecosystem, they are a responsible step in the right direction. This is a problem created by man, and the Service should be commended for its leadership in this matter. The easy decision would have been to do nothing. After all, some might say this is a Canadian problem. However, to endorse the idea of simply allowing nature to run its course, to allow the population of light geese and dozens of other species that depend on this habitat to crash is irresponsible. We cannot sit idly by and allow this environmental catastrophe to occur.

I look forward to hearing from our distinguished witnesses and to working together to solve this problem of an overabundance of Mid-Continent light geese.

Mr. SAXTON. In as much as the Ranking Member is not here, I guess I would ask if any other members have statements? Okay.

I ask unanimous consent that all Subcommittee members be permitted to include their opening statements in the record.

[The prepared statement of Mr. Faleomavaega follows:]

STATEMENT OF HON. ENI F. H. FALEOMAVAEGA, A DELEGATE IN CONGRESS FROM AMERICAN SAMOA

Thank you and good morning Mr. Chairman. Before we begin I would like to extend a welcome to our assembled witnesses here this morning, and especially, I would like to thank Dr. Vernon Thomas and Dr. Robert Alison who have traveled from Ontario, Canada to be with us today. I look forward to hearing from both of you.

I commend Chairman Saxton for the timeliness of today's oversight hearing. I am sure that several members of this Subcommittee were interested in the Fish and Wildlife Service's decision earlier this month to withdraw final rules designed to remedy the ongoing destruction of arctic and subarctic breeding habitats caused by the population surge of mid-continent light geese.

I am inclined to agree with Judge Thomas Hogan's recent decision that found that the Fish and Wildlife Service had acted within its authority under the Migratory Bird Act Treaty to invoke emergency measures to protect migratory birds. I sympathize with the Service, because few activities in the management of natural resources are more challenging than the management of highly migratory species, whether that species is a Pacific tuna or a North American migratory bird.

Nonetheless, concerns have been raised regarding the actual scope of habitat damage; the variability in the total population estimates of light geese; the identification of problem colonies in Canada; and whether the proposed remedy is an appropriate response to what may be a natural, cyclic population boom. In light of these unknowns, it was a fair judgement by Judge Hogan to rule that an environmental assessment (EA) was insufficient.

I think it is a wise decision by the Service to develop a comprehensive environmental impact statement (EIS). A more rigorous evaluation of management alternatives would appear reasonable in light of the real likelihood for unintended impacts. Certainly, the last thing we want to do is unnecessarily apply lethal controls that are too broad or too indiscriminate, especially if more localized management options are available.

I look forward to hearing from the Service on how they intend to complete this EIS within one year, what new research and data they expect to find, and what other management options, or combinations of options they intend to re-evaluate?

I also look forward to learning more about the actual extent of arctic and subarctic breeding habitat damage. It is my understanding that there is documentation of severe habitat damage—principally in the La Perouse Bay region of Manitoba and at Cape Henrietta Maria in Ontario—but that overall damage estimates throughout the entire span of available Canadian summer breeding habitats have not been seriously quantified. It would seem that this basic ecological information is necessary for the Service to be able to approximate the true scope of the threat to breeding habitat.

It also would be helpful to learn how other migratory bird species that share overlapping habitats with light geese have been impacted outside of the areas of documented damage? What might happen to these other populations should the population of light geese drop sharply?

In concluding, as I said earlier, the management of highly migratory species is difficult, and mid-continent light geese are no exception. I commend the Service for its decision to develop an EIS, and I hope as a result that the Service might find suitable management alternatives to enable it to act in a timely and effective manner that is in the best interests of the both the birds and the threatened ecosystems.

Thank you Mr. Chairman. Your leadership on this issue is important and I look forward to working with you in keeping track of the progress made by the Service to complete this important EIS.

[The prepared statement of Mr. Pallone follows:]

STATEMENT OF HON. FRANK PALLONE, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF NEW JERSEY

Thank you, Mr. Chairman, for holding this oversight hearing on the ongoing destruction of the Arctic Tundra by the Lesser snow geese. This is an important issue which must be addressed because its effects will permanently damage the environment and ecosystem of the Arctic Tundra.

Since 1948, the Fish and Wildlife Service has been monitoring the snow geese population. Their studies have shown that the snow geese population has increased from 800,000 in 1969 to more than five million birds today. Biologists at Fish and Wildlife have attributed the population explosion to changes in the landscape and the availability of grain crops. Easy access to food during migration, coupled with low mortality rates, has allowed the species to grow at an enormous pace.

Unfortunately, due to the vast increase in numbers, the snow geese have destroyed thousands of acres of vegetated salt and freshwater marsh. Due to the need for more feeding grounds, the geese have driven out numerous bird species and now threaten an ecosystem that would take decades to rebuild.

Reports indicate that the snow geese have destroyed a third of habitat, another third is almost destroyed, and the geese have focused on the final third. This feeding frenzy has caused millions of dollars in damage to agricultural crops and permanent damage to the ecosystem.

Fish and Wildlife has tried to tackle this problem with increased hunting opportunities, such as expanding the hunting season and increasing bag limits. This has failed. The current harvest of the geese is the lowest in 25 years and the species continues to grow by 5 percent per year.

I look forward to hearing from today's witnesses and I hope that today's oversight hearing will help us move in the right direction so that we can develop a plan that best protects the snow geese population and the valuable ecosystem of the Artic Tundra.

[The prepared statement of Mr. Hunter follows:]

STATEMENT OF HON. DUNCAN HUNTER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF CALIFORNIA

Mr. Chairman, I would like to begin by thanking you for this opportunity to provide testimony to your Subcommittee regarding the irreversible damage currently occurring in the tundra ecosystem of North America by the mid-continent lesser snow goose. As you are aware, this valuable international resource, which provides habitats for hundreds of different wildlife species, is in great danger of irreversible damage because of overpopulation of these geese.

The mid-continent lesser snow goose is an Arctic-nesting waterfowl whose population has thrived in recent years as a result of increased agricultural and urban development and their ability to successfully exploit human modified landscapes. Whereas in most cases this would be viewed as successful wildlife management, in terms of the mid-continent lesser snow goose this emerging pattern has moved beyond desired levels to become an immediate threat to the very survival of this species.

Since 1969, the mid-continent lesser snow goose has been steadily increasing at a rate of 5 percent a year from 900,000 to more than 5,000,000 today. These geese forage by grubbing, or overturning soil, to reach the plant growth beneath the ground. This practice, coupled with the overpopulation, has caused severe environmental degradation to the Arctic ecosystem, almost rendering it useless for future plant growth. Fragile breeding grounds in Northern America, including the areas

of Quebec, Ontario, Manitoba and parts of the Northwest Territories, have experienced irreparable damage to large areas of vegetation. Unlike most cases of wildlife population explosions where nature will balance species and habitat on its own, waiting for this to occur could be devastating. Current land-use practices have increased food supplies and reduced the winter mortality rate of these geese, thereby sending healthy birds back to breeding grounds where they continue to expand, destroying more and more of the North American tundra each season.

This overpopulation also increases the potential for outbreaks of disease and could cause a decline in other species that nest in these regions. This includes semipalmated sandpipers, red-necked phalaropes, yellow rails, American wigeons, northern shovelers and a variety of passerines.

The U.S. Fish and Wildlife Service has estimated that a decrease of one million geese, every year for the next several years, is what would be necessary to bring the mid-continent lesser snow goose population to one that is acceptable by wildlife managers. Taking this into consideration, the liberalization of many hunting frameworks is warranted. This includes modifying several current game-hunting regulations regarding baiting, electronic calls, concealment, bag limits and late-season expansion on and around state, provincial and Federal refuges. Though some conservation groups may consider these actions as severe, complacency can only be characterized as irresponsible.

Earlier this year, the U.S. Fish and Wildlife Service implemented two rules in an attempt to address this growing problem. Specifically, this new policy provides more flexibility for states to allow the use of electronic goose calls and unplugged shotguns which had been prohibited in the past. Additionally, an extension of the harvest of snow geese for southern hunters beyond the current restrictions (March 10) in the Migratory Bird Treaty Act has also been authorized allowing hunters to take light geese outside the traditional hunting season frameworks. I would like to applaud U.S. Fish and Wildlife for these actions and their willingness to pursue viable alternatives.

Despite these steps forward, however, more work remains necessary. Congress has the responsibility to encourage the U.S. Fish and Wildlife Service to utilize the most efficient conservation measures possible to reduce the population of mid-continent snow geese to levels that are consistent with sound biological management principles. This includes the development of a comprehensive management strategy, the liberalization of hunting frameworks and the modification of public land management practices. With these efforts, further destruction of the tundra ecosystem may be prevented and the mid-continent lesser snow geese can populate in a more healthy manner.

Thank you again for allowing me the opportunity to express my thoughts regarding important matters.

[The prepared statement of Mr. Tanner follows:]

STATEMENT OF HON. JOHN S. TANNER, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF TENNESSEE

Chairman Saxton, Delegate Faleomavaega, Members of the Subcommittee on Fisheries Conservation, Wildlife and Oceans, I want to first thank you for your continued leadership in the conservation of our fish and wildlife resources. It is that leadership that brings us here today to examine the plight of the Mid-Continent Lesser Snow Goose, the work of the Arctic Goose Habitat Working Group, and the recent action taken by the U.S. Fish and Wildlife Service.

I want to thank the Members of this Subcommittee for holding this hearing, particularly in light of recent actions involving the Service's final regulations aimed at reducing the populations of lesser snow geese and Ross' geese to a manageable level over the next five years. The action taken by the Service is appropriate and advocated by a host of conservation partners including the state fish and wildlife agencies and Ducks Unlimited. I look forward to hearing from my fellow colleagues here in the House as well as from representatives of some of our conservation partners who have well stated interests in this critical issue and have worked hard to find common ground.

The Problem

Let's face it, the problem is staggering. Over the past 30 years the population of Mid-Continent Lesser Snow Geese has exploded by more than 300 percent. Roughly 900,000 Mid-Continent Lesser Snow Geese were recorded in surveys taken in 1969. Today, many of the estimated five million Mid-Continent Lesser Snow Geese are struggling to survive in the same arctic and sub-arctic breeding habitats that sustained only 900,000 snow geese 30 years ago. Many biologists believe those breeding

habitats are capable of sustaining fewer than two million snow geese today. The population of these snow geese is growing at an annual rate of about 5 percent. Indeed, in 1968 when scientists began studying snow geese in the breeding grounds around La Perouse Bay there were 2,000 breeding pairs. Last year scientists found more than 40,000 pairs. Nesting colonies at Cape Henrietta Maria have exploded from roughly 2,000 pairs in 1960 to 225,000 pairs last year that had hatched more than one million goslings. That means trouble in the states where these birds winter. State waterfowl managers in Arkansas, Mississippi, Louisiana, Texas, and Oklahoma are facing more severe problems in the southern regions of the Mississippi and Central Flyways where snow goose numbers have more than doubled in the last five years alone.

Equally stunning, of the 1,200 mile coastline of Hudson Bay and the Southern James Bay, more than 30 percent of the original habitat is considered destroyed, another 35 percent is severely imperiled, and the remainder is overgrazed. These geese have eaten themselves into crisis.

Mid-Continent Lesser Snow Geese rely on habitats in the arctic and sub-arctic regions of Canada primarily the western coasts of the Hudson Bay and the southern James Bay as well as the Baffin and South Hampton Islands for their nesting and staging areas. Beginning in August these snow geese begin their migration south over the Canadian boreal forests and along the Central Flyway corridor and the Mississippi Flyway corridor to their wintering grounds in Mississippi, Arkansas, Louisiana, Texas, and Oklahoma.

Many waterfowl managers believe the virtually unlimited food source provided by many farmers in the Mississippi and Central Flyway states is part of the reason for the sustained growth rates these geese are experiencing. The available breeding habitats can no longer sustain the present population and that raises a number of threats to both these snow geese and other migratory birds that include the spread of avian cholera and increasing salinity levels in the soil because of the removal of virtually all of the tundra's protective turf by an over-abundance of snow geese.

The Arctic Goose Habitat Working Group

The Arctic Goose Joint Venture, which is one of the Joint Ventures formed to implement the goals of the North American Waterfowl Management Plan, put together the Arctic Goose Habitat Working Group in 1996 to address booming snow goose populations and the resulting degradation of prime breeding ground habitat.

By the end of 1997, the Working Group produced a series of recommendations in its report, Arctic Ecosystems in Peril, that took a significant step towards achieving the necessary consensus needed to begin solving the pressing habitat issues facing Canada and the United States.

- Remove existing hunting restrictions on techniques including the use of electronic calls, baiting, and the practice of creeping.
- Provide for a Conservation Order that permits snow goose hunting beyond the between March 10th and August 31st.
- Encourage native hunters to increase subsistence harvests of eggs and adult birds.
- Expand hunting opportunities on some National Wildlife Refuges in an effort to help disperse the geese from typically protected areas.
- Work with waterfowlers and land owners to improve access to private lands.
- Encourage state wildlife agencies to develop reciprocal agreements among the states to exempt nonresident waterfowlers from purchasing multiple licenses to hunt snow geese.
- And finally, remove or greatly expand current bag and possession limits.

The recommendation to reduce the lesser snow goose population by half has been endorsed by the U.S. Fish and Wildlife Service, its Canadian counterpart, the state fish and wildlife agencies, Ducks Unlimited, the Ornithological Council, the Wildlife Management Institute, the Arctic Geese Stakeholders Committee, the National Wildlife Federation, and the National Audubon Society.

Earlier this year, the Service adopted a series regulatory strategies aimed at giving state wildlife agencies in 24 states, primarily those in the Mississippi and Central Flyways, the flexibility to begin addressing the problems identified above with stepped up conservation measures.

- States will be permitted to implement conservation orders under the Migratory Bird Treaty that allow hunters to take light geese outside the traditional migratory bird hunting season frameworks. This essentially would permit hunters to pursue light geese between April 1st and August 31st.
- Hunters will also be permitted to use electronic goose calls and unplugged shotguns.

This action is expected to reduce the snow goose population by 1.25 million geese in the first year, 1.9 million in the second year, and 2.7 million in the third year. These estimated figures included the average 600,000 geese that are harvested under existing hunting frameworks.

I want to make it abundantly clear, the Service's Conservation Order must be implemented. If these actions are not taken and the snow goose population is allowed to grow even more, the consequences will be such that in the years ahead we may not have the options we have today.

Restoring these critical habitats for not only the lesser snow goose, but the many other species of migratory birds and wildlife that depend on the same habitat for their existence, is already expected to take decades. To delay further, in my view, borders on a complete abdication of our stewardship responsibilities.

The Future

Like many who have been working on this issue for much longer than me, I don't believe the solution to this problem now or in the future will be a simple one. But I do believe we need to take several steps to prepare for the long-term management of the Mid-Continent Lesser Snow Goose population at sustainable levels in an effort to restore these critical habitats.

Finally, as I said a year ago when this Subcommittee held a hearing on this issue, funding for migratory bird programs is not sufficient to meet our responsibilities. The Service requested an increase of $2.3 million for its migratory bird management programs, which includes $200,000 specifically for snow geese. The Joint Flyway Councils have recommended a budget increase of $5 million to better address goose population monitoring and related management and research needs. Both the Service and the Congress would do well to seriously consider the merits of the Joint Flyway Council's recommendation.

The Cost Of Doing Nothing

The cost of doing too little or nothing at all will be excruciating if not irresponsible. The Mid-Continent Lesser Snow Geese have now become a serious threat to their own existence in the view of many. Their destruction of these prime habitats are threatening the existence of many other species of migratory birds including shorebirds and songbirds. Specifically, puddle ducks like the American wigeon and shovelers no longer use the freshwater wetlands in and around the colony, according to experts like Dr. Batt. They are finding that many non-game migratory birds like the stilt sandpiper in the arctic and subarctic habitats are declining in numbers because of the extreme habitat degradation brought about by the abundance of these snow geese.

One thing is clear to everyone who has objectively reviewed this issue. Doing nothing is neither scientifically viable, nor is it an acceptably responsible solution.

Again, thank you Mr. Chairman, Delegate Faleomavaega, Members of the Subcommittee, and those who have been working on this problem through the Working Group for helping to raise awareness about the plight of the lesser snow goose and its habitats.

Mr. SAXTON. With that, I would like to introduce our first panel. The Honorable Collin Peterson who is with us, and the Honorable Chip Pickering is or will soon be; he is here. If you gentleman would like to take your places at the table, you may begin, and we will begin with Collin. Thank you for being with us. We appreciate your interest in this issue, and we are interested in hearing your testimony.

STATEMENT OF HON. COLLIN C. PETERSON, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MINNESOTA

Mr. PETERSON. Thank you, Mr. Chairman, and I guess I thought that Chairman Young was going to be here. I was going to let him get into all of the details of this. I guess, I don't know that I am any kind of expert, but I wanted to just relay some of my personal observations that some other members may not have had the opportunity to be involved in.

One of the things I do for work and for fun is fly airplanes, and we go up into the Arctic with our floatplanes every once in a while, and I have had the opportunity to fly over this area that is in question, and I don't think a lot of people have had the opportunity to be up in this part of the world. It is a whole different situation,

and things grow very slow up there, and it is a serious situation if we allow this to deteriorate any further. I don't know that it will ever come back or if it does, it will be extremely in happening.

The other thing that I don't know if a lot of people realize just exactly what this kind of country is like up there. There is from Churchill up to Baker Lake, which you fly across this area, there are no roads; there is nothing there; no way to access it. So, if we don't figure out some way to control these populations, they are going to decimate the area, and I don't know how you would ever get in there and do anything to turn it around.

So, I don't know if the solutions that we have are working all that well. The other thing that I can report on, I have had a lot of my friends and neighbors have been over in North Dakota and South Dakota and other places—Minnesota chose not to have a hunting season this spring—but I have been getting mixed reports on the success of these hunts.

These geese, if any of you have ever hunted snow geese, are very difficult to hunt. Back in the old days when most of the flock was young birds, they were pretty dumb, and you could decoy them in and get a decent chance of harvesting some birds, but as this population has become healthier and older, they are a lot smarter—it doesn't matter whether it is the fall or the spring—and they are very difficult to hunt, and so the success rate—some people have had some decent success, but others have gone over and harvested one or two birds after hunting for 2 or 3 or 4 days. So, I am not sure taking these limits off, increasing these limits, or having the spring hunt, just from anecdotal evidence, I am not so sure how much we are taking off the top of the population with this hunt.

So, I mean, it is the right thing to do, I think, and it is an idea that gets at the problem, but, frankly, I just think we have kind of let this thing get ahead of us, and we were a little slow in getting to the—putting some solutions in place, and I don't know exactly what the overall harvest has been, but my sense is that in our part of the world they are not taking that many geese. I can tell you in the fall, I have been out snow goose hunting, and we usually come home skunked or close to it. They are very, very smart; very, very hard to hunt, and I just commend the Fish and Wildlife Service and all the other groups that have been working on this trying to come up with a solution, and we in the Sportsmen's Caucus have been concerned about this and have tried to do our part to publicize it and to work with all the other folks to try to come up with a solution, and I don't know if this is going to work. I am not sure what else you can do. Eventually, what probably will happen if this keeps on, is we are going to end up with some kind of a disease problem, and it will take of itself maybe, which would be an unfortunate situation.

I would be interested in hearing from, I guess, the witnesses today just how successful this has been, but up in our part of the world, at least, I am not sure they were that tough on the population, but, as I say, it is the right to do.

So, we commend you for having this hearing, and we in the Sportsmen's Caucus will do anything we can to help you and the Committee and others work on this issue, and I would be happy

to answer any questions. I defer to my colleague from the Sportsmen's Caucus, Mr. Pickering.

Mr. SAXTON. Thank you very much, Collin.

We will turn now to the gentleman from Mississippi.

STATEMENT OF HON. CHIP PICKERING, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MISSISSIPPI

Mr. PICKERING. Thank you, Mr. Chairman. I, too, want to commend you for holding this hearing. I do, as Collin, serve in the Sportsmen's Caucus as the vice-Chair. I am an active hunter and conservationist from my region; Collin gives a good perspective from his region, but we are beginning to see the impact of the overpopulation of the snow goose in the southern flyway, the Mississippi Flyway, that includes 24 States, including my home State of Mississippi.

Now, the southern States are seeing the harm because of the availability of food in the rice farms of Mississippi, Arkansas, Louisiana, and Texas. More than 2 million acres of rice crops and millions of acres of grain farms in the Midwest are becoming feeding grounds for the snow geese. As a result of the increased food supply, snow geese are living longer and reproducing at a higher rate which causes the destruction of 135,000 acres of the Hudson Bay lowlands, the Arctic habitat of the snow geese.

With the addition of the abundance of food in the South and Midwest, combined with the establishment of sanctuaries along the flyways and the decline in harvest rates of snow geese, there is a need for action to control the population of these migratory birds.

Now, over the last few years, the U.S. Fish and Wildlife Service has worked with Canadian Wildlife Service, Ducks Unlimited, the National Audubon Society, and many States' Department of Fish and Game to formulate a report called the Arctic Ecosystems in Peril which outlines methods to stop the destruction of the Arctic tundra. In February, 1999, the U.S. Fish and Wildlife issued two rules that would help solve the current snow geese situation. One allows hunters to use unplugged shotguns and electronic duck calls to hunt snow geese during the normal hunting season when all other waterfowl and crane hunting seasons are closed. The second authorizes certain States to implement action to harvest snow geese by shooting in a hunting manner inside or outside of the regular open migratory bird hunting season framework.

I believe these two policies are good steps in the right direction, but more needs to be done to solve the overall problem. I support many of the recommendations of the U.S. Wildlife Service, the report that they have issued, and I hope that these recommendations are considered and implemented.

And, finally, I want to emphasize the need for quick action on this issue. The habitat of the snow geese and numerous other species is threatened by the destruction of the Arctic habitat. Furthermore, the farmers in the South and Midwest need relief from the damage done to their crops by the snow geese. Reducing the population of snow geese is a priority for conservationists and sportsmen, and it is my hope that action is taken quickly to protect the habitat of these birds and the other animals that live in the same environment.

And, again, I just want to emphasize the need for the quick implementation of the recommendations of the U.S. Fish and Wildlife report, and I hope that we can work with you, the Sportsmen's Caucus, as we have worked with other committees. Anything we can do to help carry these out and meet this immediate need I think is of critical importance. Thank you very much.

[The prepared statement of Mr. Pickering follows:]

STATEMENT OF HON. CHARLES W. "CHIP" PICKERING, JR., A REPRESENTATIVE IN CONGRESS FROM THE STATE OF MISSISSIPPI

Mr. Chairman, Members of the Subcommittee, thank you for allowing me to speak to the Subcommittee about the issue of Mid-Continent light geese, also called snow geese.

It is my privilege to serve as a Co-Chairman of the Congressional Sportsmen's Caucus. As an active hunter and conservationist, I believe we must address the population explosion of snow geese. Snow geese migrate in winter to the United States portions of the Central and Mississippi Flyways that include twenty-four states, including my home state of Mississippi.

The overpopulation of snow geese hurts southern states because of the availability of food in the rice farms of Mississippi, Arkansas, Louisiana, and Texas. More than two million acres of rice crops and millions of acres of grain farms in the Midwest are becoming feeding grounds for snow geese. As a result of this increased food supply, snow geese are living longer and reproducing at a higher rate which causes the destruction of 135,000 acres of the Hudson Bay lowlands—the Arctic habitat of snow geese.

Because of the abundance of food in the South and Midwest, combined with the establishment of sanctuaries along the flyways and the decline in harvest rates of snow geese, there is a need for action to control the population of these migratory birds.

Over the last few years, the U.S. Fish and Wildlife Service has worked with the Canadian Wildlife Service; Ducks Unlimited; the National Audubon Society; and many states' Department of Fish and Game to formulate a report called "Arctic Ecosystems of Peril" which outlines methods to stop the destruction of the Arctic tundra. In February, 1999, the U.S. Fish and Wildlife issued two rules that would help solve the current snow geese situation. One allows hunters to use unplugged shotguns and electronic duck calls to hunt snow geese during a normal hunting season when all other waterfowl and crane hunting seasons are closed. The second rule authorizes certain states to implement actions to harvest snow geese by shooting in a hunting manner, inside or outside of the regular open migratory bird hunting season framework.

I believe these two policies are good steps in the right direction but more needs to be done to solve the overall problem. I support many of the recommendations of the U.S. Fish and Wildlife Service's "Arctic Ecosystem in Peril" report and I hope some of these recommendations are considered and implemented.

Finally, I want to emphasize the need for quick action on this issue. The habitat of the snow geese and numerous other species is threatened by the destruction of the Arctic habitat. Furthermore, the farmers in the South and Midwest need relief from the damage done to their crops by the snow geese. Reducing the population of snow geese is a priority for conservationists and sportsmen and it is my hope that action is taken quickly to protect the habitat of these birds and the other animals that live in the same environment.

Thank you.

Mr. SAXTON. Thank you. I would just like thank you both for your observations and your perspectives on what is obviously a very serious issue and one that has been under consideration by the Fish and Wildlife Service and by the Sportsmen's Caucus, I might add. Duncan Hunter and Duke Cunningham and others have been urging legislation on this matter, and, frankly, I have been holding back, because the Fish and Wildlife Service has been engaged with the biologists and experts in trying to manage this situation correctly, and, unfortunately, they have hit a couple of snags now which are unfortunate.

I appreciate, Collin, your description of the problem and the difficulty of hunting them. The Fish and Wildlife Service believes that they do have some new methods or some new tools that can be used in hunting that will be quite effective, and we are going to hear from them a little later.

By way of observation, these birds, even on the East Coast, get so thick—of course, the main problem now is in the center of the country—but even on the East Coast, they are becoming very prolific and very thick and are digging up mud flats all up and down the coast, and my son-in-law who is a great hunter, went out—he lives on a farm, and he went out and laid down behind the stone wall; the snow geese flew over him; with two shots, he killed nine geese; that is how thick they are, and I guess there was little luck involved in it, but he has told that story enough that I don't think he is exaggerating; I think he really did that.

So, there are good reasons, and you have outlined them with your observations especially well, and I am hopeful that we will collectively be able to come to grips with this very serious issue before they do run out of food in the tundra and before they do, therefore, become diseased and die miserable deaths. I don't know whether any of my other colleagues have observations, comments or questions that they would like to make at this point.

Mr. HANSEN. What is the limit on snow geese? How is your son-in-law enjoying his time in prison?

Mr. SAXTON. Well, it was a mistake, you know. He just had those two shots and try that in front of a Federal judge sometime.

Mr. HANSEN. Tell him you got a double at the last, so you pushed one down in the mud or you——

Mr. SAXTON. Harry is defending my son-in-law, and says the bag limit is 15.

Mr. PETERSON. I think the limit was 10 before we started the special season, so I think he was probably okay.

[Laughter.]

I am not a game warden.

Mr. HANSEN. I have no questions, Mr. Chairman. I would like to say, I hope we don't overreact on some of these things. Sometimes I think we are a reactionary group, but I will be interested in seeing what comes out of all this.

Mr. SAXTON. Mr. Gilchrest.

Mr. GILCHREST. Thank you, Mr. Chairman. I think your son-in-law is all right. I know in Maryland the limit is 15 from about October through February.

I want to emphasize to our colleagues that it really is—it isn't a growing problem on the Atlantic Flyway, it is a major problem on the Atlantic flyway, and I hope the Fish and Wildlife when they come up with this ever-changing policy with snow goose—and I want to thank them for all their efforts in this—but it is growing so fast on the Eastern Shore of Maryland that you can literally lose 100, 200, 300 acres of wheat in a matter of—winter wheat—in a matter of a couple of days. You can go out there and chase those buggers away, and if you happen to have 1,000, 2,000 acres and you are someplace else, they will come back in 10 minutes.

They have really—they have adapted to the fact that gas guns won't hurt them; they have adapted to the fact that flags won't

hurt them; they have adapted to the fact—just like a beehive—that as soon as a pick-up is gone, they come back in. So, it is going to be a major undertaking.

I agree with my colleague from Utah that we don't want to overreact, but to get back in and strike this very complex, difficult position of bringing nature back into balance because of extraordinary human activity or because of the fundamental dynamic of natural systems, but I will think we will be able to do it, and good luck in your area, fellows.

Mr. PICKERING. Mr. Chairman, I would just like to add, in many ways we are benefiting from the success from our conservation efforts and the set asides that we have done, the practices setting aside the habitat and the food supply, but if we don't take drastic action on the snow geese problem—just for the Mississippi Flyway where we are seeing, like you, Mr. Gilchrest, just talked about how they can wipe out a field in an agricultural area and the habitat—it will begin to affect, and it has already begun to affect, other species, and so where we have made great strides in regaining the populations of waterfowl, it not only affects the snow geese population but all other waterfowl populations.

So, we want to be wise and prudent, but we do need to take action now to be able to keep all other populations increasing, and the success that we have had from our other conservation programs continuing, and if we don't, it becomes out of balance; it could spiral downward, and we do need to take action now.

All of the recommendations that the U.S. Fish and Wildlife Service, I think if they are implemented now and done quickly and urgently, that we can rebalance or correct the situation we now face.

Mr. SAXTON. Mr. Pombo.

Mr. PETERSON. Mr. Chairman, if I could just—you know, I would like to—I think the people in the Sportsmen's Caucus would like to know what these new hunting methods are, so we can go out and be more successful. So, if the Fish and Wildlife Service wants to come over and teach us, we would be more than happy.

Mr. GILCHREST. If the chairman will yield for just 30 seconds, I can tell you on the Eastern Shore of Maryland they go out there, and it is correct, you can shoot 15 a day for months at a time. They are difficult to shoot, just like shooting beehives, but what these fellows do is they go out there in the fields and they cover themselves with a mat made of cornstalks, and then the guide at one point will say okay. Even if those geese are flying over you 3 feet above your head he is the one that triggers the assault, if you will. You throw those mats off, you get up there, and a friend of mine with four other fellows got, I don't know, something like 80 geese, and they eat them all; they don't throw them away; they eat them all. So, that is one method, Collin.

Mr. PETERSON. Yes, I understand the method; I have been out and tried that. The problem is in our part of the world, you never know exactly where they are going to go, and it is a lot of luck. If you happen to be in the field and you have got yourself covered well enough, you may be able to get them to decoy in, but they are smart, at least in our part of the country, very smart, and they will sit up there 200 yards and circle above you, and more often than not go someplace else. Maybe they are dumber in Maryland than

they are in North Dakota, but I will have to come out there and check it out.

[Laughter.]

Mr. SAXTON. Well, I would like to thank both of you for your comments again and suggest, if you have time, if you would like to stay with us, we are going to have a full discussion here about what Fish and Wildlife has been up to. In any event, we thank you for being here; we appreciate your comments.

We will, at this point, move on to our next panel, which is—we are going to hear from Dr. John Rogers who is the Deputy Director of the U.S. Fish and Wildlife Service, and, Dr. Rogers, we do have a 5-minute rule, but, obviously, we are very interested in hearing a thorough discussion this morning, so why don't you take such time as you need to enlighten us on the activities that you have undertaken in the last year or two and where we are and how well you think things are working.

STATEMENT OF DR. JOHN ROGERS, DEPUTY DIRECTOR, U.S. FISH AND WILDLIFE SERVICE

Dr. ROGERS. Thank you very much, Mr. Chairman. It is, once again, a pleasure to appear before you and the rest on the Committee on an issue that is of increasing importance to all of us, whether we are wildlife professionals, agriculturalists, hunters or wherever we find ourselves. We appreciate the opportunity to appear before you today to talk about the ecological problems that are being caused by the overabundance of light geese, particularly in the Mid-Continent.

As you alluded to earlier, management of light goose populations in North America has presented the wildlife management community with one of its most challenging tasks. This is in stark contrast to the efforts earlier in this century to stem the market hunting and other commercialization of these birds that happened in the 1800's and 1900's. We are now faced, in contrast to those years, with managing some populations of geese that have become so overabundant that they are literally destroying their breeding habitat.

The population of Mid-Continent light geese is, that principally lesser snow and Ross' geese, has grown to more than 300 percent over the last 30 years, from an index of 900,000 birds in 1969 to an index of over three million birds today. These population levels far exceed any historical estimates. The rapid growth of the population has been primarily attributed to the expansion of agriculture along the Central and Mississippi Flyways and the resultant low mortality and increased winter survival.

As you alluded to earlier, both you and Mr. Gilchrest, Mr. Chairman, another population of geese that is steadily increasing as a result of increased use of agricultural lands is the greater population snow geese in the Atlantic Flyway—or the population of greater snow geese. Arctic habitats that are harmed by Mid-Continent lesser snow geese may take decades to recover if they ever do. Currently, as you mentioned, 35 percent of the 135,000 acres of habitat in the Hudson Bay lowlands is considered destroyed; another 30 percent is damaged, and 35 percent is heavily grazed. Habitat damage is not limited to that done by the breeding geese,

and breeding goose colonies; it is also caused by northward-bound spring migrants who stop and feed in these same areas.

Although you may hear from some individuals and some organizations who are opposed to our actions, the Fish and Wildlife Service along with the Canadian Wildlife Service and virtually every wildlife biologist with experience in the Arctic in both countries believes that the Mid-Continent light goose population has exceeded the carrying capacity of its breeding habitat, and the population must be reduced to avoid long-term damage to an ecosystem that is important not only to those birds but to every other species of wildlife that shares that habitat. This is based on the virtual unanimity in the scientific peer review literature that supports our understanding of the damage that is being done to this habitat.

In a paper submitted to this Subcommittee for the hearing record, Canadian authorities have stated that, quote, "There is a broad consensus that the present growth rates of the geese cannot be sustained and that the particular kinds of habitat preferred by the geese are threatened in many areas." In 1997, the Arctic Goose Habitat Working Group of the Arctic Goose Joint Venture recommended that wildlife agencies take steps to reduce the Mid-Continent light goose population by 50 percent by the year 2005, and I would like to submit a copy of that report for the record, if I might, Mr. Chairman.

Mr. SAXTON. Without objection.

Dr. ROGERS. An environmental assessment of the Mid-Continent light goose situation was completed by the Fish and Wildlife Service after extensive consultation with State, with provincial, private, academic, and non-governmental partners in both the United States and in Canada. Several alternative management actions for reducing light goose populations were examined in that assessment. The preferred alternative was to use new methods of take, namely electronic calls and unplugged shotguns, for use by hunters during normal waterfowl hunting frameworks when all other waterfowl and crane seasons were closed and also to advocate the creation of a conservation order that is a special new management action designed to decrease populations. This order authorized takes of snow geese during the normal framework closed period of March 10 to August 31st.

The Service published two rules in February 16th of this year implementing that alternative in 24 States of the Mississippi and Central Flyways. Several of those States implemented those regulations immediately as we published those rules, and based on reports from field biologists, the new regulatory approach appears to be successful. The Canadian Wildlife Service has implemented similar regulations.

To compliment harvest management actions, we have initiated land management practices that will increase susceptibility of light geese to harvest and make some lands less suitable for utilization by these birds. These actions will focus on five points: first, providing increased hunter opportunity; second, decrease food availability; third, manipulating wetland areas to decrease their attractiveness to snow geese; fourth, allow altering winter habitat, and, five, conducting an aggressive communication and outreach program so that everybody understood both the situation and po-

tential solutions. In addition, the Canadian Wildlife Service has been working with aboriginal groups to encourage them to take more geese in and around the breeding areas.

It is known, however, that this can only be part of the overall solution. To date, no feasible method for reducing population numbers in the northern areas has been proposed. The Service's management action has received widespread support from the scientific and conservation community. Conservation groups such as the National Wildlife Federation, the Wildlife Management Institute, the Ornithological Council, the American Bird Conservancy, and Ducks Unlimited—who you will hear from today—have expressed strong support for the light goose population reduction program.

In addition Flyway councils, the International Association of Fish and Wildlife Agencies and individual State wildlife agencies have worked closely with the Service to implement these management actions. Nevertheless, on March 3rd of this year, the Humane Society of the United States and several other animal rights groups filed suit against the Service challenging these new regulations maintaining that the Service had violated the Migratory Bird Treaty Act by enacting new regulations and that an Environmental Impact Statement should have been completed prior to implementation of these rules.

On March 18th, Judge Thomas Hogan denied a preliminary injunction sought by the plaintiffs indicating that the Service's actions constituted a reasonable use of its authority under the Migratory Bird Treaty and that the population reduction program was based on sound scientific evidence. However, the judge concluded that the plaintiffs had demonstrated the substantial likelihood of success on the merits of their NEPA claim and that an Environmental Impact Statement should have been prepared. Based on the written opinion of the court, the Fish and Wildlife Service has not to continue with litigation and will initiate preparation of an EIS immediately and to withdraw the two regulations on light goose population reduction after the northward migration is complete. It is possible that the time requirements for preparing this EIS may preclude resumption of light goose management actions next spring and therefore prolong a resolution of this issue of habitat destruction.

The Fish and Wildlife Service firmly believes that aggressive management intervention is a necessary and scientifically sound approach for the control of white goose populations. Without intervention, we will likely witness the destruction of an ecosystem that is important to snow geese as well as every other species of wildlife that shares this habitat, and it also possible that the snow goose population will crash and remain at extremely low levels due to lack of suitable breeding habitat, the spread of disease, and predation.

We are committed to continuing to work with State fish and wildlife agencies, Canadian wildlife authorities, and public stakeholders to address this issue of the overabundance of white geese. Again, Mr. Chairman, thank you for the opportunity to appear before you today. I am prepared to answer any questions that you might have.

[The prepared statement of Mr. Rogers may be found at the end of the hearing.]

[The information may be found at the end of the hearing.]

Mr. SAXTON. Well, thank you very much, Dr. Rogers. In my testimony, I mentioned that the current population, which is an estimated five million, is projected to increase over the next 3 years to almost seven million, 6.8 to be more precise. What affect will that potential increase have on habitat?

Dr. ROGERS. It will continue the destruction that has already occurred. I think one can expect that the complete destruction of habitat from 30 percent will rise into the range of 40 percent. You will start seeing effects on—increased effects on young birds with reduced size, weight, date of fledgling, increased disease occurrence and potential, increased starvation of young birds, increased freezing of young birds who haven't developed the necessary flight feathers to leave the Arctic before winter sets in. Concomitantly, in the southern areas—you heard from both Mr. Pickering and Mr. Peterson as well as Mr. Gilchrest—the agricultural damage that these birds cause in the winter; an increase by another almost two million birds will increase dramatically the depredations they cause on agricultural crops. The situation won't get any better.

Mr. SAXTON. Can you guess at how long it would take with a population of seven million birds for the destroyed tundra to reach the 40 percent level?

Dr. ROGERS. How long it would take to reach that level? I cannot project directly, but I would suspect in a matter of 2 to 3 years. We can get a better answer for you for that for the record.

Mr. SAXTON. And at what point do you suppose the population would level off because of lack of food and disease?

Dr. ROGERS. Again, we are not certain of that. Dr. Batt, who will appear later, probably has a better idea, but these birds are very mobile, and after destroying the habitat along the Hudson Bay lowlands and the coast or traditional areas, they have shown amazing plasticity to begin using other areas that they have not historically used. So, it is potentially—it is at least a potential that the population may not immediately crash but move on to destroy other habitats that are, right now, very little if at all affected.

Mr. SAXTON. Well, what other critters depend upon the habitat in the Hudson Bay area that is being destroyed?

Dr. ROGERS. There is a wide variety of, particularly, migratory birds. It is a heavily used area, of course, by the polar bears and others—polar bears, of course, making it logistically difficult to work up there—but all species of birds that use the area are potentially affected, particularly semi-palmated sandpipers and red-necked phalaropes. The breeding pair counts of those have declined over the last number of years. Yellow rails, a species once abundant at LaPerouse Bay on Hudson Bay are not seen there at all right now. Other shorebirds as well as shovelers, American widgeon, are potentially affected, but, really, any species of bird that shares that habitat is potentially at risk.

Mr. SAXTON. A little later, we are going to hear from some other witnesses, and I will anticipate that we will hear a phrase which is "Let nature take its course." This is an option which, obviously,

has been talked about and considered. Why not simply allow the population to crash and let nature takes its course?

Dr. ROGERS. Well, Mr. Chairman, I think there is a—the statement that leads one to believe that nature will take its course is based on an incorrect premise and that is that it has been a natural situation that has got us here. What we have is an unnatural situation where the population has been kicked up to unusually and unnaturally high levels by the change in agricultural practices in the Mid-Continent of the United States, so the birds are essentially released from the normal limiting factors, that is winter survival, on their population. So, the option, in my view, might better be termed the "do nothing" option, and it is, in my view, the Fish and Wildlife Service's view, not a responsible option to take, though maybe it ought to be considered.

The results of that—we talked about a little bit a minute ago—would be continued destruction of habitat, more widespread, and the potential that many of the scientists believe that this will never recover. You end up with smaller, weaker young; susceptibility to disease that would affect both birds in the North as well as along the migratory routes; starvation; freezing for those that can't fly away when winter comes; irreversible impacts on the habitat lead to irreversible impacts on other species, and, as you suggested, ultimately, the snow goose population, once the habitat is destroyed, may stabilize but at a considerably lower level and with a habitat, a breeding habitat, that cannot support higher populations, I believe would be in a positive feedback situation that would lead us to a catastrophic and permanent crash and the habitat and the populations of birds that depend upon it.

Mr. SAXTON. My time has almost expired, but let me ask one final question. It is obvious that your proposal has some opponents, otherwise, there wouldn't have been the activity in court. Obviously, you have got some supporters, and, obviously, you have got some folks who disagree. Can you kind of give us a lineup of the scientific and environmental groups and animal rights groups and where they all line up on this?

Dr. ROGERS. Every conservation group that I am aware of, every scientific group that I am aware of, all of the scientific literature, and all of the scientists who have produced that literature are in support of our approach to this problem. Those who on the animal rights side who do not agree that we should be intervening in what they view as a natural situation, such as those you will hear from today, oppose us, but the way I characterize it, it is a matter of the science supports the Fish and Wildlife Service; sometimes the emotion and the opinion of others leads people to line up on the other side.

Mr. SAXTON. Thank you. Mr. Gilchrest?

Mr. GILCHREST. Thank you, Mr. Chairman. Mr. Rogers, where do the snow geese along the Atlantic Flyway spend their spring and summer months?

Dr. ROGERS. They are breeding in the eastern Arctic.

Mr. GILCHREST. Now, that is a completely different—so, the eastern Arctic, is that being damaged as much as the Hudson Bay area?

Dr. ROGERS. Not to this point. The populations have not reached a point where they are critically damaging their breeding habitat. The major problems at this time caused by the greater snow geese are in the salt marshes and agricultural areas. We—and I didn't mention—as we prepare this EIS, we will be bringing into that the greater snow geese on the East Coast, because, though the problem is not as severe right now, if we were to let it go without action and consideration, it will become so.

Mr. GILCHREST. You mentioned a couple of times about one of the reasons for the explosion of population is the change in agricultural practices in the Midwest. Now, is this within the last 10 years, 50 years, 100 years? I think they have been growing grain out there for a long time.

Dr. ROGERS. Yes, and it took the snow geese time to adapt to it. Historically, they wintered in the coastal areas along the Gulf, but as the habitat was altered to support rice farming and as corn growing in the upper Midwest allowed them to winter farther north, the population slowly expanded. I can remember when—the Fish and Wildlife Service is not totally blameless in helping to encourage snow geese. A number of our refuges for years planted crops and encouraged crops around the refuges and on the refuges to support these critters.

Mr. GILCHREST. You mentioned five fundamental policy changes that you thought would help reduce the exploding population. One is increased hunting or increased hunters. Could you give us some specifics like encouraging increased hunting to the State Department of Natural Resources, lengthening the season, take the plugs out of the shotguns, electronic calls? What exactly would you recommend?

Dr. ROGERS. Okay, what we had done before this year was to allow the full 107-day season that the Migratory Bird Treaty would allow and double the Federal limit on snow geese to about 20 birds and remove possession limits. Unfortunately, as at least Mr. Peterson alluded to, most hunters certainly of the Mid-Continent, like geese, are not approaching their limits. We recognized that more had to be done. Therefore, we have instituted or had instituted during the regular season a situation that would allow the use, subject to State authority, of electronic calls and unplugged shotguns. These, at least from anecdotal reports of hunters, have been very successful. Of course, we won't know the success——

Mr. GILCHREST. Were these implemented this season?

Dr. ROGERS. These were implemented in late February of this season, so we don't have——

Mr. GILCHREST. Now, is that also in the Atlantic Flyway?

Dr. ROGERS. No, it was mostly in 24 midwestern States.

Mr. GILCHREST. Will it be in the Atlantic Flyway next season?

Dr. ROGERS. It will not be in the Atlantic Flyway season or anywhere else until we finish an EIS. So, under the present condition, we have removed——

Mr. SAXTON. Will the gentleman yield?

Mr. GILCHREST. Yes.

Mr. SAXTON. Mr. Rogers, Dr. Rogers, would you explain what the current situation is relative to the court ruling as it pertains to the ongoing status of the regulations?

Dr. ROGERS. Yes. The judge, in hearing the preliminary injunction requested by the plaintiffs in this lawsuit, determined that we were, as I said earlier, acting within our authority and responsibilities under the Migratory Bird Treaty Act but suggested that if this were pursued in court, we would be vulnerable on the grounds of not having followed the National Environmental Policy Act. Therefore, we have suspended both of these actions pending the completion of an EIS.

Mr. SAXTON. Which will be accomplished over what period of time.

Dr. ROGERS. Which will take 12 to 18 months, which I would suggest, at least at this time as far as we know it, would mean that we would not be able to use these more liberalized regulations in the future.

Mr. GILCHREST. Which means we have got a lot of family members out there running through the winter wheat fields chasing geese.

You mentioned decreasing food in agricultural lands. How do you decrease their food?

Dr. ROGERS. Well, that is a land management practice that would fall upon refuge managers whether they be State managers or Federal managers; that is to stop planting food crops that the geese use that, in many cases, hold them on refuges.

Mr. GILCHREST. It may cause them to go to the——

Dr. ROGERS. It may cause them to go out there where they are more vulnerable.

Mr. GILCHREST. You mentioned manipulating wetlands. How would you do that?

Dr. ROGERS. Well, by controlling the—again, in managed wetlands, principally, in State and Federal areas, we can control the water level. The snow geese tend to like shallower waters, so it would be managing a water level that was deeper that was less attractive to them.

Mr. GILCHREST. Are there that many wetlands that have water that you can control the level?

Dr. ROGERS. Again, on many Federal and State management areas, yes, and these have become very important to snow geese in the wintertime.

Mr. GILCHREST. How would you—I am going to—Mr. Pombo yielded some of his time to be my proxy, if I could just say that, Mr. Chairman.

[Laughter.]

Mr. SAXTON. That is unusual, but since it is your birthday, we will——

[Laughter.]

Mr. GILCHREST. Thank you very much, Mr. Chairman.

Just two quick questions. What methods are you now using with the Canadians in coordination with what we are doing down here as far as trying to find some method of altering those spring and summer habitats to reduce the breeding up there?

Dr. ROGERS. The Canadians have instituted very similar hunting regulations, as we did, so we are in complete coordination there. Of course, all the lands where they breed are in Canada, and the Canadian government has indicated in their statement suggested

there has not been any proposal or any serious consideration yet of actions on the breeding ground. They are logistically very difficult; safety concerns; it would be very expensive, and in doing so, the harvest rights of aboriginal Canadians would have to be considered. So, the hope is that we, with the hunting process, can reduce the population to the levels needed and not have to think of more draconian levels that would take—draconian actions on the breeding grounds.

Mr. GILCHREST. I see. So, the change of policy implemented in the Midwest in February will be withdrawn until the lawsuit is done?

Dr. ROGERS. It will be withdrawn until the Environmental Impact Statement is done.

Mr. GILCHREST. I see. And that will be done——

Dr. ROGERS. And that will be done over the next 12 to 18 months.

Mr. GILCHREST. Oh, I see. So, a State, for example, cannot implement any changes like electronic calls, unplugged shotguns?

Dr. ROGERS. That is correct.

Mr. GILCHREST. Those kinds of things.

Dr. ROGERS. That is correct.

Mr. GILCHREST. I see. Well, thank you very much, Dr. Rogers. Thank you, Mr. Chairman.

Mr. SAXTON. You are welcome, and next year on your birthday, we will give you extra time again.

Mr. GILCHREST. Appreciate that.

Mr. SAXTON. Dr. Rogers, thank you very much for your comments and for your testimony. The members may have some additional questions, and we ask that you respond to them in writing. The record for that will remain open for 30 days. Thank you for being with us.

Dr. ROGERS. Thank you, Mr. Chairman. Thank you, Mr. Gilchrest.

Mr. SAXTON. Our third panel this morning consists of Mr. Gary Taylor, legislative director of the International Association of Fish and Wildlife Agencies; Dr. Vernon Thomas, representing the Humane Society of the United States; Dr. Robert Alison, from Orillia, is it? Canada, Ontario, who is, I understand, also a member of the Humane Society but is here today on his own behalf; Mr. Tom Adams, senior policy advisor of the National Audubon Society; and Dr. Bruce Batt, who is the Chairman of the Arctic Goose Habitat Working Group and chief biologist of Ducks Unlimited who I understand is also from Canada.

Thank all of you for being with us. Let me remind you of the 5 minute time limit, and, Mr. Taylor, when you are prepared, you may begin.

STATEMENT OF GARY TAYLOR, LEGISLATIVE DIRECTOR, INTERNATIONAL ASSOCIATION OF FISH AND WILDLIFE AGENCIES

Mr. TAYLOR. Thank you, Mr. Chairman. I am Gary Taylor, legislative director for the International Association of Fish and Wildlife Agencies. We appreciate the opportunity to share with you today our perspectives on the increase of the Mid-Continent lesser snow

goose population and the impact they are having on the Arctic tundra habitat.

The association firmly supports the Fish and Wildlife Service's final adopted rules on the management of Mid-Continent light geese as a very measured response, implemented after extensive discussions with the resource managers in the States and Canadian provinces, between the Federal governments of the United States and Canada, and with interested constituencies and publics. We would urge the Subcommittee's support for these actions and also your support for increased funding to the Service for monitoring the effectiveness of these conservation measures.

The association and its member agencies are very familiar with the necessity for action to address the overpopulation of snow geese that is causing substantial adverse impact on the Arctic tundra. As you may recall, we appeared before this Subcommittee last April to address this issue, and, at that time, we stressed the need for immediate action. We have also been involved with the deliberations of the Arctic Goose Joint Venture and the Stakeholders' Committee on Arctic Nesting Geese, and the association has endorsed the recommendations of both of these groups.

The association continues to be concerned that snow goose populations are expanding at an average rate of 5 percent a year and now exceed five million breeding birds. This overabundance of snow geese is attributed mainly to changing agricultural practices on the wintering grounds and the coastal areas along the Gulf of Mexico and throughout the Central and Mississippi Flyway migration corridors. These practices, as you have heard, have inadvertently increased the food available to snow geese during migration and wintering periods.

Scientists and wildlife managers agree that Mid-Continent lesser snow geese have become so numerous that fragile tundra nesting habitats along the Hudson and James Bay coastal lowlands have been severely degraded or destroyed. This is a serious ecological problem affecting all indigenous species of flora and fauna, thus decreasing the diversity of these biological communities.

There are indications that other bird species, such as shorebirds and other waterfowl that nest in these areas, are already in decline because their breeding habitat is being destroyed. As snow goose populations continue to increase and brood rearing habitat declines, birds are dispersing to adjacent areas, and the zone of damaged habitat is spreading. Population levels are now well above the sustainable levels for the Arctic and sub-Arctic habitats upon which they depend. In addition, as carriers of avian cholera, snow geese are a potential health threat to all other bird species that share their nesting or wintering habitats. Furthermore, as you have heard, reports of damage to agricultural crops that lie along the migration route between these areas are also increasing.

As you have heard, the snow goose population has now become a threat to itself, and without immediate action, ecological damage in affected habitats could be catastrophic. There is credible and mounting evidence to substantiate that this damage could, in fact, be permanent. Habitat recovery in areas that are not even permanently damaged will take decades or even centuries to recover.

Resource managers have a responsibility and an obligation to protect this fragile habitat through the appropriate measures to control the escalating snow goose population. To let nature take its course for snow geese is neither acceptable nor responsible. If the adult snow goose population is not reduced to appropriate and self-sustaining levels in the very near future, millions of geese will die from starvation and disease. Should the population crash in this manner, it is likely that snow geese would not recover because of long-term or even permanent loss of the habitat necessary to support the rebuilding of these populations.

The association concurs that effective management measures must be directed towards reducing adult bird survival. The Mid-Continent population must be reduced by approximately 50 percent of its current size. To do this, the association concurs with the alternative regulatory strategies adopted by the Service. Under the authority of this rule, States, through their State fish and wildlife agency, will be able to develop and initiate aggressive harvest management strategies. An increase in harvest will assist with habitat management on the wintering grounds and relieve both population and habitat pressure on the Arctic breeding grounds. Remedial actions must be applied now. Any delay may result in consequences that are significant and, in some cases, virtually irreversible.

One other point we would like to make, Mr. Chairman, is that there is a decided lack of funding for goose management and, in particular, snow goose management programs. The need for better biological data, enhanced habitat management, and intensified population management is increasing while Federal dollars for natural resources are decreasing. The Joint Flyway Councils on which sit all 50 State fish and wildlife agencies, have recommended a budget increase of approximately $5 million to the Service's budget to adequately address goose population monitoring, management, and research needs. The association fully supports this request and also urges the support of this Subcommittee for that request.

Again, Mr. Chairman, thank you for the opportunity to share our perspectives, and I would be pleased to address any questions you might have.

[The prepared statement of Mr. Taylor may be found at the end of the hearing.]

Mr. SAXTON. Mr. Taylor, thank you very much for your testimony.

We now move to Dr. Vernon Thomas.

STATEMENT OF DR. VERNON THOMAS, PROFESSOR OF WILDLIFE AND MANAGEMENT, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF GUELPH, GUELPH, ONTARIO

Dr. THOMAS. Thank you, Mr. Chair and members of the Subcommittee. I appreciate the opportunity to appear here today.

First, I will give you my credentials. I am a professor of zoology at the University of Geulph in Ontario, Canada. I have been in that position for the past 25 years. I teach at both the undergraduate and graduate level in animal ecology, ornithology, fish and wildlife management, and areas of applied resources policy. On the research side, I have conducted research in the area under question, James and Hudson's Bay. I have worked on the feeding

ecology of snow geese and Canada geese in this region. I have published on those results in international journals. I have done work in that area in the wintertime, spring, and fall; I know it well. For three consecutive springs, I have lived with the native people as they took geese in the spring. I am also involved in the development of non-toxic shots for the past 5 years, so I have a certain sympathy with the ammunition and hunting industry. On a personal level, I am a shooter. I have shot in five countries, and, at this point in time, my kill of geese is just below 400. Those are my credentials and I believe my basis for appearing here today as an expert in this area.

Let me begin by saying that I take a somewhat different view of this issue compared with the Service, and the differences lie in the fact that I have taken a more long-term ecological approach to this issue rather than a short-term approach and an approach which is based on the somewhat outmoded style of single species management as opposed to ecosystem management. Central to this issue, as you have heard already, is the idea that there is a huge agricultural subsidy in the United States which is burgeoning this population. Now, I would say that that is, perhaps, true, but, yet, overexaggerated for two reasons. There is no empirical evidence that numbers of white geese have ever been controlled or limited by their winter habitat conditions. This is a belief, an assumption, that is being used in this case. Secondly, there is the statement that these birds, fed on prairie grains, go up into Canada fat and then continue to breed at much, much higher levels. I contend there is no carryover of this prairie grain effect into the Canadian lowlands. In fact, published data have indicated that for the past 19 to 20 years, there has been a reduction in the clutch size; that is the number of eggs laid by females in the southern Hudson Bay population of snow geese, and that is a very significant decline in their reproductive output over that time. In other words, I feel that on those two counts, the impact of agriculture, while real, has been, perhaps, overexaggerated.

The goal of this management plan it has given is to conserve Canadian Arctic habitat. Now, I would say that while we have heard and seen many statements that geese are causing destruction, damage, and periling an entire ecosystem, I would argue that as an ecologist that those are somewhat sensationalistic statements. Yes, geese do have impact on vegetation; that is their natural role, but there is an alternative ecological explanation. The role of geese in this situation, particularly when their grazing is heavy, is to cause change; change in the nature of those plant species' composition of the lowland vegetation over time, and I emphasize here that we should not confuse change in plant species composition with destruction of an ecosystem. That is not, in my professional opinion, the case.

We have seen what geese in this area have gone through over the millennia. Three successive waves of glaciation and retreat. A thousand years ago, the major warming trend that afflicted North America, 500 years ago, 300 years ago, the little Ice Age, and now, we are in another warming period. In my opinion, over the millennia that these geese have existed, they have not suddenly become delinquent in the last two decades.

In the reports that you have seen, we have not seen much evidence given or stated about the role or the uplift of these lowlands in creating new habitat each year. The Hudson Bay area is, perhaps, one of the most dynamic parts of North America, and new habitat is being created every year at an astonishing rate of approximately 15 to 25 yards of new shoreline above the tidal zone. This is soon to be occupied by geese every year.

This population of birds, as do all animals, has the capacity to regulate its own numbers. It is happening at Hudson Bay for the last 15 to 20 years that we know of. We see it in the form of lower clutch sizes; fewer gosling surviving; smaller adults that are produced from these areas where grazing is affected. We have seen major dispersal. These are natural processes, yet this is being dismissed by government. Government has said that if we allow this population to undergo natural self-regulating processes, it will crash, and, again, there is no implicit—there is no empirical evidence for such a behavior of populations in the wild. This is a native population in its natural habitat. It is unconstrained; it can move, and I would argue that this population, when stabilizing, will not crash.

You have seen the point made that a burgeoning population of geese is going to cause enormous damage to other species, disease. Well, these snow geese and Ross' geese already number five to six million birds; they travel in huge flocks, and if disease such as cholera, enteritis, and others were to outbreak, I must argue that it would have already happened on a major, major scale; it has not.

The idea of displacement has been based on the idea of two reports, somewhat contradictory, incidentally; the latest one saying that 9 out of 35 species looked at have undergone change while the other 26 have not. There is no conclusive evidence of widespread decline in another species, and I would actually take this report and read to you one statement that has been overlooked very frequently. The authors say, "We have found no compelling evidence that these impacted species are declining on larger spacial scales." Therefore, I say, that we should not use the preliminary report based upon one very, very small geographic area to indict at least two-thirds of the continent's snow geese.

My last point is that as an ecologist I see evidence of ecological processes fashioning populations very adaptively over time. We should allow that process to continue. This is not to deny hunting its role. Where appropriate, where populations have grown and grazing is heavy, natural selective factors can fashion that population of birds far more effectively, far more adaptively than any hunting can do, particularly thousands of miles from the places where it needs to happen. And I would suggest that we focus management in areas where there are species that need, perhaps, a lot more attention and dollars—pintails, scaup.

In conclusion—and I will make this very, very quick—I, as an ecologist, see this goose issue as not a problem for nature, but, perhaps, one for managers. And my last statement is that as an ecologist if I cannot agree scientifically with the definition of the problem, then I cannot agree with the specific nature of the solution. Thank you, Mr. Chairman.

[The prepared statement of Mr. Thomas may be found at the end of the hearing.]

[The information may be found at the end of the hearing.]

Mr. SAXTON. Thank you very much, Dr. Thomas.

Dr. Alison, would you do me a favor? I am just curious, would you pronounce the name of the city that you are from, please? I don't say that to be smart, I just am very curious.

Mr. ALISON. It is pronounced Orillia.

Mr. SAXTON. Say it again, please.

Mr. ALISON. Orillia.

Mr. SAXTON. Orillia. Thank you very much. You may proceed.

STATEMENT OF DR. ROBERT ALISON, ORILLIA, ONTARIO, CANADA

Dr. ALISON. Thank you very much for allowing me to speak today. I, too, will start out with mentioning my qualifications. Just to correct the record, I am not with the Humane Society; in fact, I am not with any pro-hunting or animal rights organization at all.

Mr. SAXTON. Thank you very much.

Dr. ALISON. I am here as an individual with Ph.D. in ornithology; did my research on Hudson's Bay. I have been going to the area under discussion today for 30 years. I lead nature tours there, have done that for 15 of those years. I was involved as a professional waterfowl manager for 10 years, committee chairman in both the Mississippi and Atlantic Flyway for 7 of those 10 years, and I was Ontario's voting representative in both of those flyways throughout that period. In that capacity, I had quite an amount of effort and time devoted to lesser snow geese. I was on the Snow Goose Committee in the Mississippi Flyway for 5 of those years. On the other hand, I am also a hunter and a sportsman, and I am the editor of Canada's largest circulation hunting magazine. So, I guess I try and see this predicament from both sides.

It is quite true that there has been a rather significant habitat change, deterioration, in Arctic Canada. An area of approximately 200,000 square miles on the west and south coast of Hudson's Bay which in the mid-seventies was lush and green is now brown and dry and appears dead. There is enormous interest in what has caused this deterioration or this change, and I think that, just for the record, I would like to point that I think there has been a slight misunderstanding of the area that we are dealing with.

I have trudged over and flown over this area for over 25 years. Now, this is not lesser snow goose breeding habitat. There is one very trivial colony at LaPerouse Bay that has centered in the area of major concern. The rest of the major snow goose colonies that we are dealing with, of which there are approximately 15, are not in this contested area at all, and most of them several hundred miles away. This is not snow goose breeding habitat that we are dealing with, with the exception of the LaPerouse Bay colony itself, which I will reiterate is a very trivial colony and also a colony of very recent roots.

I think the area that we are dealing with is rather an area that is used by staging geese, fall and spring staging geese, and the part that I find most puzzling is that despite the fact that the habitat has deteriorated and that the geese are blamed for it, it is very

probable and indeed likely from information that the Canadian Wildlife Service has made available, that some of it isn't used by geese at all, particularly the part that is inland. I have some trouble figuring out how geese can damage an area that they don't go to.

This is my main interest for being here. What I would like to suggest is that there are other possible explanations for what has occurred in the Arctic. Vern Thomas referred to isostatic uplift a moment ago. This is a geologic process that causes the land to rise as a result of the melting of glaciers, which in Hudson Bay were in some places over a mile thick. The land was depressed, it is now rising, and this has caused some change in wetland distribution and in entirely wetland ecology, and I have seen that in the 30 years that I have been going there.

Perhaps, as significant as climate change, which is occurring up there, climate change is not only affecting the habitat, but it is affecting the geese. So far, the geese have been unable to adapt their breeding strategy to the changes in climate that are occurring. The last year, for example, the geese nested too early; they were fooled by the warmer weather, and, as a result, when the goslings emerged, there wasn't enough for them to eat, and there was rather large scale starvation. This may or may not be a case of the birds adapting to these changes.

The Arctic summer is now approximately 2 weeks longer than it was 20 years ago. The temperature has risen approximately five degrees centigrade in the past 20 years. These are enormous changes; Nature doesn't like abrupt change, and I think that species are having a difficult time adapting to it.

I think the bottom line is that these birds are in the process of adapting to something that is very far-reaching. I think it is dangerous to extrapolate the findings at one small colony so as to appear to apply to the rest of the breeding population. There is no data, no data whatsoever, to suggest that any of the other breeding colonies are eating themselves into oblivion as has been suggested for LaPerouse Bay.

Having been to LaPerouse Bay many, many times, I will admit that the core of the colony seems to be deteriorating, but I would say that the other colonies have not been proven to have that kind of deterioration, and so I would say that it is dangerous to blame the geese for what is occurring there.

I guess to summarize, I would like to say that there are many, many more important processes that are occurring in this area that I think should be of much more concern to the governments of Canada and the United States, and I would be glad to deal with those if I have time, but the final point I would like to make is that, in my capacity as an editor for a major hunting magazine, there is some concern among Ontario sportsmen that the process of establishing what amounts to a war on snow geese may give hunters a black eye. I, in fact, share that fear, and, secondly, I don't think that it is possible for the sportsmen of the United States and Canada combined to kill enough geese to make much of a difference even it is established by the rigorous research that I would recommend that these birds are, in fact, doing the damage that they are purported to do.

Thank you, Mr. Chairman, for allowing me to make these comments.

[The prepared statement of Mr. Alison may be found at the end of the hearing.]

Mr. SAXTON. Dr. Alison, thank you very much, and I apologize for mischaracterizing your appearance here by mentioning the Humane Society, and we will certainly get that right in the record. Thank you.

Dr. Tom Adams.

STATEMENT OF TOM ADAMS, SENIOR POLICY ADVISER, NATIONAL AUDUBON SOCIETY

Mr. ADAMS. Thank you, Mr. Chairman, for upgrading my credentials. I am not a doctor, but I appreciate that.

On behalf of the more than one million members and supporters of the National Audubon Society, we appreciate the opportunity to testify today here, and we are also representing our 520 chapters.

I have to admit I am relatively new to this issue. Probably the person in our organization with the most expertise is currently tied up in our internal version of an omnibus conference committee, which is our annual budget meetings, so he regrets not being able to be here; that would Frank Gail.

In the time that I have been looking into this issue, I have also been preparing my taxes, and I am probably one of the few Americans who will say taxes are not that complicated, especially compared to this.

I know our statement is in the record, and there is just a few points that I would like to touch on that other witnesses have done, so I will expedite what I had planned to say and just associate myself with some of the remarks. Audubon feels that the science that has been put into this decision is credible, and we support its findings. We also want to associate ourselves, especially, Congressman Pickering made a remark about the impact this is having on other species, and the habitat depletion in both areas, and that, I think, is our primary concern is that there is more than one species at risk here, and so we support the action while recognizing, as others have said, a more comprehensive solution or approach is going to be needed to get to the heart of this matter, particularly in the winter habitats and the expansion of agriculture that a number of witnesses have testified towards.

Just a few quick few points, and I do want to go through in here in order to—one of the ironies, I think, of this issue and what we are looking at is as the amount of habitat is being overgrazed and overgrubbed in the Arctic, you are seeing a pattern where the population is just expanding, fueled in part by the winter habitat. I couldn't help but find that sort of being analogous to the issue of sprawl in that we are just continuing to expand habitat in a lot of communities that is affecting wildlife, and I think at some level you have an analogous situation with the expansion of the snow geese habitat.

We also, I think, share Congressman Gilchrest's concern. Several of us in our DC office have been out there and witnessed the winter populations, and we see a similar situation arising there.

In closing, I would just summarize, once again, that we appreciate the Subcommittee having this hearing and looking into this important matter in that we see more broader actions that are going to be needed to get this issue under control, and we stand ready to help in that effort, and we, again, just urge this Subcommittee to look for and encourage the Fish and Wildlife Service to look to means beyond just hunting, which we don't think will accomplish the goal, and with or without hunting, there is the possibility of a crash of the species occurring. So, we urge you to help the Fish and Wildlife Service in a more broader approach to this problem. Thank you.

[The prepared statement of Mr. Adams may be found at the end of the hearing.]

Mr. SAXTON. Thank you, Mr. Adams.

Dr. Bruce Batt.

STATEMENT OF DR. BRUCE BATT, CHAIR, ARCTIC GOOSE HABITAT WORKING GROUP AND CHIEF BIOLOGIST, DUCKS UNLIMITED, INC.

Dr. BATT. Thank you, Mr. Chairman, for the opportunity to share the views of Ducks Unlimited on this issue. I am chief biologist of Ducks Unlimited in Memphis, Tennessee, and I am also chairman of the Arctic Goose Habitat Working Group. This is the group that produced the report that Dr. Rogers presented.

The Working Group developed two scientific reports that are the basis for decisions by the U.S. and Canadian governments to reduce the numbers of geese to levels that can be sustained by their environment. This Working Group consists of 17 public agency, university, and non-government organization scientists and natural resource managers. I have been in this field for over 30 years, and I rate this as the strongest group of professionals ever drawn together to analyze a goose conservation issue of such scope and consequence. Our work was objective and very critical in coming to solid conclusions. Technical review by other peer scientists has resulted in the broad-based agreement with our conclusions about the cause of the problem and the need to reduce numbers of geese to a sustainable level.

Your invitation asked us to address three questions. The first was to review the impact the overabundant geese are having on the ecosystems, and I think you have got a reasonable look at that already. Agriculture is the main factor we believe that drives increased survival of adults and young during the winter, and it also assures that the adults return to their breeding grounds in excellent conditions every year, because their last stopping point on the prairies is from agriculture and then to the tundra. Their condition on arrival is a very important detail here, because the nutrients that they bring with them in their bodies is what goes into their eggs, and it is what the females use to sustain them through incubation. When they get to the Arctic, however, they continue to feed, and the local destruction of the habitat there means the clutch sizes decline, because that is where they top up for the nutrients that they use when they get there. We can go on with some of these technical details, but I won't take you into that for now.

Ever-increasing numbers of geese are returning to this habitat year after year. The best studied area is an 1,100-mile strip of salt marsh habitat; it is not trivial piece of countryside. Thirty-five percent of it has been destroyed; 30 percent of it has been damaged and so on. This is clearly not a localized problem as a very few individuals have claimed. And destroyed is the correct term, because the process of devegetation of the salt marsh results in changes in soil chemistry that present the goose food plants from becoming reestablished.

There is no doubt that the Hudson and James Bay salt marsh ecosystems are in peril. Goose enclosures placed in an already destroyed marsh 15 years ago have not been revegetated. This strongly supports the conclusion that this damage is effectively permanent.

Assertions that natural mechanisms, such as isostatic rebound, will help solve the problem are not correct. Once the geese have destroyed the entire coastal marsh, there will be no source of propagules that can colonize the newly-emerging coastal area. The optimism that isostatic rebound may solve the problem is further negated by the reality of sea level rise which will soon be flooding salt marsh as fast as it emerges. Likewise, the contention that climate change and isostatic rebound may be the cause of the problem is not supported. A simple reality check shows that all the Arctic is subjected to these same two forces, but the only place that ecosystem destruction occurs is where there are unsustainable goose numbers.

Scientists, on the largest northern breeding colonies away from Hudson Bay coastline, see similar ecosystem impacts. Quantification of those impacts is underway now through the use of satellite images on which the damaged areas are easily seen from space. However, there is no doubt among the scientists on the ground that the damage has been enormous. In some areas, they see horizon to horizon devastation. The finite amount of suitable snow goose breeding habitat is rapidly being consumed, and it will be lost. The lessons being learned on the Hudson Bay lowland salt marsh ecosystem provide an unambiguous model of what will happen in other Arctic ecosystems if this problem goes unchecked.

The destruction of these areas is manifested by low survival of goslings, because there are no food plants to eat when they hatch. If you go to colonies along the Hudson Bay lowlands, you will find hundreds of dead and dying goslings. I have done it myself at Cape Henrietta Maria and LaPerouse Bay. I could have found thousands as they were so abundant that the scavengers can't keep up with them. If these populations are not controlled, millions of young will die each year.

In most animals, what we call density-dependent population regulation would have occurred because of lowered reproduction caused by lack of food. The twist on this story is that the geese are mostly free from local conditions, because they return from the South fat and nearly ready to breed because of agriculture in Canada and the U.S. adults and broods also move to other areas causing a wave of destruction up and down the coast as the remaining salt marsh disappears. As a result, population regulation mechanisms are reducing numbers on some colonies by killing the young,

but the overall population continues to grow as colony boundaries expand. But, note again, there is a finite amount of habitat in which to expand. After all 1,100 miles of the Hudson and James Bay salt marshes have been destroyed, the geese will decline but at the price of a whole ecosystem.

Extensive collateral damage will occur, because the collapsed ecosystem will no longer be able to support other wildlife species, especially migratory waterbirds that use this area. As unhappy as the forecast is the geese, in the big picture, the collapse of an ecosystem is an even more serious consequence. Most of these other species are not threatened or endangered, but major segments of the population depend on the coastal salt marsh. These are the true birds of the Americas as the countries of North, Central, and South America all share them.

We conclude that goose populations were unlikely to have been at these levels for at least the last several centuries. There is no evidence from recent recorded history that we can only objectively reason what might have happened previously. Our rationale is simply that most of these geese are sustained for two-thirds of the year by agricultural crops that were not there until this century.

We believe it became possible for the geese to move from their traditional marsh habitats when new food resources became available on the farmland. For example, the Mississippi Delta consisted of 25 million acres of forestland in 1900. Clearing for agriculture accelerated through the 1970's and today only 3 million acres remain. Rice, winter wheat, and soy beans dominate that landscape now in Louisiana, Mississippi, Arkansas, Tennessee, and Missouri where it was once forest and where a large portion of Mid-Continent lesser snow geese now live in the winter. These are perfect goose foods that did not grow in the forest, and the geese couldn't live there. The geese could not have thrived as they do now on most of the North American landscape until agriculture came along. The winter habitat was simply not there to allow them to grow to numbers that they are today.

Managers should intervene to prevent the continued growth of this problem, because it is caused by changes that, although unwittingly, we have wrought on the North American continent. To fail to do so would be an abrogation of our most fundamental responsibility to conserve the biodiversity of life in the ecosystems that we influence.

The second question was how successful Fish and Wildlife Service actions to reduce the size of the white goose populations would be. I can only speculate as the first conservation order is still in effect, and we just don't have the data yet. There are plenty of restraints on this first effort as it was not authorized until late in the winter which was short notice for hunters and outfitters to become engaged in the harvest. The cultural shift of hunters participating at this time of year will also take time to develop, and all jurisdictions were not able to fully participate. Nevertheless, the harvest is underway. I believe we will learn after the final data are in hand that enough birds were harvested to verify that future seasons with this year's restraints removed should, indeed, be able to get the job done.

The third question was about additional steps that might be taken if the current activities are not successful. This would involve direct culling of the population by management agencies. This is a distasteful prospect with profound political and economic consequences. It is hard to conceive of an army of paid government employees trapping and euthanizing geese whether it occurred in Texas, South Dakota, Manitoba or the Northwest territories. Planning for this eventuality has not proceeded very far, because a reasonable test of the much preferred current methods will take a few years.

Everybody with a honest concern about the future of these precious resources hopes deeply that increased harvests will do the job. It is not clear that the necessary political and economic support can come together to allow direct culling by the government. It is far more prudent, economically and politically, to maintain and improve the current course, and it is crucial to do so without delay. Every technical, administrative, legal, and political delay just adds to the problem. There is urgency here as we may not be far from the point where it is simply too late to intervene effectively.

We also know that other goose populations are benefiting from agricultural crops and growing to unprecedented numbers. Thus, it is critical that we learn as much as we can from this first experience with overabundant geese, because we are facing the same thing with numerous other populations in the near future.

We must not leave our role in this challenge to be reduced to only recording for history the crash of the geese and the ecosystem destruction that looms in the near future. We must address this issue with a full commitment to solving one of the greatest challenges that wetland and the waterfowl conservation has ever faced.

All of us here have an interest in sustaining the magnificence spectacle of snow geese. The actions that are being pursued by the Federal agencies in both countries will help us all successfully assure a bright future for the Arctic geese and the Arctic ecosystems and the other wildlife that are in peril.

[The prepared statement of Dr. Batt may be found at the end of the hearing.]

Mr. SAXTON. Dr. Batt, thank you very much. Let me just pursue a couple of questions, if I may.

Dr. Thomas, when we invited you we realized that you have, perhaps, a unique perspective and a different notion about the nature of this problem or, perhaps, that is not even saying it correctly that you don't think it is a problem, and I don't mean to characterize your thoughts, but that is the general impression that I got, and you seem to be in a rather small minority of scientists. I have a resolution here from the Ornithological Council, the Ornithological Union, the Association of Field Ornithologicus, the Cooper Ornithological Society, and the Wilson Ornithological Society endorse the science-based recommendations of the Arctic Goose Habitat Working Group as necessary steps for reducing the Mid-Continent snow goose numbers to a level of about 50 percent of the current numbers by the year 2005. That seems to be a fairly strong statement by a fairly broad-based group of people who are—groups that are made up of members of people who are fairly well-renowned ex-

perts in the field of birds. How is it that you have such a different view of this issue than most others in your profession?

Dr. THOMAS. There are several points to respond with them. First is that when we deal with this whole issue of birds, particularly geese in Hudson's Bay and the ecology of the lowlands, there are very few people who actually have been working there professionally. The report that has been entered into evidence today, Arctic Ecosystems in Peril, has probably been written by no more than about six or seven authors in total. There is one primary botanist in that whole region together with his students. A lot of the people who are in the wildlife profession are not particularly competent in plant ecology, and I would argue that what you are seeing here is a report that has been written by a relatively small number of people whose entire professional research experience is confined to this area, is reviewed by, perhaps, a few more, and then given the blanket blessing of the committee, and I think that we are seeing second-hand, third-hand points of view and information being accepted as though it were gospel.

I alluded earlier to the one report that talks about collateral damage and the impact upon other species, and there are one or two statements in here which have never been amplified. We see in this report, emphasis upon species in decline, species in decline, yet if you were to go through this very report you would see greenwing teal up quite considerably. In recent years, pintail ducks going up, black ducks stable, mallards stable, 9 out of 35 species apparently in decline in a very restricted part of the sub-Arctic.

A lot of people don't go back to the fundamental data. A lot of people don't have the first-hand experience with this area, and this is why I think it is easy for a particular position to become pirated across many groups.

Mr. SAXTON. Dr. Batt, you just heard your report challenged. Would you like to respond?

Dr. BATT. That was not a report that was part of the Arctic Ecosystems in Peril; that was something that was done subsequently with bird observation data collected over 25 years at LaPerouse Bay, and we agree that the decline of the species that have been measured to decline at LaPerouse Bay, none of them are in endangered or threatened, and a lot of them live in other places. I see them basically as canaries in the coal mines. As the ecosystem collapses and a large subset of these species can no longer live there, some of them—I think John mentioned the yellow rail—have disappeared, and some of these species can't live there, it tells you that this is becoming a dysfunctional ecosystem, and there is new work underway. There are graduate students that are now working on some of these issues. This was not anticipated many years ago that these data would be important and would ever be used for this purpose. So, the use of those data was an extension of them, really, beyond what they were ever intended to be used for.

Mr. SAXTON. Thank you. Dr. Batt, Dr. Alison takes some issue with the notion that the damage to the tundra and the ecosystem is due to overgrazing by snow geese. I have a copy of your report here where you studied this very notion with enclosures that were intended to keep snow geese out of certain small areas while they were free to graze in adjoining areas, and the enclosed areas ap-

pear to have remained healthy as much as the geese couldn't get to them, while the other areas appear to be decimated would be the correct word. Would you comment relative to Dr. Alison's notion on this subject?

Dr. BATT. Well, this whole region is undergoing the process of isostatic uplift, and it is undergoing some degree of climate change. The difference between the green areas inside these enclosures and the devastated area outside is that the geese are outside. This whole—inside and outside are both undergoing the same process, but it is not correct that when you look inside that this is what the tundra would naturally look like. This is an ungrazed area. Geese are part of the system, and this exaggerates the contrast, but it does show that outside the area it is destroyed; inside it is not. To me, there is a picture that is not shown in the report which is more devastating, and that is an area where an enclosure was put in that had already been destroyed about 15 years ago to see how long it takes for it to come back, and 15 years later nothing has responded. So, to me, that is even a more serious issue.

Mr. SAXTON. Thank you. Mr. Taylor, there has been some discussion as to the effectiveness of the current new regulations that will suspended here apparently for the next season because of the court's action. Do you have any information to share with us that would indicate that population control measures undertaken by the new regulations will be successful to the extent that you believe it will solve the problem that we experience and move to, in fact, the recommendation of the statement of the ornithologists that the current level of reduction of 50 percent by the year 2005, is that a realistic goal?

Mr. TAYLOR. Mr. Chairman, I think it is a goal that we need to strive for. If you recall, as Dr. Rogers indicated, we don't have data yet on success of the implementation of the conservation order for this season that started late. I am not sure of the exact number of the States that have taken advantage of that. There are logistical requirements for putting in place some of the measures that are provided for under the rule. Nonetheless, we do believe that this is a very appropriate and measured response and should be given the opportunity to be substantiated as to what effect it has had, and if, as anticipated, preliminary indications suggest that this by itself will not solve the problem, then we believe that the resource agencies need to deliberate further on other, as Mr. Rogers characterized them, more draconian measures that may be necessary to control this population.

Mr. SAXTON. Dr. Alison, for one, in his testimony, questioned whether hunting would be an effective tool. I understand that basically you have done several new things. One is to provide for unplugging of shotguns; two is to provide for the use of electric calls, and I guess three would be to increase the bag limit, is that correct?

Mr. TAYLOR. To provide for, also, an additional season outside the frameworks, and, again, I think that this is a very appropriate and efficient way of attempting to bring some management to these numbers. As many have alluded to, the logistics of population management in the Arctic are pretty formidable. The cost of implementing measures up there, I don't know that anybody has good

estimates of. So, it makes sense to us that using sportsmen, by allowing these type of opportunities under the appropriate oversight of the Federal and State fish and wildlife agencies, is very cost efficient, and we will determine how effective it is to bring some management to this population.

Mr. SAXTON. Have other measures—I guess, maybe, Dr. Batt would be the appropriate person for me to pose this question to. There have been suggestions that, perhaps, activities in the breeding—human activities in the breeding ground, such as egg collection or egg shaking, would be something to look at. I am sure that that is not a new notion; I am sure you have examined these issues. Can you comment relative to that approach?

Dr. BATT. In our report, we did some mathematical modeling looking at what stage of the annual cycle we could be most effective at reducing the population and what would happen at all the different stages throughout it, and far away the most effective way to reduce adult survival—other factors like scaring the birds so they wouldn't lay as many eggs or wouldn't use as much food or destroying the nests or such matters like that. We calculated, actually, that it would take something like 1.8 million eggs to be destroyed to stabilize the population, and that wouldn't bring about any decline, and that would have to be done for at least 7 or 8 consecutive years, because that is about how long adult geese live is about 8 years. There is no practical mechanism to do that; there is no communities nearby. This is all remote work with helicopters and with associated costs and dangers and everything else. There really isn't a sensible way to go about doing this.

Mr. SAXTON. And if the current regulatory scheme doesn't eventually kick in and work, what then?

Dr. BATT. I believe the current scheme will work, and I will just give you a little data. Four or 5 years ago, there was only about 400,000 snow geese being killed in the U.S. and Canada in the hunting season. In the last couple of years, there has been 700,000 to 800,000 killed. The only change was that the duck population came back; more people went duck hunting, and there was more incidental contact. There was some changes in the rules relative to bag limits and that sort of thing, but the harvest went up with pretty benign changes. Now, with these more significant changes, it should not be big deal to double and triple the harvest with these new measures that are being allowed at the end of the normal season and through the spring, and when they get kicked in Canada, too, we think that will help do the job.

As far as what next, in my statement, I said, I guess we don't know. That is going to take a while to figure out. We believe that it is most crucial to follow through on the current plan, and evaluate it, and find out, in fact, if it will work. Let us find out; let us get some real world experience by doing and learning as we go.

Mr. SAXTON. But it sounds like the problem is that unless—the problem is that unless everybody agrees there is a problem, we wouldn't want to try to solve the problem, because there is none.

Dr. BATT. Right, well——

[Laughter.]

[continuing] I believe that there is a problem that we should solve, and I think that the path that we are on is the correct one for this stage of the process.

Mr. SAXTON. Dr. Thomas, am I characterizing you correctly? Do you believe that there is not a problem? I think that is the crux of your testimony, is it not?

Dr. THOMAS. I agree that there is an increasing population of snow geese, and I agree that there are areas of the sub-Arctic lower Hudson's Bay which have shown quite heavy levels of grazing by geese. What we define as the problem is, is it a problem for management or is this a problem for the geese that they are unable, incapable of resolving this at a population genetic level? I am convinced that snow geese, as has already been shown over the last 15 or 20 years, can begin to stabilize to numbers as resources become limited, and I would say that you would expect to see this self-regulatory process become more extensive, more intensive as the months and years go by. I have full faith in the ability of geese to undergo mortality, reproduction regulation in such a way that it shapes that population deliberately and very adaptively for the years to come in a very dynamic, changing environment.

Natural selection operates on a population which is very often not readily apparent to us. It is not random; hunting is.

Mr. SAXTON. Let me ask this, then. I think you started to answer this question by saying, there is an increase in the population which is a problem, yes?

Dr. THOMAS. Well, I don't think it is a problem for the geese in so far as it will arrive at some point at which numbers will stabilize, perhaps, even decline in some areas. I don't think we have reached that point yet. It is a little bit like people in an economic sense saying, "Well, heck, the dow isn't going go to above 10,000." It has, and they are surprised. I think we are seeing surprise on the part of managers that geese have gone above 5,000; they have. Clearly, there are resources that support them. Geese seem to know more about their habitat than we, as managers, do.

Mr. SAXTON. Let me ask this: Do you think there is any room in this process at all for agency management of snow geese?

Dr. THOMAS. I think you already have some of it in the form of ongoing spring hunts—I am sorry, ongoing fall hunts.

Mr. SAXTON. Do you support those hunts?

Dr. THOMAS. As an individual—and I will remove myself here from representing the views of the Humane Society of the United States—as an individual, I have no problem with fall hunting. I think that I have yet to see a really valid, compelling reason to introduce, for the first time since quite a large number of years, a special condition for spring hunting.

Mr. SAXTON. I see.

Dr. THOMAS. Because I am convinced that those goose populations will stabilize at some point. I have no reason to suspect that geese are going to be totally different from any other animal species on this Earth.

Mr. SAXTON. Do you agree or disagree with the notion that the food supply has significantly changed within the lower 48 and that they, therefore, tend to live a longer life, and, perhaps, a healthier life?

Dr. THOMAS. I agree that there is an enormous amount of grain. I would contend that, perhaps, what we are seeing is a placement of natural non-agricultural types of food that may have prevailed throughout the 1800's and before and, perhaps, into the early 1900's. So, what we could be seeing is an agricultural exchange for wilder types of food which disappeared when so much land was cleared by agriculture in the U.S. I agree that there is a subsidy; I would agree that, perhaps, geese are living, perhaps, a little bit longer, but to contrast my view with Dr. Batt's, I do not think that this is resulting in enhanced rates of reproduction in the Arctic. As I have indicated before, there is a significant long-term decline in the clutch size of birds laying in southern Hudson's Bay, and that, the authors of the report contend, is due to food shortages there.

Mr. SAXTON. Well, let me just back up a couple of thoughts there. If there are more birds—we know there are more birds, and you just indicated that they are living somewhat longer. If there are more big birds to make little birds, doesn't it automatically mean there will be more baby birds?

Dr. THOMAS. No, because you are making the assumption that there are more and bigger birds, and I don't believe that——

Mr. SAXTON. Well, you agreed with me.

Dr. THOMAS. No, I disagree that there are more big birds. I would agree that there are, perhaps, more——

Mr. SAXTON. Adult birds, excuse me for using the wrong word, adult birds.

Dr. THOMAS. Yes, there are——

Mr. SAXTON. There are more adult birds.

Dr. THOMAS. Yes, but whether there are more adults breeding in certain parts of the sub-Arctic where habitat is limiting is yet to be determined.

Mr. SAXTON. You mean, you don't think that the fact that there are more adult birds means that there are more adult birds breeding?

Dr. THOMAS. Not necessarily. I can indicate to you from some of my own data that there are significant numbers of non-breeding adult birds returning in the spring to James Bay. We have not looked at this issue of whether every adult bird is going to be a breeding bird in the North, and this is one of the classical areas of population self-regulation, that not every female may breed in every year. If a female does breed, will she lay the same amount of eggs each year? This is where there is uncertainty; this is where we need to have some more information.

Mr. SAXTON. Well, unfortunately, we are running out of time. This is a very interesting subject, and I would like to and will pursue it in other forms, but we are going to have to call today's hearing to a close. I would like to thank each of you for being here. There may be some members who were here or even some who were not who have additional questions, and, if so, we will send them along to you and ask you if you would answer them in writing. And, so unless there if further business, which there is not because there are no members here, the hearing is adjourned. Thank you very much.

Dr. THOMAS. Thank you.

[The prepared statement of Ambassador Chretien may be found at the end of the hearing.]

[The information may be found at the end of the hearing.]

[Whereupon, at 12:41 p.m., the Subcommittee was adjourned.]

[Additional material submitted for the record follows.]

STATEMENT OF DR. JOHN G. ROGERS, DEPUTY DIRECTOR, U.S. FISH AND WILDLIFE SERVICE, DEPARTMENT OF THE INTERIOR

Thank you for the opportunity to appear today to discuss management activities associated with ecological problems caused by overabundant light geese.

North American geese are a natural resource of enormous economic and social value to both hunters and birdwatchers throughout the United States. Migratory bird hunting, including goose hunting, generates about $4 billion of economic activity annually. Local and regional economies are further enhanced by expenditures of millions of people viewing and photographing geese during migration and winter. Management of light goose populations in North America has presented the wildlife management community with one of its most challenging tasks. In contrast to the efforts to restore wildlife populations depleted by years of market hunting in the late 1800s and early 1900s, we are now faced with managing some populations of geese that have become so overabundant that they are literally destroying their own habitat and a priceless ecosystem. Dealing with this problem has forced the Service to change its management approach to save goose populations from one of population restoration and maintenance to one of population control.

Mid-continent light geese are lesser snow geese (*Anser c. caerulescens*) and Ross' geese (*Anser rossii*) that breed in the subarctic and arctic regions of Canada, primarily along the south and west coasts of Hudson Bay and the southern portions of Southampton and Baffin Islands. These light geese migrate southward in the fall through the Central and Mississippi Flyways. Historically, mid-continent light geese wintered primarily in the coastal areas of Texas and Louisiana; however, today their winter range spans across Texas, Louisiana, Oklahoma, Arkansas, and the central highlands of Mexico.

The mid-continent light goose population has grown more than 300 percent over the last 30 years, from 900,000 birds in 1969 to over 3 million birds today, as measured by mid-winter surveys. These population levels far exceed any historical records. The rapid growth of the population has been primarily attributed to the expansion of agriculture along the Central and Mississippi Flyways, low mortality, and increased winter survival.

Another population of geese that is steadily increasing as a result of increased use of agricultural lands and lower mortality rates is the greater snow goose (*Anser c. atlanticus*). These geese breed in the eastern Arctic of Canada and Greenland and migrate southward through Quebec, New York, and New England to their wintering grounds in the mid-Atlantic U.S. The greater snow goose population has expanded from less than 50,000 birds in the late 1960s to approximately 700,000 today. With a growth rate of about 9 percent per year, the population is expected to reach 1 million by 2002, and 2 million by 2010.

Abundant food resources in migration and wintering areas have fostered rapid population growth in these three species of light geese. However, for the mid-continent population, suitable breeding habitat in the arctic tundra is becoming a limiting factor. This is a direct result of the intense feeding activities of light geese, which leads to the loss of vegetation and an increase in soil salinity.

Due to the short tundra growing season, such habitats may take decades to recover, if they recover at all. Currently, 35 percent of the 135,000 acres of habitat in the Hudson Bay Lowlands is considered destroyed, 30 percent is damaged, and 35 percent is heavily grazed. Other arctic habitats may be suffering the same fate as existing snow goose colonies expand and new colonies are established.

The Service, along with the Canadian Wildlife Service and virtually every credible wildlife biologist in both countries, believes that the mid-continent light goose population has exceeded the carrying capacity of its breeding habitat and that the population must be reduced to avoid long-term damage to an ecosystem important to many other wildlife species in addition to snow geese. In 1997, the Arctic Goose Habitat Working Group of the Arctic Goose Joint Venture recommended that wildlife agencies take steps to reduce the mid-continent light goose population by 50 percent by 2005. There was overwhelming support for this action by the National Audubon Society, Ducks Unlimited, the American Bird Conservancy and other conservation organizations from both countries.

Although the greater snow goose population has experienced similarly fast growth, studies in the high Arctic have not documented extensive damage to breeding habitats as of yet. However, large populations of greater snow geese are negatively impacting agricultural crops in the U.S. and Canada, natural marshes in the St. Lawrence estuary and some coastal marshes of the mid-Atlantic U.S. In a recent report, the Arctic Goose Habitat Working Group recommended that the population be stabilized by the year 2002 at between 800,000 to 1,000,000 birds. Hopefully, this will prevent a repeat of the destruction of arctic habitats that has occurred as a re-

sult of the mid-continent light goose population explosion and stabilize the agricultural damage experienced annually in Canada and the U.S.

An Environmental Assessment of the mid-continent light goose situation was completed by the Service after extensive consultation with State/provincial, private, academic, and non-governmental partners in the U.S. and Canada. Several alternative management actions for reducing the light goose population were examined in the Assessment. The preferred alternative was to authorize new methods of take, namely electronic calls and unplugged shotguns, for use by hunters during normal hunting frameworks, when all other waterfowl and crane seasons were closed. The preferred alternative also advocated (included) creation of a Conservation Order—a special new management action designed to decrease populations—that authorized taking of geese during the normal framework closing date of March 10 through August 31.

In early February 1999, the Service issued a Finding of No Significant Impact along with the Environmental Assessment. The Service subsequently published two rules on February 16, 1999, that authorized use of electronic calls and unplugged shotguns with the restrictions cited above, and also established a Conservation Order for the reduction of overabundant mid-continent light geese. These regulations were made available to the 24 States that comprise the Mississippi and Central Flyways. The Service has projected that an additional 618,000 light geese would be harvested in the first year of implementation of the new regulations in the U.S. In its rulemaking, the Service announced that the new measures represented short-term options for addressing the light goose problem and that in 2000 it would initiate preparation of an EIS that considered a range of long-term solutions to the problem. The timeline for preparation of an EIS was established after consultation with the Council on Environmental Quality.

Several states implemented regulations immediately upon publication of the rules. Based on reports from field biologists, the new regulatory tools appear to be very successful for increasing harvest of light geese. However, due to an unusually early spring migration this year, it is possible that the projected level of harvest may not be realized. Harvest information to measure the effectiveness of these regulations will not be available until later this summer. Recently, the Canadian Wildlife Service implemented similar regulatory changes intended to increase harvest of light geese in Canada.

We have no previous experience to guide us in determining how effective increased harvest pressure will be in controlling light goose populations. To complement harvest management actions, we have initiated land management practices that will increase susceptibility of light geese to harvest and make some lands less suitable for these birds. Regional Action Plans were developed in cooperation with the States and will be implemented over the next 3 years to help reduce snow goose numbers. These plans will focus on five points: (1) providing increased hunter opportunity on public and private lands, where feasible; (2) decreasing food availability for snow geese; (3) manipulating wetland areas to deter snow geese; (4) altering winter habitat; and (5) conducting communication and outreach efforts.

The Service's management action has received widespread support from the scientific and conservation community. Conservation groups such as the National Wildlife Federation, Wildlife Management Institute, the Ornithological Council, American Bird Conservancy, and Ducks Unlimited have expressed strong support for the light goose population reduction program. In addition, Flyway Councils and individual State wildlife agencies have worked closely with the Service to implement management actions.

There have been challenges to the Service's proposed actions. On March 3, 1999, the Humane Society of the United States and several other animal rights groups filed a lawsuit against the Service, challenging the new light goose regulations. The plaintiffs maintained that the Service had violated the Migratory Bird Treaty by enacting the new regulations and that an Environmental Impact Statement should have been completed prior to implementation of the rules. On March 12, 1999, a preliminary injunction hearing was held in Federal District Court in Washington, DC.

On March 18, 1999, Judge Thomas Hogan denied the injunction sought by the plaintiffs. In his written opinion, Judge Hogan indicated that the Service's actions likely constituted a reasonable use of its authority under the Migratory Bird Treaty, and that the population reduction program was based on sound scientific information. However, Judge Hogan stated further that the Service's Environmental Assessment represented a "hard look" at the proposed action that "comports with the spirit of NEPA, though not its letter." The judge concluded that the plaintiffs had demonstrated a substantial likelihood of success on the merits of their NEPA claim if

the case proceeded further, and that an Environmental Impact Statement should have been prepared prior to implementation of the new regulations.

The Service believes that the Environmental Assessment of its light goose population reduction program, and accompanying Finding of No Significant Impact, sufficiently complied with the requirements of NEPA. However, based on the written opinion of the Court, the Service has decided not to continue with litigation and will initiate preparation of an EIS immediately. On April 2, 1999, the Service announced its intention to withdraw the two regulations on light goose population reduction after the northward migration later this spring. It is possible that the time requirements for preparing an EIS may preclude resumption of light goose management actions next spring. If population reduction measures are not implemented during spring 2000, the mid-continent population will experience additional growth that otherwise would not occur. Consequently, our ability to bring the population to more desirable levels will become more difficult. Any delay in further population reduction will allow goose numbers to increase. In order to make the most efficient use of our financial and personnel resources, the Service will incorporate management options for greater snow geese in the analysis, in addition to the mid-continent light goose analysis. The resulting EIS therefore will represent a comprehensive management strategy for white geese in the U.S. that includes lesser snow geese, Ross' geese, and greater snow geese.

The range of management options to be analyzed in the EIS process will likely include the two management options authorized this spring, land management practices, as well as direct management options such as trapping and culling on wintering areas and cominercial harvest. The full range of options to be considered will be determined during the public scoping phase of the EIS process. Because the authority of the Service is limited to actions in the U.S., the Service cannot consider direct management actions on the arctic breeding grounds, such as collecting eggs, destroying nests, or culling on breeding colonies. However, if management actions in the U.S., combined with regulatory changes implemented by Canada, do not result in the desired population reduction within 3-5 years, it is likely that the Service will request that Canada consider more direct measures on the breeding grounds.

The Service firmly believes that aggressive management intervention is a necessary and scientifically sound approach for the control of white goose populations. Without intervention, we will likely witness the destruction of an ecosystem that is important to other migratory birds and other wildlife species. It is also possible that the snow goose population will crash and remain at extremely low levels due to lack of suitable breeding habitat, the spread of disease, and predation.

The Service is committed to working with State fish and wildlife agencies, Canadian wildlife authorities, and public stakeholders to address the critical issue of the overabundance of white geese.

Thank you for the opportunity to speak to you today and for your support for our efforts to deal with these important migratory bird management issues. I would be pleased to answer any questions you may have regarding this issue.

NEWS
from the U.S. Fish and Wildlife Service

April 2, 1999 Chris Tollefson 202-208-5634

SERVICE ACCELERATES SNOW GOOSE STUDY

The U.S. Fish and Wildlife Service announced today that it will begin work this spring, one year earlier than originally planned, on an environmental impact statement that will evaluate long-term options for managing mid-continent light goose populations. By accelerating the EIS process, the Service seeks to more fully analyze information and alternatives, broaden the already strong consensus for action, and minimize disruptions to state wildlife agency planning efforts.

In concert with the compilation of an EIS, the Service will withdraw final rules designed as a short-term measure to reverse ongoing destruction of arctic breeding habitats caused by exploding light goose populations. The withdrawal will occur after the end of the current spring migration and will not affect existing state conservation actions authorized by the rules.

In response to a legal challenge filed by the Humane Society of the United States, Judge Thomas Francis Hogan ruled in favor of the Service on March 19 and denied a request by the group for a preliminary injunction blocking implementation of the rules. He found that the Service would probably prevail on its claim that it acted within its mandate under the Migratory Bird Treaty Act to take emergency measures to protect migratory bird resources.

But Judge Hogan did find cause to believe that a full environmental impact statement, rather than the more concise environmental assessment (EA) performed by the Service, is likely required by the National Environmental Policy Act.

"In respect to the government's decisionmaking process, it is clear that FWS acted in good faith. FWS' EA represents a hard look at the proposed action that comports with the spirit of NEPA, though not its letter," Judge Hogan said in his ruling.

"In his opinion, Judge Hogan acknowledged the thorough scientific analysis the Service and its partners conducted to help resolve this problem and the widespread support in the scientific and conservation community for the rules we are implementing," said Service Director Jamie Rappaport Clark. "We will build on this analysis by completing the EIS that he has suggested."

The rules, which were implemented February 16, gave 24 states the flexibility to allow the use of normally prohibited electronic goose calls and unplugged shotguns during the remaining weeks of their light goose seasons this year, provided that other

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waterfowl and crane seasons have been closed. States were also given the authority to implement a conservation order under the Migratory Bird Treaty Act that would allow hunters to take light geese outside of traditional migratory bird hunting season frameworks after the closure of all other waterfowl and crane seasons.

The Service's action was supported by the Canadian government and a broad spectrum of the conservation community, including the National Audubon Society, the American Bird Conservancy, the Ornithological Council, and Ducks Unlimited. It was taken as an immediate response to an impending ecological crisis caused by rapidly expanding mid-continent populations of lesser snow geese and Ross' geese, collectively known as "light geese."

Increasing agricultural and refuge development along waterfowl flyways through the Midwest and South have provided light geese with ample forage during their yearly migrations. As a result, adult mortality rates for light geese have fallen steadily during the past three decades, triggering explosive population growth.

The fragile arctic tundra, with its short growing season, cannot support populations of that size. Large areas of the breeding grounds around Hudson Bay have been denuded of all vegetation by overgrazing, a situation that scientists believe may also be contributing to the decline of dozens of other migratory bird species that share the breeding grounds and winter in the United States.

The Service had planned to commence an EIS next year, evaluating the long-term impacts of increased harvest and other potential control methods. While the EIS process is a lengthy one, the Service will complete its analysis as quickly as possible. The Service cannot assure that the EIS will be completed in time to support potential management actions in the spring of 2000.

The U.S. Fish and Wildlife Service is the principal Federal agency responsible for conserving, protecting, and enhancing fish and wildlife and their habitats for the continuing benefit of the American people. The Service manages the 93-million-acre National Wildlife Refuge System comprised of more than 500 national wildlife refuges, thousands of small wetlands, and other special management areas. It also operates 66 national fish hatcheries and 78 ecological services field stations. The agency enforces Federal wildlife laws, administers the Endangered Species Act, manages migratory bird populations, restores nationally significant fisheries, conserves and restores wildlife habitat such as wetlands, and helps foreign governments with their conservation efforts. It also oversees the Federal Aid program that distributes hundreds of millions of dollars in excise taxes on fishing and hunting equipment to state fish and wildlife agencies.

STATEMENT OF GARY J. TAYLOR, LEGISLATIVE DIRECTOR, INTERNATIONAL ASSOCIATION OF FISH & WILDLIFE AGENCIES

Thank you, Mr. Chairman. I am Gary Taylor, Legislative Director for the International Association of Fish and Wildlife Agencies. I appreciate the opportunity to share with you the perspectives of the Association on the increase of the mid-Continent lesser snow goose (snow goose) population and the impact they are having on the Arctic tundra habitat. The Association supports the U.S. Fish and Wildlife Service's final rules on the management of Mid-Continent Light Geese (MCLG) [Federal Register, Vol. 64, No. 30, 7507-7529, 16 February 1999], and urges the Subcommittee's support for these actions and for increased funding to the USFWS for monitoring the effectiveness of these conservation measures.

The Association, founded in 1902, is a quasi-governmental organization of public agencies charged with the protection and management of North America's fish and wildlife resources. The Associations governmental members include the fish and wildlife agencies of the states, provinces, and Federal governments of the United States, Canada and Mexico. All 50 states are members. The Association has been a key organization in promoting sound resource management and strengthening Federal, state, and private cooperation in protecting and managing fish and wildlife and their habitats in the public interest.

The Association and its member agencies are very familiar with the necessity for action to address the over population of snow geese that is causing substantial adverse impact on the Arctic tundra. As you may recall, we appeared before this Subcommittee on April 23, 1998 to address this issue and at that time we stressed the need for immediate action.

The Association continues to be concerned that snow goose populations are expanding at an average rate of 5 percent a year. With this level of increase, nesting colonies continue to be impacted and damage to fragile Arctic tundra habitat is expanding annually. As you are aware, waterfowl biologists and wildlife managers have studied and clearly documented the impact of the expanding snow goose population. We are pleased that the Subcommittee is holding this hearing and urge you to support actions to help redress the effects of increasing snow goose numbers on Arctic habitat and the associated biological communities.

Mid-continent lesser snow goose populations, which are an international resource, now exceed 5 million breeding birds. This is an increase since the mid-1970's of more than 300 percent. This over abundance of snow geese is attributed mainly to changing agricultural practices on the wintering grounds in the coastal areas along the Gulf of Mexico, and throughout the Central and Mississippi Flyway migration corridors. These practices inadvertently increased the food available to snow geese during migration and wintering periods. Also the extensive network of state, provincial, Federal and private wildlife refuges provide sanctuaries for snow geese and other migratory waterfowl.

Scientists and wildlife managers agree that mid-continent lesser snow geese, which nest in the central and eastern Arctic and sub-Arctic regions of Canada, have become so numerous that fragile tundra habitats along the Hudson and James Bay coastal lowlands have been severely degraded or destroyed. This is a serious ecological problem affecting all indigenous species of flora and fauna, thus decreasing the diversity of these biological communities. There are indications that other bird species, such as shorebirds and other waterfowl, which nest in the areas where severe damage has occurred, are already in decline because their breeding habitat is being destroyed. As snow goose populations continue to increase and brood rearing habitat declines, birds are dispersing to adjacent areas and the zone of damaged habitat is spreading. Population levels are now well above the sustainable levels for the Arctic and sub-Arctic habitats upon which they depend. In addition, as carriers of avian cholera, snow geese are a potential health threat to all other bird species that share their nesting or wintering habitats. Furthermore, reports of damage to agricultural crops in the states and provinces that lie along the migration route between those areas are increasing.

The status and implications of increasing mid-continent lesser snow goose populations have been addressed by an international group formed by the Arctic Goose Joint Venture (AGJV), which itself is an international joint venture under the North American Waterfowl Management Plan. The State fish and wildlife agencies are well represented on this and other joint Ventures, and have been engaged in the deliberations over solutions to this snow goose resource problem since the beginning. We also understand that the Canadian Wildlife Service and a number of non-governmental conservation organizations in Canada fully agree that snow goose numbers must be reduced to protect the Arctic habitat and the species diversity of that ecosystem.

As you know, the Arctic Goose Habitat Working Group submitted its comprehensive report in 1997 entitled *Arctic Ecosystems in Peril.* The Report documented the ecological problems of the salt marsh habitats found in the Hudson Bay Lowlands, such as desertification, soil salinization and the depletion of vegetation communities. The IAFWA agrees with and supports the findings of that report, which encouraged U.S. and Canadian wildlife agencies to take immediate action. Subsequently, a group of stakeholders from Canada and the United States met to consider solutions to the over population problem. The *Report of the Stakeholder's Committee on Arctic Neshing Geese* (dated March 11, 1998) was accepted and endorsed by the IAFWA Waterfowl subcommittee and Migratory Wildlife Committee at their meetings in March, 1998. We understand that this Committee has a copy of that report.

It must be recognized that the over-abundance of snow geese is a result of changes to the landscape wrought by man, largely as a result of changes in agricultural land use along the migration route. Furthermore, the snow goose population has now become a threat to itself and without immediate action, ecological damage in affected habitats could be catastrophic. There is credible and mounting evidence to substantiate that this damage could be permanent. Habitat recovery in areas that are not even permanently damaged will take decades or even centuries to recover. We have a responsibility and an obligation to protect this fragile habitat through appropriate measures to control the escalating snow goose population. To let nature take its course for snow geese is neither acceptable nor responsible. If the adult snow goose population is not reduced to appropriate and self-sustaining levels in the very near future, in addition to the habitat degradation, millions of snow geese will die from starvation and disease. Should the population "crash" in this manner, it is likely that snow geese would not recover because of long term or even permanent loss of the habitat necessary to support the rebuilding of populations. The Association concurs that effective management measures must be directed towards reducing adult survival. The mid-continent lesser snow goose population must be reduced by approximately 50 percent of its current size. To do this, we agree with the alternative regulatory strategies adopted by the FWS. There is virtually no risk of the alternative regulatory strategies causing over-harvest of mid-continent lesser snow geese within the next several years.

The FWS has adopted the following alternative regulatory strategies designed to increase the harvest of snow geese, in concert with habitat management. The Association fully supports these strategies.

1. Authorize States (through the State fish and wildlife agency) to implement actions to harvest MCLG by shooting in a hunting manner inside or outside the regulatory migratory bird hunting season frameworks.

2.Authorize (through the State fish and wildlife agency) the use of electronic callers and unplugged shotguns during a light goose only season when all other waterfowl and crane hunting seasons, excluding falconry, are closed.

Under the authority of this rule, States (through the State fish and wildlife agency) will be able to develop and initiate aggressive harvest management strategies. An increase in harvest will assist with habitat management on the wintering grounds and relieve pressure on the Arctic breeding grounds. Furthermore, a decrease in snow goose numbers will ameliorate pressures on the habitat of other migratory bird populations that share the breeding and wintering grounds and other areas along the migration routes with MCLG. It is anticipated that a decrease in MCLG populations will also contribute to increased reproductive success of adversely impacted populations of other bird species and reduce the risk of transmitting avian cholera to other species. These management actions are appropriately designed so that an increased take of non-target species should not result.

If these actions are not taken, populations of MCLG will continue to increase and become more unstable as suitable breeding habitat diminishes. Losses to other avian species, from reduced breeding success and avian cholera, may result in reduced hunting, bird watching and other opportunities. Agricultural crop depredation will continue and worsen, resulting in significant economic consequences. Remedial actions must be applied *now*; any delay may result in consequences that are significant and, in some cases, irreversible.

The U.S. Fish and Wildlife Service has prepared an Environmental Assessment reviewing the migratory bird regulations with the intent to significantly reduce snow goose numbers. The Association supports the findings of this environmental assessment.

If these alternative regulatory strategies are not effective, then it is imperative that more drastic population control measures, for example, trapping and culling, be utilized in both Canada and the U.S.

There is a decided lack of funding for goose management programs. The need for better biological data, enhanced habitat management, and intensified population management is increasing while Federal dollars for natural resources are decreasing. The Joint Flyway Councils have recommended a budget increase of approximately $5 million to adequately address goose population monitoring, management and research needs. The Association fully supports this request and also urges the support of this Subcommittee.

In conclusion, Mr. Chairman, the Association firmly supports the regulations to increase the harvest of mid-continent fight geese and we would urge the Subcommittee to support increased funding to ensure that the problem of over-abundance of mid-continent lesser snow geese is appropriately addressed.

Thank you for the opportunity to share the Association's perspectives, and I would be pleased to address any questions you might have.

STATEMENT OF DR. VERNON G. THOMAS, PROFESSOR OF WILDLIFE ECOLOGY AND MANAGEMENT, DEPARTMENT OF ZOOLOGY, UNIVERSITY OF GUELPH, GUELPH, ONTARIO

WHITE GEESE POPULATION ISSUE: AN ALTERNATE, ECOLOGICAL VIEW.

SUMMARY

I do not believe that the growing population of white geese is causing ecological destruction in the Hudson-James Bay lowlands and that a major reduction of the population is warranted to conserve salt marshes. The impacts of feeding by these geese are noticeable, and they constitute the beginning of change in the plant species composition of the community. This change is not to be confused with habitat destruction or desertification, and certainly not imperilment of the ecosystem. The role of waste grains from U.S. agriculture in the bolstering of white geese populations has been exaggerated. Fears that a large population of white geese may transmit disease and endanger other species are not supported by the available evidence. Assertions that white geese will displace other nesting birds from the salt marshes of Hudson-James Bay are not based on a body of consistent scientific evidence.

Lesser snow geese at southern Hudson Bay are already experiencing population reduction due to natural, intrinsic, population-regulation mechanisms. They have been working for at least a decade, and they could bring about a long-term stabilization without the need for extra hunting pressure. The natural mortality induced by these ecological processes is preferable to random hunting mortality in shaping goose populations and ensures their sustained adaptability over time. Populations of white geese have increased recently without much assistance from management and infusions of dollars. These populations will adjust naturally in the absence of management intervention and culling.

The "do nothing" approach to management is preferable in this instance. Then management effort and finances can be re-directed to species whose status warrants intervention.

THE ALTERNATE, ECOLOGICAL VIEW.

The reasons for my disagreeing with the U.S. Fish and Wildlife Service (USFWS) definition of the problem (i.e. habitat damage in the Canadian sub-arctic) and the solution (reduce population size of white geese) are based on my taking an ecological approach within the context of modern ecosystem management. The position of the USFWS and the Canadian Wildlife Service (CWS) lies in the outdated single-species management approach and the untested belief that a lower white goose population size will reverse the trend in salt marsh species composition change. A detailed, scientific, review of this issue with supporting references, appears as Attachment 1,- Thomas, V.G. 1999. Response to "Migratory Bird Hunting: Regulations to Increase Harvest of Mid-Continent Light Geese." Proposed Rule. Federal Register, November 9, 1998. Volume 63, Number 216, pages 60271-60278.

The Agricultural Subsidy to White Geese.

The USFWS argues that the large amount of waste grain left over in the U.S. each year has benefited geese during the Fall and Winter, has reduced the extent of over-winter mortality, and has allowed geese to return in the Spring with greater stores of fat resulting in higher rates of reproduction. The USFWS and the CWS contend that white geese are no longer limited by resource availability on the wintering grounds, and this is the reason for their population growth Ducks Unlimited states that since the waste grain is a by-product of human activity (agriculture), it

behooves humans to deal with the increase in white geese that they believe is caused by the grain subsidy.

There is no documented evidence to support the position that population sizes of white geese were ever regulated by food resources available on the wintering grounds, as opposed to the breeding grounds. This position has been adopted, uncritically, by the USFWS to reinforce their proposal to lower the population size by increasing hunter mortality. Similarly, there is no evidence that snow geese return to the breeding grounds and lay more eggs from their enriched grain-based diet. On the contrary, long-term data collected at the La Perouse Bay colony at southern Hudson Bay show a highly significant, long-term, reduction in clutch size (i.e. the number of eggs laid per female) of snow geese over 1973-1992. The authors of this result (1) suggest that this decline in clutch size may be related to declines in food availability just prior to nesting. This contradicts the view that geese fattened by U.S. grain go on to breed better. If the grain subsidy were to have this effect, there would be no long-term decline in clutch size. Thus, the importance of grain in the Fall-Winter diet of white geese has been exaggerated. While it may promote feeding and survival on the wintering ground, there appears to be no carry-over effect to the breeding grounds.

Geese Cause Habitat Change, Not Destruction.

The position of the USFWS, the CWS, and Ducks Unlimited is that heavy grazing by geese causes habitat damage, desertification, and imperilment of the entire ecosystem. I concede that heavy grazing by geese has an obvious impact on the vegetative community. At low grazing pressures, it maintains the plant species that are nutritious to geese, but under heavy grazing pressure, those species are eliminated or reduced, only to be replaced in time by species that are not nutritious to geese. Thus feeding geese induce change and those changes appear as different associations of plant species in the lowlands of Hudson Bay. This certainly is not desertification or habitat destruction. These changes have probably occurred many times in the past. This species has existed for millions of years in a highly dynamic environment. They have not suddenly become delinquent in the past 20 years.

The report Arctic Ecosystems in Peril (2) contends that the impacts of geese on vegetation may be irreversible. However, statements have been made in the above report and elsewhere to suggest that plant communities will regenerate, but the time for the original plant community to return is not known.

The concept of change in the vegetative community as a consequence of feeding by geese has been addressed in detail by me in Attachment 1, and in my published evaluation of the report Arctic Ecosystems in Peril (3). I have shown, clearly, that vegetative change is not simply a function of geese gazing, alone. In the Hudson Bay lowlands, three factors are inter-acting to determine the vegetative features of goose habitats. Besides gazing, the influences of isostatic uplift and a pronounced, recent, phase of warming climate will influence the species composition of habitats. Isostatic uplift is the physical rising of the lowlands and coastal region at the very rapid rate of 1.0-1.2 in per Century. This impact of raising and drying the land has an enormous impact on plant species composition over just a few decades, quite apart from the gazing, action of the geese. The process of uplift also causes a tremendous amount of new shore line to appear each year (about 15-20 m) from Hudson Bay, and this will soon become feeding habitat for geese. The Arctic Goose Habitat Working Group was so fixated on the idea of habitat loss by heavy gazing that they did not take into account rates of new habitat formation at the supra-tidal zone.

In the videos on geese grazing and salt marsh vegetation produced for the public by Ducks Unlimited, scenes depict the appearance of vegetation in "exclosures" designed to exclude any animal grazing, and adjacent grazed areas. Such scenes portray a contrived, exaggerated, picture. The tall vegetation in the exclosures depicts what would prevail if geese or other grazers were never present. White geese are native species in their natural habitat, so some level of goose grazing must be accepted. The same Ducks Unlimited video also fails to show what occurs when exclosures are built around heavily-grazed areas of salt marsh. There is rapid regrowth of vegetation in 1-3 years. So much for "irreversible damage"!!

Are Snow Geese at Record High Population Levels?

I accept, readily, the population estimates for white geese produced during the past 30 years. They show a real increase in the size of lesser and greater snow goose, and Ross' goose populations. However, the fact that these populations have risen to record high levels in the past 30 years does not negate the suggestion that geese were equally as numerous in past times. I have dealt with this point at length in my report (3). It has been suggested that during the major climate warming that

influenced North America about 1,000 years ago, the population size of lesser snow geese may have been as numerous as during the 1980s. We can surmise, again, that the population size may have contracted during the Little Ice Age that influenced the sub-arctic during the 15-17th Centuries. The recent population increase is also coinciding with a renewed period of warming. Thus I believe that over time, the numbers of white geese expand and contract as climatic events affect their habitats. Given that three waves of glacial advance and retreat have already affected their present-day summer habitats, the current population trend is probably not new in ecological time, even though it is new to goose managers.

Geese and Their Capacity for Self-Regulation.

The view of the USFWS, the CWS, and Ducks Unlimited is that geese numbers have to be reduced for their own good and the benefit of their summer habitat. Such a view gives little credence to the ability of geese to regulate their own numbers, or opines that such regulation may take too long. In the two reports of the Arctic Goose Habitat Working Group (one on lesser snow geese and a parallel report on greater snow geese) there is frequent reference to geese either having exceeded, or being close to, their habitats' carrying capacity. This is a blatant misuse of the ecological term Carrying Capacity. This term properly applies to a population of animals, not their habitat. It is false for managers to estimate the carrying capacity of the population based upon their impressions of the habitat. This is why the statement "exceeding the habitat's carrying capacity" is totally unscientific and illogical. Animal populations determine what the carrying capacity is, and based upon the trend in the growth of lesser snow geese numbers, the carrying capacity is still to be reached at the entire Hudson Bay population level. At a local level, there are many indications that the carrying capacity has been attained and that intrinsic, natural, mechanisms of population regulation are operating, and have done so for over a decade. The dispersal of geese to feeding areas not known to have been used by geese in the past is a natural process of dispersal that typifies all animal life. Lower gosling survival rates have been reported in the literature when broods remain in heavily-grazed areas that do not provide adequate food. In the event that such goslings grow up and enter the adult cohort, their body size is less than that of well-fed geese and, as such, have lower reproductive outputs. These are the self-regulating processes that are occurring already in some parts of the entire population. I believe that they will play an increasingly more important role, both locally and regionally, as the lesser snow goose population expands. These processes are not unique to geese. They typify every animal species in existence.

Do Lesser Snow Geese Pose Threats to Other Species?

This question has been examined by me in Attachment 1, and the conclusion reached is negative, whether on the basis of contagious disease outbreaks, or the displacement of other salt marsh species from Hudson bay. More than 6 million lesser snow geese are believed to exist, and during the Spring and Fall migrations they form aggregated flocks that number in the thousands. Contagious diseases such as fowl cholera are endemic to this species. Were the risks of significant contagion to other avian species real, it would have already occurred, and the wildlife literature would have documented it. Concerns that areas of salt marsh that were heavily grazed by geese may contain smaller numbers of other salt marsh avian species derive from two reports. One report (4), published in 1994, reported that two species were believed to have declined in an area of heavy snow goose grazing. The second report (5), commissioned for Ducks Unlimited in 1997, and conducted in the same area, did not report the same two species as having gone through a decline. Thus there is some inconsistency between what species are affected in the two reports. Report (5) states that there appears to have been a decline in the numbers of some bird species over time. However these authors conclude that: "We have found no compelling evidence that these impacted species are declining on a larger spatial scale."

The simple fact is that there is no sound, independently-confirmed, scientific evidence to suggest that widespread population lowering is being caused by heavy grazing by geese. Moreover, in such a case that there is a local lowering of other species densities, one has to distinguish between local extinction of those animals, and their displacement to other sites where they continue to exist and breed. This has not been investigated to date. The agencies that propose to impose an extra heavy hunting mortality on snow geese have taken this scant evidence of an impact on other species and used it as the basis of the proposed action. The USFWS states in its November 9, 1998 proposed rule that:

> "These declines and other ecological changes represent a decline in biological diversity and indicate the beginning of a collapse of the current Hudson Bay Low-

lands salt marsh ecosystem. Much of the degraded habitat is unlikely to recover."

This is a good example of the hyperbole and sensationalism that has been used to justify the proposed plan of action.

Is the Do Nothing Approach to Management Appropriate?

The USFWS and the CWS both believe that, having identified what they believe to be a real problem, they are compelled to introduce remedial action. Accordingly, both agencies have dismissed the "do nothing" option as inappropriate. I contend that populations of white geese have increased in size in recent years without the benefit of much management intervention and the spending of large sums of money. Insofar as they have also shown the ability to deploy natural population-limiting mechanisms (also known as density-dependent responses), I am convinced that they can regulate their numbers around their population's carrying capacity. If other species do this, I expect native, wild, snow geese in their natural habitat to do it. Thus the white geese issue is more of a problem for North American managers than it is for the geese and Nature. The USFWS has cited one reason for not letting natural regulating processes prevail. It is feared that once the snow goose population has reached its peak, it will quickly crash to very low levels, from which it will recover slowly. Again, there is no documented evidence for this fear. While population crashes have been reported for exotic species and populations under confinement, there is no reason to believe that it will attend snow geese, free to change their distributions in the sub-arctic and respond to local habitat conditions.

The proposal to bring the Mid-Continental population of snow geese down to the North American Waterfowl Management Plan's goal of about 1.5 million birds means that hunting mortality will have to be increased to 4-6 times the current level (i.e. about 1.3-2.0 million geese per year). The continental kill of lesser snow geese has declined in recent years, coincident with a decline in the numbers of goose hunters. If hunters were inclined to take a growing number of snow geese, they might have already done so, especially during the period when the rate of growth was rapid. I doubt that the North American hunters, even with the proposed relaxed regulations, will respond with a 4-6 times increase in goose harvest. If density-dependent population regulating mechanisms are allowed to act throughout the flyway, goose numbers will stabilize at some point. This will involve the reduced survivorship of young and adult geese, as well as reduced reproductive rates for the entire population. Any natural mortality will then be due to diverse environmental selective factors. These factors will, collectively, fashion the snow goose population in an adaptive, genetic manner, ensuring its adaptability to changing conditions over the long term. Hunting mortality does not act, deliberately, in this selective manner and cannot hope to mimic the selective role of natural processes.

As we enter the 21st Century, it is assumed that our wildlife management will progress into ecosystem management and leave behind the older, outdated style of single-species, game animal management. Such a change will mean having to revise society's values towards all wild life, so that the ecological importance of a wider suite of species is realized, not only those that have utility to recreational hunters. Ecosystem management may also entail letting natural processes prevail in population regulation, as we have hitherto for the vast majority of wild animal species. The assumption of managers that they have to intervene and manage is based on the assumption that the management problem to be resolved is valid in ecological terms, and that the path of action is certain to lead to that objective. In the context of the present white goose issue, I cannot agree with the stated definition of the problem and so I cannot agree with the proposed terms of its resolution.

The "do nothing" management option is appropriate in this instance. It will free up management personnel and budgets to be deployed for the better management of those species, such as pintail ducks and scaup ducks, that warrant a greater level of management. It is highly advisable to continue to monitor the different populations of white geese and their habitats, if only to learn more about how the different mechanisms of density-dependent processes operate in wild populations. Such understanding would benefit enormously all future management of North American wildlife species.

(1) "The Snow Geese of La Perouse Bay. Natural Selection in the Wild.' By F. Cooke, R.F. Rockwell and D. B. Lank. Oxford University Press, NY 1995. Figure 6.4.

(2) "Arctic Ecosystems in Peril." Report of the Arctic Goose Habitat Working Group. Edited by B.D.J. Batt. Special Publication of the Arctic Goose Joint Venture of the North American Waterfowl Management Plan. U.S. Fish and Wildlife Service, Washington, D.C. and the Canadian Wildlife Service, Ottawa, Ontario. 120 pages.

(3) "A Critical Evaluation of the Proposed Reduction in the Mid-Continent Lesser Snow Geese Population to Conserve Sub-Arctic Salt Marshes of Hudson Bay." V.G.Thomas and B.K. MacKay. The Humane Society of the United States, Washington, D.C. 1998. 32 pages.

(4) "Monitoring shorebird populations in the Arctic." C.Trevor-Gratto. 1994. Bird Trends 3: 10-12.

(5) "Are there declines in bird species using La Perouse Bay?" R.F. Rockwell, D.Pollak, K.F. Abraham, P.M. Kotanen, and R.L. Jeffries. 1997. The Hudson Bay Project Status Report for Ducks Unlimited. Unpublished report.

Attachment 1
Thomas Testimony

Response to:

Migratory Bird Hunting: Regulations to Increase Harvest of Mid-Continent Light Geese.

Proposed Rule.

Federal Register, November 9, 1998. Volume 63, Number 216, pp. 60271-60278.

By:

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January 4, 1999.

Overview of Proposed Rule.

Central to the proposed rule is the belief that the increase in the population size of Lesser Snow Geese and Ross' Geese (referred to as Light Geese,-LG) is due , largely to the consequences of modern cash-crop agriculture, and, therefore, a human management approach and an increased harvest of geese is the only acceptable option. The roles of natural density-dependent processes that regulate the population size of LG have been discounted by the U.S. Fish and Wildlife Service (USFWS) and dismissed as an unacceptable management option.

The problem identified in the proposed rule is the extensive and heavy grazing of LG upon the coastal salt-marsh plant community of the James and Hudson Bay Lowlands. This has been interpretted to represent a permanent threat to the integrity of the local ecosystem. The extensive grazing is viewed by the USFWS as creating a process of desertification, creating a series of irreversible changes, and putting the entire sub-arctic ecosystem in danger of total collapse. The alternate explanation, that LG are merely inducing an ecological change in the plant community structure and composition that, in the shorter term, will not support a large LG population, has not been considered. Such a change in the plant community composition would quite naturally lead to a reduction in the density of LG populations.

The plant community of the sub-arctic lowlands is subject to a process of continuous change from the combined effects of geological isostatic rebound and the grazing effects of an array of herbivores. This has been commented on in detail in the report of Thomas and MacKay (1998) in their response to the report of the Arctic Goose Habitat Working Group (Batt 1997). The basic premise of Thomas and MacKay (1998) is that if one could not agree upon the definition of the problem, it is not possible to concur with the USFWS' proposed definition of a solution (i.e. greatly reducing the size of the LG population by increasing the harvest across years).

The proposed rule invokes an array of feared scenarios to support the proposal to reduce LG numbers, such as fears of the spread of contagious diseases from LG to more desirable and less numerous species (such as Whooping Cranes), and the fear that competitive exclusion by LG will displace other salt-marsh nesting species and lead to their local demise. The present response examines these scenarios in more detail than was presented in Thomas and MacKay (1998), and concludes that there is no strong

scientific evidence to support either scenario.

By increasing the harvest of LG, the proposed rule purports to be practising ecosystem management on behalf of all species occupying the salt-marsh biome. In so doing, the USFWS believes that the LG are the keystone species that regulate and dominate the local community processes, yet no evidence of such a role is presented. Rather, the USFWS in the proposed rule is perpetuating the outdated single-species approach to management in the belief that fewer LG will benefit all the local salt-marsh species and promote biodiversity. There is no evidence that the proposed action will induce the desired effect. Moreover, the USFWS in the proposed rule has yet to identify how such a proposal will be monitored and how any desired effects will be identified and quantified. This is an egregious emission.
This response is not a tirade against hunting, especially the hunting of geese. The author is both a shooter and hunter. Neither this response nor the report of Thomas and MacKay (1998) objects to the hunting of LG or other species. Rather, both reports criticize the liberalized hunting of LG as the preferred management response to an ecological situation whose definition as "perilous" or "a disaster in waiting" is contentious at best.

Is There an Ecological Problem in Sub-arctic Salt-Marshes?

This question has been addressed by Thomas and MacKay (1998) and the answer is negative. The situation described in Batt (1997) does not constitute a problem for Nature, nor has it ever. The problem is unique to a subset of North American waterfowl managers who would prefer to maintain a population of LG at some arbitrary level and obviate the population fluctuations that attend the long-term history of most arctic-breeding species.

It is acknowledged that several million geese consume a great deal of plant material during the summer. The feeding niche of LG is to uproot rhizomes and runners of plants and create the local eradication of plants. Should this become extensive, the tundra soil conditions change and lead to a different, salt-tolerant, community of plants becoming established and dominating the salt marsh. This change is not to be seen as permanent, and in time, it too will undergo a species shift in composition. The grazing "lawns" that are favored by LG are artefacts of LG grazing and are accepted as such by managers. The changes to salt-tolerant plant communities that attend heavy grazing by LG are also artefacts of LG activity. What is a natural community change produced directly by LG has become regarded by the USFWS as "damage", "degradation", "desertification", and "habitat destruction". It is important to note here that the USFWS has imparted a human value scheme (i.e. undesirable damage) to this grazing process, rather than the value-less ecological interpretation that I prefer.

The bias in the use of values is reflected in the sensational terminology that appears in the

proposed rule. "Desertification, ecosystem collapse, and destruction" are terms applied more appropriately to human actions in environments, rather than to wild, native populations in their natural habitats. On a global scale, wild fires, volcanoes, avalanches, earthquakes, and hurricanes cause the localized and widespread loss of both plant and animal life. Their actions are not viewed as the imperilment of ecosystems, but as the initiators of change. The magnitude of their actions can also be seen easily from outer space and visualized dramatically in satellite photographs. Visualizing the impacts of goose grazing in satellite photographs denotes nothing more than that there are many geese in that system and that they are effective agents of local change.

The use of exclosures in the salt marshes of Hudson Bay present a dramatic picture of how the plant community would appear if LG were never present. Understandably, it contrasts greatly with the heavily-grazed vegetation of the adjacent plots frequented by LG. However, the use of such contrasting pictures is deceptive in that LG are natural members of that community, and are not meant to be excluded.

The process of isostatic uplift, occurring at the rate of over 1m vertical rise per century, results in a tremendous increase (about 15-20m depth) of new shoreline each year. It does not take long for this newly-exposed mud flat to become colonized by vegetation and to become habitat for different migratory species, including LG. The report of Batt (1997) and the proposed rule does not acknowledge this process and its relevance to the lowland community. Rather, the proposed rule emphasises only habitat degradation and loss, and has not tempered this position with a discussion of the implications of habitat gains. This is an egregious oversight.

Large populations of herbivorous animals experience regulation of their numbers by "bottom-up" and "top-down" processes, the former involving food resource limitations, and the latter involving predation and competition. There is already evidence of bottom-up population regulation occurring in LG in Hudson Bay (Cooch et al. 1991) as a consequence of reduced food availability. One could expect this process to both intensify and extensify as a growing population of LG continue to impact their environment. This is the natural process of density-dependence which does not operate on a random geographic basis, but where the available plant growth cannot support the local consumers. The consequences of this process is to allow fewer birds to breed, to survive, or to develop at some optimal rate, i.e. to reduce the rate of population growth. Many goose managers have viewed emaciated, starving, or dead goslings as a sign of an "unhealthy" population and, by extension, as a failure, or lack of, management. The proposed rule regards the shooting of geese in the USA and southern Canada as a better tool than natural, selective, mortality among susceptible LG on their summer range. I have great reservations about the ability of hunters to duplicate the natural selective process, especially when shooting occurs at a different locality and at a different time of year.

The impacts of LG upon salt-marshes are reported to be greater in the southern rather than the northern part of the lowlands, so one would expect the proposed rule to place extra hunting pressure on LG from these southern colonies. It is practicality impossible to segregate the hunting pressure in this way, unless hunters were to shoot blue-phase geese preferentially. One could suppose that in the proposed rule the USFWS is adopting the precautionary principle by placing heavy hunting pressure on LG from all localities, irrespective of the local salt-marsh habitat conditions. That, however, denotes a lack of precision in the management plans.

Is the Present LG Population Impacting Adversely on other Avian Species?

Rockwell et al. (1997), in a report for Ducks Unlimited, conducted a series of surveys at La Perouse Bay colony in southern Hudson Bay to determine if heavy grazing by LG were causing declines in the numbers of other bird species that use similar habitats. The authors reported declines in the population sizes of nine species of shorebirds and waterfowl from that region. The authors also stated that;
"*We have found no compelling evidence that these impacted species are declining on larger spatial scales*". (Rockwell et al. 1997).
The same report also indicates that the local population size of a larger number of bird species (including passerines and waterfowl) at the La Perouse Bay colony had not undergone a decline. Rockwell et al. (1997) emphasized clearly the limitations of their data base and the problems of extrapolating the implications of their results to a wider geographic scale. These authors admit to their results requiring the support of further systematic studies of bird populations in the coastal and adjacent habitats.

Gratto-Trevor (1994) reported a reduction in the numbers of semipalmated sandpipers (*Calidris pusilla)* and red-necked phalaropes (*Phalaropus lobatus*) from the same general region. It is interesting that significant declines in the same species were not reported by Rockwell et al. (1997) in their surveys.

The USFWS in the proposed rule states that;
"*Rockwell et al. (1997) observed a decline of more than 30 avian populations in the La Perouse Bay area due to severe habitat degradation. These declines and other ecological changes represent a decline in biological diversity and indicate the beginning of collapse of the current Hudson Bay Lowlands salt-marsh ecosystem. Much of the degraded habitat is unlikely to recover.*"
It is clear that the caution urged by Rockwell et al. (1997) in the interpretation of their findings has been overlooked by the USFWS in compiling the proposed rule. The USFWS has exaggerated the extent of decline among bird species. The USFWS has also taken as granted that the immediate cause of any decline is the altered state of the salt-marsh caused by goose grazing. Worse still is the assertion by the USFWS that this already marks the start of an irreversible ecosystem collapse. This, surely, is a case of an

agency extrapolating far beyond the limits of the available evidence and arriving at a very sensational conclusion, all to garner indirect support for a great reduction in LG numbers.

LG Population Size and Risks of Contagious Disease Transmission.

The proposed rule fears that the growing LG population and those geese responding to local food shortages by density-dependent processes will exhibit an increased incidence of disease, especially contagious fowl cholera. Disease is a real mortality factor associated with density-dependent population reduction and it has always attended waterfowl populations. The USFWS expresses concerns that contagious disease in LG flocks could be passed to a variety of other waterfowl and cranes that share the same summer and migratory habitat.

Outbreaks of contagious diseases such as fowl cholera have already been occurring in the LG population, but a marked contagion and major losses of other species have not been reported. Given the size of the LG population during the past decade and the gregarious nature of these geese during the fall, winter, and spring, fears of a pandemic involving other species have had adequate time to be realized. Because they have not occurred on a widespread scale, one can only conclude that the disease scenario has been exaggerated to bolster the argument that a major population reduction of LG is warranted.

If the numbers of LG in some Lowland colonies were too high for the locally-available food supplies, disease outbreaks and death would be fortuitous events. Then it would affect mainly the susceptible flocks and lower population density where food resources were least. Surely, that is a positive phenomenon that complements human management of LG.

The USFWS in the proposed rule views disease as a sign of an "unhealthy" population and a phenomenon that is to be avoided (or eliminated) by interventive management. Diseased birds are not available to be hunted, and managers believe that it is preferable for an individual goose to be shot than for it to succumb to disease. While this approach certainly reduces the incidence of disease and risk of contagion, it raises the question of whether wildlife managers should be in the business of sanitizing wild life and shielding birds from their historical pathogens. If managers actively pursue this role, they are deliberately assuming the roles of the veterinary and medical professions.

Nature, across millenia, has resolved the issue of disease and contagion through the processes of exposure, acquired immunity, and the mortality of susceptible individuals. I contend that a truly "healthy" LG population is one that thrives in the presence of pathogens to which it has developed resistance, rather than one which has been artificially secluded from natural disease agents. The latter example would place wild geese in the

same category as closetted battery hens.

Notions of Abundance and Over-abundance of LG.

Thomas and MacKay (1998) criticized the statement that mid-continental LG populations were at record high levels and suggested that such geese were also abundant during the late 1800s. These authors suggest that the food subsidy to geese provided by modern cash-crop agriculture may have simply compensated for the enormous loss of natural habitat to agriculture that has occurred during the past century. This is always going to remain an area of speculation.

A recent period of warmer climate change may also have contributed to a greater recruitment and survival of Hudson Bay LG, and provided an interaction among the effects of summer habitat conditions and winter-spring habitat conditions on LG. The sub-arctic has experienced a warmer climate within the past millenium and it is possible that this may have caused increases in the size of the mid-continental population. The period of the Little Ice Age that followed may have produced a marked reduction in the total population size (see Hanson et al., 1972 , for further comment on this point). It is reasonable to conclude that the sub-arctic lowlands have witnessed periods of both high and low LG densities, and that the native plant communities used by geese have persisted across time. Perhaps it is highly unrealistic and artificial to expect to maintain a LG population at about 1.5 million birds and to hold the habitat in a "snap-shot photo" state when reality tells us that the Hudson Bay lowland is an extremely dynamic region. This dynamism is driven by the prevailing isostatic rebound of the coastal zone interacting with longer-term changes in the prevailing climate. The size of the mid-continental LG population may simply track the opportunities and constraints of the salt-marsh zones across centuries of change.

Bias in the USFWS Attitude of Different Waterfowl Species.

The proposed rule contends that the cash-crop subsidy of LG during the fall-spring period has driven the recent population increase and has confounded management of this LG population. The same agricultural waste grains and produce are also consumed by a wide range of ducks and other species, especially Mallards, Pintails, and Sandhill Cranes. Yet this has not evoked the same level of concern, probably because the population levels of these waterfowl species are still below the long-term population goals established by the North American Waterfowl Management Plan. One can only wonder when the issue of a super-abundant Mallard population being subsidized by an intensive cash-crop agriculture will arise, and what management plans will be launched to rectify it.

The proposed rule expresses concern about the possible inter-specific competition that

may arise on the wintering grounds among LG and other waterfowl. In this regard the USFWS may be overly-concerned about one species (Lesser Snow Geese) and their relationships with other waterfowl. If the numbers of LG are reduced through implementation of the proposed rule, and other waterfowl species numbers increase through "successful and wise management", then the propensity for inter-specific competition remains. Is it that certain types of competition are preferable to the managers of the USFWS? Is it somehow better to have a waterfowl community made up predominantly of favoured, revered, species (such as Mallards and Pintails), even though the effects of competition remain much the same as when LG are present? These questions reflect the species bias that is inherent in much waterfowl management, a bias that can be traced back to the values and goals of single species management.

The proposed rule has portrayed LG as a species verging on pest status, a species that has to be regulated for the good of itself and all the other species that share its habitat. The proposed rule does not convey the impression that LG are just an abundant native species that has adjusted well to the culturally-modified environments, but are still subject to natural regulatory forces. Removing the current restrictions on the hunting practices for LG and greatly increasing the daily bag limits may send an undesirable message to the public. That message reinforces the perception of LG as a nuisance or pest species and leads to the frequent use of pejorative terms for LG (such as "tundra maggots") among goose managers. High bag limits are not conducive to the total consumption of the carcass by hunters, even though they afford a great shooting opportunity for hunters. High bag limits encourage the wastage of shot birds, and may do a lot to encourage higher crippling rates of geese. These possible consequences are not in the spirit of the Migratory Bird Treaty and the idea of hunting as the responsible use of an esteemed species of wildlife.

If LG are identified to be killed, from an ecological perspective it is preferable that they die from natural causes along their annual route, and especially in the salt-marshes of the sub-arctic lowlands. Then there is a recycling of their nutrients among the species of the community, where such nutrients are often limiting, and may contribute to subsequent plant and animal production. Harvesting large numbers, mainly in the southern part of their range does little to enrich the northern salt-marsh communities. Instead, it enriches the land-fill sites and sewage systems of southern towns,-places that already are under much eutrophic pressure.

The Option of Letting Nature Prevail.

The prosed rule has considered this option but has rejected it for what it considers to be valid socio-economic and ecological reasons. The proposed rule indicates that if density-dependent processes were allowed to act on the LG population, the population might decline precipitously and leave a population that could be too small to allow the

traditional type of goose hunting. Moreover, the purported long time for population recovery would be to the detriment of the hunting/outfitting industries during this period.

There is no evidence to suggest that the operation of density-dependent processes would lead to a collapse of the LG population. We already believe that density-dependent regulation is occurring in the southern Hudson Bay colonies (Cooch et al. 1991), but there is no evidence of local, precipitous population collapse. Again, a sensational approach has been used to support the proposed rule.

The USFWS would prefer to have a closely -controlled, well regulated LG population quite apart from reasons of habitat degradation in the sub-arctic. A well- regulated population facilitates the process of establishing harvest regulations and removes some of the "boom and bust" problems from the hunting and outfitting industry. Such a well-regulated population facilitates the work of government regulatory and enforcement agencies and contributes to the impression of successful wildlife management. However, we are running the risk of "barnyarding" wildlife species (i.e. treating them more as ranched wildlife commodities) in the process. Allowing nature to prevail will result in both short and long-term population fluctuations and will confound the convenience of the hunters, the outfitters, and the managers. In return, the resultant populations of LG may be more adapted to the prevailing local conditions and such populations may be assured to flourish over the long term. Such an inconvenience may be a small price for managers and consumptive and non-consumptive users of LG to pay in return.

Concluding Remarks.

This author has no objection to the hunting of LG on a well regulated basis throughout North America, and he endorses the existance of management to procure that end. In the present situation, the heavy grazing of certain plant species in the sub-arctic salt-marshes, and the consequent change in the community structure is not interpretted as an ecological problem, and certainly not as ecological disaster warranting the immediate removal of over half the current population. There is a major problem with the USFWS' interpretation of habitat change, an interpretation that envisages human intervention as the only appropriate management option.

The belief that the removal of many LG will reduce the risk of contagious disease spread to other species is not based upon solid evidence, and if it were a substantial risk, it would have most likely already occurred. Similarly the fear that salt-marsh species of birds in the sub-arctic will be displaced permanently by high populations of LG has yet to be shown in a conclusive manner.

The proposed rule is written from the perspective of an outdated, single species, approach to wild life and its management to benefit certain desired species. A more ecologically relevant approach aimed at the ecosystem level would allow natural population regulatory

mechanisms to act on LG wherever they were exceeding their resource base, and to adjust the population size accordingly. This might take longer than managers might deem appropriate and would still lead to population fluctuations in the future, but it would leave the descendants both vital and adaptable. That would satisfy the needs of geese and all those in society who would use them as the basis of their recreation, subsistence, research, or profession.

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STATEMENT OF DR. ROBERT ALISON, ORILLIA, ONTARIO, CANADA

Lesser snow geese and Ross' geese, collectively "white" geese, are a shared international resource. They nest primarily in the Canadian Arctic and winter mainly in the southern United States. Their numbers seem to have increased substantially in the past two decades, compared to mid-century levels, although it is not known if current populations surpass historic numbers. Anecdotal reports suggest there might have been more geese at the turn-of-the-century than now.

All white geese next in traditional colonies, most with long histories of uninterrupted use, and these colonies occupy a minuscule fraction of the tundra as a whole. A few new colonies have sprouted recently, but the vast majority of breeding occurs at old established sites in the Far North.

Much attention has been focused recently on the lesser snow goose, and in particular the mid-continent population, which breeds in the Eastern Arctic and the Hudson's Bay basin, and winters mainly within the Mississippi Flyway, chiefly in Texas and Louisiana. Surveys suggest that population has at least quadrupled since the early 1970's, and some biologists have proposed that that population growth has generated foraging pressure that is damaging the Arctic ecosystems vital to geese.

Consequently, dramatic goose population reduction has been proposed to protect the tundra.

However, the actual scenario is much more complex than a simple goose vs. habitat interpretation.

The United States and Canada have focused largely on the mid-continent lesser snow goose, and so shall I. These birds nest mainly at about 15 separate colony sites.

Beginning approximately 20 years ago, Arctic habitat changes began to occur in a broad area comprising some 200,000 square miles. The region was mainly wetland, formerly green and lush, and currently brown and dry and seemingly practically lifeless. The main area of deterioration lies between the Ontario-Manitoba border and the McConnell River in the new territory of Nunivut, and largely parallels the Hudson's Bay coast. White geese have been blamed for causing this deterioration, a claim based mainly on ongoing research at the La Perouse Bay snow goose colony on Cape Churchill.

A continental goose-culling initiative has recently taken shape in response to the contention that the habitat deterioration at the La Perouse Bay snow goose colony is a general situation, and that snow geese are threatening vital breeding habitat. I urge caution in jumping to such a conclusion, and for the following reasons, I recommend that the United States Government not be too hasty to cut goose numbers, at least not in the guise of protecting vital Arctic habitat.

First, only a tiny fraction of the whole lesser snow goose mid-continent population actually nests within the area that has deteriorated, amounting to one single colony, at La Perouse Bay, which comprises less than 2 percent of the entire mid-continent breeding population. Two-thirds of the population nests at Southampton and Baffin Islands, more than 400 miles away from the contentious area. Less than one-third nests near the northern edge of the deteriorating area, but most of these geese are abandoning and relocating elsewhere.

There is convincing, but inconclusive, evidence that goose foraging at the tiny La Perouse Bay colony has generated local habitat deterioration, but similar habitat deterioration has not been confirmed for any other lesser snow goose colony—not one. To assume such deterioration is taking place elsewhere due to goose foraging is mere extrapolation and presumption, unwarranted by research. There might be a "smoking gun" at La Perouse Bay, involving a trivial proportion of the goose population as a whole. Elsewhere nobody knows for sure if geese are damaging breeding habitat.

In addition, whereas goose numbers are rising and a substantial area of important habitat has deteriorated, no link between these two developments has been scientifically established. In fact, survey biologists say that the habitat deterioration began to occur before lesser snow geese began to increase in numbers, and that at least some of the deterioration has taken place in areas where white geese do not occur.

Apart from the La Perouse Bay colony itself, the main area in which habitat deterioration has been shown is used by white geese only on migration, where they occur at "staging" sites. It is not breeding habitat for geese, and the extent to which these geese actually use that area has not been determined. Survey personnel say that whereas some of the area of deterioration is used by staging geese, much of it does not seem to be used by white geese at all. It is hard to conclude that the geese are damaging habitat in places where they do not go.

Two major developments are simultaneously impacting on the Arctic, and it is possible that one or both are contributing to the observed habitat deterioration. Neither has been widely publicised, yet both merit concern as possible explanations for what is impacting upon northern habitats.

First, isostatic uplift. Much of North America, centered on Hudson's Bay, was covered with glacial ice, up to two miles thick. The weight of the ice depressed the land mass, and its unloading by melting has caused the land to rise. The greatest uplift is taking place around Hudson's Bay, a rise of about one yard per century. A coastal area up to 200 miles inland has risen by about 1,000 feet since the glaciers melted, and to complete isostatic recovery, that area will rise an additional 540 feet.

The uplifting of the land mass has the effect of drying wetlands, and its impact on the area of habitat deterioration relevant to this discussion has not been studied, and has been largely ignored.

Secondly, global warming is melting the permafrost foundation on which Arctic wetlands float. As the permafrost deteriorates, wetlands drain. Several studies have confirmed such losses, not only in the Canadian Arctic, but also in Alaska. Researchers at some institutions, including the Institute of Terrestrial Ecology in the United Kingdom, have predicted dire consequence for some Arctic habitats.

The significance of warming on fragile Arctic vegetation is not yet clear, but research in the Cape Churchill area suggests that drying is transforming some former wetlands into expanses of barren baked clay. I would suggest it would be wise to examine the impact of warming on the area of deterioration to determine its contribution.

Several possible factors, working alone or in combination, could have resulted in the observed habitat deterioration in the Hudson's Bay basin. To blame geese in particular is unwarranted at this point. We simply do not know for sure what has caused these habitat losses.

Furthermore, ecological research indicates that white geese are facing unprecedented habitat challenges, especially due to global warming, and to focus dramatic population reduction strategies on these birds at this time carries some risk. It is premature to claim the geese are imperiling their habitats, and misleading to cut numbers in the guise of protecting habitats—except perhaps in the context of a single relatively insignificant colony.

I have hunted geese. I have even hunted snow geese. I have not a single objection to goose hunting, per se. The current abundance of geese seems to open more recreational opportunities to sportsmen, and added harvesting seems warranted so long as conditions prescribed by the Migratory Birds Convention, including a season framework of September 1 to March 10, be met.

If, however, there is a special problem at a certain colony, I'd suggest special remedial action at that site—but not to target the entire goose population with extraordinary reduction.

Hunting might not, in fact, be the best way to solve local problems. Aircraft harassment or egging are alternatives. In the absence of alternatives to hunting, the whole process seems to have a distinctly pro-hunting agenda, rather than a broader pro-conservation motive.

Naturally, I would prefer to let Nature take her course. There are signs that that process is underway at La Perouse Bay, where gosling survival is almost one-half what it was 25 years ago. It is natural regulation weeding out geese to achieve equilibrium.

Finally, the plan calls for the culling of one-half of the goose population, and that gives rise to concern. It is the genetic impact I worry about, especially if adult breeders are targeted. The old geese are the storehouses of genetic excellence, and the target of wiping out half the gene pool seems risky. One should wonder about the wisdom of removing from a population such a high proportion of those geese whose genetic information could be vital to geese heading into an especially challenging period of climate change.

Caution. I urge caution.

STATEMENT OF TOM ADAMS, SENIOR POLICY ADVISOR, NATIONAL AUDUBON SOCIETY

Mr. Chairman, on behalf of the more than one million members and supporters of the National Audubon Society, and our 520 chapters in communities in the United States, Canada, and South America, thank you for the opportunity to testify on the impact of Snow Geese on Arctic resources.

The National Audubon Society is one of the nation's leading environmental organizations. Our members are concerned about birds, wildlife, and their habitats. Audubon's involvement with the issue of snow goose overpopulation has included:

(1) representation on the Arctic Goose Habitat Working Group; (2) participation in the Hudson Bay Lowland Excursion, coordinated by the Arctic Goose Joint Venture Management Board; and (3) representation in the Stakeholder's Committee on Arctic Nesting Geese.

The National Audubon Society endorses the recommendations of the Arctic Goose Habitat Working Group, an international team mandated to scientifically document this urgent ecological problem. It is essential that we develop immediate steps that directly reduce the mid-continent population of Lesser Snow Geese. Long-term solutions that may involve changes in land-use practices in the southern and central United States also need to be developed.

The mid-continent population of Lesser Snow Geese (breeding west of Hudson Bay, and wintering on the southern Great Plains and western Gulf Coast) has grown by about 300 percent since the 1960s, and is now estimated at well over three million birds. The population is continuing to grow at an annual rate of 5 percent. This unprecedented number of mid-continent Lesser Snow Geese has had an extensive, destructive, and potentially irreversible effect on arctic and sub-arctic staging and breeding habitats.

The Snow Goose population nesting west of Hudson Bay, Canada, has reached incredible densities (sometimes with as many as 3,000 nests packed into one square kilometer of tundra). Plant species are being destroyed at unprecedented levels as a result of grubbing (by the root) and grazing by the burgeoning Snow Goose population in the Arctic. These plants are being replaced over vast areas by unpalatable, salt-tolerant species. To quote Robert F. Rockwell, Kenneth F. Abraham, and Robert L. Jeffries (Winter 1997 issue of the Living Bird Quarterly) "Scientists are concerned that the increasing numbers of geese may soon lead to an ecological catastrophe as these voracious feeders turn the delicate arctic habitat they inhabit into a barren wasteland."

Ironically, the problem of too many Snow Geese is one of our own making. The rapid increase in mid-continent Snow Goose populations is primarily a result of human modifications of habitat on the wintering grounds, along the migratory routes, and in the staging areas. Agricultural land-use and wildlife management practices have provided a nutritional "subsidy," and have led to high winter survival and recruitment rates. Efforts to protect and enhance populations of waterfowl have worked too well for Snow Geese. Each year, an expanded population of Snow Geese has arrived in their arctic habitat in a stronger condition, with increased breeding success.

These burgeoning numbers of mid-continent Lesser Snow Geese have caused widespread and potentially irreversible devastation to two-thirds of the habitat that otherwise would be mostly pristine tundra west of Hudson Bay in Canada. Long term studies show that populations of many bird species that depend on tundra habitat are declining precipitously as a result of the growing Snow Goose population. These include species from the Partners in Flight "WatchList" of birds at risk such as Hudsonian Godwit and Smith's Longspur, other rare species such as Yellow Rail, American Golden Plover, and Stilt Sandpiper.

If we do not act, nature will not "take its course" in the short time needed to halt devastation of the tundra. This is due to the increased ability of Snow Geese to sustain themselves on the wintering grounds in ever-greater numbers. It is also due to the species' demonstrated ability and willingness to extend their Arctic/Subarctic nesting and foraging ranges continually as existing breeding grounds (i.e., smaller size, poor feather development, and increased disease morality), adult survival continues to increase. A potential scenario is that before millions of these geese suffer a population crash, they will have spread across much of their Arctic, devastating huge areas of tundra, and taken several other valuable bird and animal species with them.

We are here to publicly state the unanimous resolution of National Audubon's Board of Directors to protect wildlife habitat and ecosystems in the Arctic and Subarctic currently under threat from damage by burgeoning populations of Lesser Snow Goose. The Board voted in September 1997 to support the science-based recommendations of the Arctic Goose task force to reduce the mid-continent population of the Lesser Snow Goose through expanded hunting and other means. Audubon's concern in this situation is in line with the Society's mission to protect birds, wildlife, and their habitat, using the best tools available.

The Board resolution commits the National Audubon Society to work closely with Federal, state and Canadian agencies, and other non-governmental organizations to define the most effective mix of short-term and long-term solutions to the Snow Goose population problem. By acting now, we hope to reduce the loss of critical habitat and to protect the many bird species and other wildlife that depend on this habitat.

Mr. Chairman, once again I want to thank you for providing me with this opportunity to testify before the Subcommittee today. I would be happy to answer any questions you might have.

STATEMENT OF DR. BRUCE D. J. BATT, CHIEF BIOLOGIST, DUCKS UNLIMITED, INC., AND CHAIR, ARCTIC GOOSE HABITAT WORKING GROUP, ARCTIC GOOSE JOINT VENTURE

Thank you, Mr. Chairman, for the opportunity to share with you the perspectives of Ducks Unlimited, Inc. on the impacts of light goose populations on the Canadian arctic tundra and on the effectiveness of management programs designed to reduce the numbers of these birds. I am Bruce Batt, Chief Biologist of Ducks Unlimited, Inc. in Memphis, TN and I am also Chairman of the Arctic Goose Habitat Working Group, which was established by the Arctic Goose Joint Venture under the North American Waterfowl Management Plan.

This Working Group has been responsible for developing two scientific reports which have formed the basis for decisions bv the U.S. and Canadian governments that the damage being caused by the geese to the Canadian arctic tundra warranted intervention by management agencies to reduce the numbers of geese to levels that can be sustained for the long term. This Working Group consisted of 17 public agency, university and non-government organization scientists and natural resource managers. This was the strongest group of professionals ever drawn together to analyze a goose conservation issue of such scope and consequence. Our work was objective and very critical in coming to our solid consensus conclusions. Subsequent technical review by other peer scientists has not resulted in any substantive disagreement with our conclusions about the cause of the problem or the desirability of reducing the numbers of geese to a more sustainable level. Credible criticism has only emerged on the question of how much increased harvest is necessary to reduce numbers to desirable levels.

Your invitation to be here today asked me to address three questions. The first was to review the impact that the overabundant geese are having on the Canadian Arctic tundra.

In recent years more geese than ever have been returning to Canada's arctic and sub-arctic breeding areas. This increase has been driven by several factors; the most important of which has been the widespread conversion to agriculture of all the areas in which they live outside the summer breeding period. The birds now have an unlimited food supply for most of the year, a fact that has led to increased winter survival of adults and young-of-the year and the birds now return to the breeding grounds in excellent condition every year. Their condition on arrival is directly related to their breeding success because most of the nutrients used for egg laying and incubation are brought with them from their last stops on the prairies of the U.S. and Canada. Thus, year in and year out the birds are able to lay eggs no matter how poor are the food supplies on the breeding colonies.

After arrival, the geese also feed heavily on the breeding areas right up to actual nesting. Their spring feeding behavior is very destructive, as they have to dig out the roots of their food plants because, like your brown lawn in the spring, all the nutritional value is below ground. The geese have fed like this for thousands of generations. The difference today is that so many return each year that the habitats upon which they feed are so overwhelmingly destroyed by the large numbers of birds that they cannot recover during the short summer growing season. Thus, each year as ever-increasing numbers of birds return, the area of destroyed habitat grows dramatically. On the best studied area, an 1,100-mile strip of salt marsh habitat along the Hudson and James Bays, 35 percent had been destroyed by 1995 and another 35 percent was severely damaged. This is clearly *not* a localized problem as a *very few* individuals have claimed. The word, destroyed, is correctly used because the process of devegetation of the salt marsh results in changes in soil chemistry that will prevent the goose food plants from becoming re-established. In some places, salinity levels have reached three times sea strength.

Other observers on the largest breeding colonies further north have seen similar impacts of salt marsh and upland habitats. However, the degree of damage has not been so fully quantified. That work is underway right now through the use of satellite photographs on which the damaged areas are easily seen from space. Because of the availability of archived images, the scientists will be able to look at scenes from the past two decades to measure the rate of destruction of the ecosystem. However, there is no doubt among the scientists on the ground that the damage has been enormous. The finite amount of suitable goose breeding habitat is rapidly being consumed and will eventually be lost.

The destruction of these areas is manifested in increasingly low survival of goslings because there are no food plants that they can eat when they hatch. It is easy to go to colonies along the Hudson Bay Lowlands and find hundreds of dead and dying goslings. I've done it myself at Cape Henrietta Maria and LaPerouse Bay. There are already tens of thousands of goslings dying each year and there will soon be millions. Normally, density dependent population regulation would have occurred before this condition emerged and the adults would have reduced their egg production because of lack of food. The unusual twist on this story is that the geese are freed from local conditions because they return fat and ready to breed because of agriculture in Canada and the U.S.

If we do not intervene, the likely course of continued population growth is increased gosling mortality until so few survive that the population eventually declines because the natural mortality of adults is not being replaced. This could be thought of as a population "crash" although it will be protracted over several years. The population will decline to some very low level and remain there for a very long time because the habitat needed to fuel a population recovery will have been destroyed and will remain that way for many decades—much of the next century.

Extensive collateral damage will also occur because the collapsed ecosystem will no longer be able to support all the other wildlife species that depend on these systems for their sustenance. As unhappy as the forecast is for the geese, this collapse of an ecosystem may actually be an even more serious consequence "in the big picture."

We concluded that managers should intervene to prevent the continued growth of this problem because it is caused by changes that, although unwittingly, we have wrought on the North American continent. To fail to do so would be an abrogation of our most fundamental responsibility to conserve the biodiversity of life in all the ecosystems that we influence. I believe Mr. Rogers has already explained how the U.S. and Canadian governments have responded so far.

The second question was how successful we thought the U.S. Fish & Wildlife Service's actions to reduce the size of the white goose populations in the mid-continent would be. It is only possible to speculate on the answer as the first conservation order is still in effect and we do not yet know how many birds are being removed from the population. There are plenty of restraints on this first effort as it was not authorized until quite late in the winter which was short notice for hunters and outfitters to gear up for a new time frame with new tools for the harvest. The cultural shift of hunters participating in a harvest at this time of year will also take some time to develop and not all jurisdictions are yet able to fully participate. Nevertheless, informal feedback indicates that the harvest is well underway and many geese are being shot. I believe we will learn, after the final kill estimates are in hand, that enough birds were harvested to verify that future seasons, with more of the restraints removed, should indeed be able to get the job done.

The third question was about additional steps that might be taken if the current activities are not successful. This would substantially involve direct culling of the population by management agencies. This is an extremely distasteful prospect for everybody. It has profound political and economic consequences. It is hard to conceive of an army of paid government employees trapping and euthanizing geese, whether it occurred in Texas, South Dakota, Manitoba or the Northwest Territories. Planning for this eventuality has not proceeded very far because a reasonable test of how much can be accomplished using the current methods will take a few years.

Everybody with a sincere concern about the future welfare of this wonderful resource and the ecosystems in which it lives hopes deeply that increased harvest will work because we have even less experience with whatever the next steps might be. Further, it is not at all clear that the necessary political and economic support can come together to actually allow such practices. It is far more prudent to maintain the current course and it is crucial to do so without delay. Every technical, administrative, legal and political delay just adds to the problem. There is real urgency here as we may not be far from the point where the only choice is to record the aftermath of the crash of goose numbers with the related ecosystem destruction with all the other species that live there with the geese.

DON YOUNG, CHAIRMAN

U.S. House of Representatives
Committee on Resources
Washington, DC 20515

April 8, 1999

MEMORANDUM

TO: Members, Subcommittee on Fisheries Conservation, Wildlife and Oceans

FROM: Subcommittee Majority Staff

RE: Migratory Bird Hunting Regulations to Increase Harvest of Mid-Continent Light Geese

At 11:00 a.m. on Thursday, April 15, 1999, in Room 1324 Longworth House Office Building, the Subcommittee on Fisheries Conservation, Wildlife and Oceans will conduct an oversight hearing on the U.S. Fish and Wildlife Service's two "final rules" to save fragile Arctic habitats from irreversible damage caused by an exploding population of Mid-Continent light geese. Those invited to testify include: The Honorable Duncan Hunter; The Honorable Randy "Duke" Cunningham; The Honorable Saxby Chambliss; The Honorable Collin C. Peterson; The Honorable Bruce Babbitt, Secretary, Department of the Interior; Mr. Matthew B. Connolly, Executive Vice President, Ducks Unlimited, Inc.; Mr. R. Max Peterson, Executive Vice President, International Association of Fish and Wildlife Agencies; Dr. Daniel P. Beard, Senior Vice President, National Audubon Society; Mr. Jeffrey Pike on behalf of the Humane Society of the United States; and Mr. Robert Allison of Orillia, Ontario, Canada.

BACKGROUND

In 1916, the United States and Great Britain (for Canada) signed a Convention for the Protection of Migratory Birds. The fundamental goal of this Convention established an international framework for the protection and conservation of migratory birds.

In fact, under the Treaty, unless and except as permitted by regulations, it is unlawful at any time to "pursue, hunt, take, capture, kill, possess, offer for sale, sell, offer to barter, barter, offer to purchase, purchase, deliver for shipment, ship, export, import ... any migratory bird, any part, nest, or egg of any such bird ... included in the terms of the convention between the United States and Great Britain for the protection of migratory birds". The United States has signed similar agreements with Mexico and the former Soviet Union.

What is a migratory bird? Under the Convention, the term "migratory bird" means all wild species of ducks, geese, brants, coots, gallinules, rails, snipes, woodcocks, crows, and mourning and white-winged doves.

In 1918, the U.S. Congress passed the Migratory Bird Treaty Act (50 CFR 21.47). This Act became our domestic law implementing the International Convention, and it committed this Nation to the protection and management of migratory birds. In addition, the Act gave the U.S. Fish and Wildlife Service (FWS) the authority to develop regulations on the harvest or "take" of migratory game birds. Both the Convention and the Migratory Bird Treaty Act were designed to ensure proper utilization of migratory bird resources.

In the 81 years since the Congress passed the Migratory Bird Treaty Act, the FWS has issued numerous Federal regulations on the circumstances under which a hunter may take a migratory bird. For instance, the FWS annually issues regulations establishing the length of hunting seasons and bag limits (number an individual may kill) for each migratory bird species. These regulations are issued only after an extensive biological review has been conducted on population levels, reproduction rates, and habitat availability for these species.

Over the years, the FWS has issued regulations restricting the methods an individual may use to harvest migratory birds. For example, it is illegal to take a migratory bird by:

- the aid of "baiting," which is the placing, exposing, depositing, distributing or scattering of corn, wheat or other grains – to constitute a lure, attraction, or enticement to an area used by hunters;
- the use of a sinkbox or any other type of floating device that places the hunter beneath the surface of the water;
- the use of a motor vehicle or aircraft;
- the use or aid of live birds as decoys; and
- the use of any shot except steel shot, bismuth-tin shot, or other shot approved by the Secretary of the Interior that is nontoxic to waterfowl.

WHAT ARE LIGHT GEESE?

Snow or light geese are commonly known as "white geese" in the United States, where a person is likely to see Greater snow geese, Lesser snow geese, or Ross' geese. A typical light goose is about 29 inches long, has a wing span of 17 inches, and weighs approximately 6 pounds. The Ross' goose is smaller in size but are comparable in appearance.

The majority of light geese nest in the spring in Arctic and sub-Arctic areas of Alaska and Canada, including Quebec, Ontario, Manitoba, and the Canadian Northwest Territories. The Hudson Bay lowlands in Canada – one of the largest wetlands in the world – is the primary nesting site. Evidence indicates that the majority of light geese migrate, stage, or winter in the U.S. portions of the Central and Mississippi Flyways that affect 24 states. These include Alabama, Arkansas, Colorado, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Michigan, Minnesota, Mississippi, Missouri,

Montana, Nebraska, New Mexico, North Dakota, Ohio, Oklahoma, South Dakota, Tennessee, Texas, Wisconsin, and Wyoming.

The primary food supply and diet of a light goose includes grasses and sedge species, as well as the underground parts, roots and tubers of grasses, sedges, and other plants. A typical light goose has a voracious appetite and engages extensively in grubbing of below-ground biomass, especially after the first snow melt, which can leave behind nothing but bare mud when it is overgrazed.

Light geese share their nesting habitat in the Hudson Bay lowlands with hundreds of different species of birds. These include several major populations of Canada geese, half of the Atlantic brant population, and significant numbers of pintails, black ducks, green-winged teals, and mallards. Species such as yellow rails, scaup, shoveler and wigeon are no longer found in areas overpopulated with light geese.

WHAT IS THE PROBLEM?

The FWS has been monitoring light geese populations since 1948. Many species of Arctic breeding geese have increased over the last 30 years. The number of light geese has dramatically increased from 800,000 in 1969 to more than five million birds today. Assuming a 10 percent growth rate in the breeding population over the next three years, the population will grow to approximately 6.8 million in the absence of any new management actions.

According to biologists at the Fish and Wildlife Service, there are primarily four reasons why there has been such a population explosion. The first is the expansion of agricultural areas in the United States and prairie Canada that provide abundant food resources during migration and winter. Presently, there are about 2.25 million acres of rice farms in Arkansas, Louisiana, and Texas. In addition, there are millions of acres of cereal grains crops being grown in the Midwest region of the United States.

Second is the establishment of sanctuaries along the flyways, in particular a number of National Wildlife Refuges are now home for thousands of migrating light geese.

Third, there has been a significant decline in harvest rates. Light geese, which travel in huge flocks, are difficult to successfully hunt. This has not been a significant population control method.

Fourth, because of these factors, especially the abundance of food, mortality rates have decreased and the number of breeding adults returning to nesting areas has dramatically increased. This huge population growth of light geese has reduced thousands of acres of once thickly vegetated salt and freshwater marsh to a virtual desert. The Hudson Bay lowlands salt-marsh ecosystem is comprised of a 12,000-mile strip of coastline along west Hudson and Jones Bays, Canada. This ecosystem contains approximately 135,000 acres of coastal salt-marsh habitat. According to biologists, grazing light geese have destroyed one-third of this delicate habitat for the foreseeable future. Another third is on the brink of devastation, and they are currently eating their way through the remaining third. In fact, there is a genuine fear that we are beginning to see the collapse of this

ecosystem which is critical to many bird species. Scientists have conducted enclosure experiments that indicate it may take at least 15 years for vegetation to begin to regrow and that would require a total absence of goose foraging.

As a further illustration, 60 percent of the salt-marsh vegetation in the La Prouse Bay in Canada is now either destroyed or damaged to the point where it is unable to nourish birds. At some bird colonies, habitat destruction has been so severe that young geese are malnourished and, because of this, have smaller adult body size, reduced growth rates, and lower gosling survival. The population is shifting to older adults and there are fewer young, strong light geese. If there is a population crash brought on by avian diseases, there will be fewer young light geese to begin the rebuilding process.

The destruction of the Canadian Arctic tundra is also having severe negative consequences on more than 30 avian species that nest and reside in this habitat. These include: American wigeons, dowitchers, Hudsonian godwits, Lapland longspurs, Northern shovelers, red-breasted mergansers, oldsquaws, parasitic jaegers, semi-palmated sandpipers, and yellow rails. Since ecological recovery of cold tundra habitat is extremely slow, it is essential that some type of remedial action be undertaken.

HOW TO CONSERVE REMAINING TUNDRA?

During the past few years, the U.S. Fish and Wildlife Service has worked closely with the Canadian Wildlife Service; Ducks Unlimited; the Louisiana, North Dakota, Oregon and Virginia Departments of Fish and Game; the National Audubon Society; and other nongovernmental entities. These organizations were members of the Arctic Goose Habitat Working Group that issued a report in 1997 entitled "Arctic Ecosystems in Peril". In that report, there are a number of suggestions on ways to alleviate the destruction of the Arctic tundra including:

- The U.S. Fish and Wildlife Service should assign full-time staff coordinators to develop and advance effective strategies to reduce Mid-Continent light geese to the desired population levels;
- Develop a comprehensive communication strategy to inform the public of the problems caused by overabundance of certain Arctic and sub-Arctic goose populations;
- Reduce the availability of food – corn, rice and millet – along the major migratory flyways of the light geese;
- Expand hunting opportunities for individuals to shoot light geese in various wildlife refuges in the United States;
- Allow the Native Inuits of Canada to gather and utilize the eggs of light geese;
- Allow year-round hunting of light geese with unlimited daily bag limits (season has traditionally been set at the maximum number of days allowed by the Migratory Bird Treaty Act: September 1 to March 10);

- Permit hunters to use electronic bird calls, live decoys, and "bait" light geese to help increase harvest levels and reduce the population;

- Hire professional sharpshooters to kill light geese and donate the birds to food banks for the poor; and

- Undertake some type of aggressive government sanction program to reduce the number of light geese at their nesting areas in the Hudson Bay lowlands.

U.S. FISH AND WILDLIFE SERVICE FINAL RULES

On February 16, 1999, the U.S. Fish and Wildlife Service issued two final rules that authorize the use of additional hunting methods and established a conservation order to reduce the population of Mid-Continent light geese.

These rules were crafted after reviewing over 1,100 comments from Flyway Councils, Native Corporations, nongovernmental organizations, state wildlife agencies, and private individuals. The comment period was open from November 9, 1998, to January 15, 1999. Both rules became effective on February 16th.

Under the terms of the first rule, an individual may use an unplugged shotgun and an electronic caller to hunt light geese during a normal hunting season when all other waterfowl and crane hunting seasons are closed. These methods are normally prohibited by the Migratory Bird Treaty Act of 1918.

The second rule, which is a conservation order, authorizes certain states to implement actions to harvest Mid-Continent light geese by shooting in a hunting manner, inside or outside of the regular open migratory bird hunting season framework. Once again, this activity can only occur when other waterfowl seasons are closed and it is limited to the 24 affected states.

The goal of these two measures is to give affected states a better opportunity to increase their light goose harvest. The Service believes that removing adults is the most effective and efficient approach in reducing the population. The hope is that 975,000 Mid-Continent light geese will be harvested in the first year because of these management changes.

In their press release, the Director of the U.S. Fish and Wildlife Service, Ms. Jamie Rappaport Clark, stated that "We need to act immediately to stop and reverse the insidious habitat destruction currently taking place in the Arctic but by doing so, we are not ruling out any other solutions that could help solve this problem and ensure healthy population levels for the future."

In the Administration's Fiscal Year 2000 budget submission, the U.S. Fish and Wildlife Service has asked for $200,000 to assist National Wildlife Refuges in evaluating the effectiveness of Lesser snow goose population control measures. At this point, the Service has not authorized any additional light geese hunting opportunities at our Nation's 516 National Wildlife Refuge units.

The purpose of the oversight hearing is to carefully review the impact that light geese are having on the Arctic tundra habitat, examine the likely effectiveness of the Service's two final rules on Mid-Continent light geese, and inquire whether additional population control measures, such as culling, egging, or trapping, are more likely to ensure that this essential habitat is not permanently damaged in the future.

ISSUES

1. On February 16, 1999, Director Clark stated that "For years, the United States has inadvertently contributed to the growth of this problem through changes in agricultural and wetland management. Now we can begin to say we are part of the solution. If we do not take that action, we risk not only the health of the Arctic breeding grounds but also the future of many of America's migratory bird populations." Is that a fair assessment?

2. Will it be necessary to amend the Migratory Bird Treaty Act of 1918 or to approve a freestanding statute to implement the various options?

3. What is wrong with the "Let nature take its course" option? Why not simply allow the population to crash? What is wrong with this strategy?

4. What is the impact of the destruction of the Arctic tundra on the other bird species that nest and live in this region?

5. What are the long-term consequences of the destruction of the tundra?

6. Has there ever been a situation like this before in the Hudson Bay lowlands or is this an unprecedented event in terms of the magnitude of the problem caused by an overabundance of a migratory bird species?

7. How much of the light geese population must be reduced to ensure the future viability of the Hudson Bay lowlands? How was this figure scientifically established?

8. If Congress appropriates the $200,000 requested for Lesser snow geese, how will these funds be spent?

9. What was the rationale for the lawsuit filed on this issue and what is the current status of this legal challenge?

Canadian Embassy Ambassade du Canada

501 Pennsylvania Avenue, N.W.
Washington, D.C. 20001

April 14, 1999

The Honourable Jim Saxton, Chairman
Subcommittee on Fisheries Conservation,
Wildlife and Oceans
House Committee on Resources
U.S. House of Representatives
805 O'Neil House Office Building
Washington, D.C. 20515

Dear Chairman Saxton,

Thank you for the invitation, via subcommittee staff, to identify a Canadian wildlife expert to testify at the April 15 Subcommittee on Fisheries Conservation, Wildlife and Oceans hearing on the over-abundance of snow geese. Canadian Government policy continues to preclude its officials from testifying before foreign government bodies. We therefore welcome the opportunity to provide a written statement, for the record, of Canadian views and actions being taken to manage this serious problem, as described in the attached document prepared by the Canadian Wildlife Service. This updates the written material I provided to you for a similar hearing this time last year.

As always, please call me if I can provide any further information, particularly on Canadian policies and programmes.

Yours sincerely,

Raymond Chrétien

Raymond Chrétien
Ambassador

The Snow Goose

A paper Prepared for the Subcommittee on Fisheries,
Wildlife, and Oceans
U.S. House of Representatives

by

The Canadian Wildlife Service
Environmental Conservation
Environment Canada

Introduction

The Canadian Wildlife Service has been working closely on the problem of overabundant Snow Goose populations with the United States Fish and Wildlife Service. A paper on this subject was prepared by the Canadian Wildlife Service and presented to this Subcommittee by the Canadian Ambassador, Raymond Chrétien, on April 22, 1998. The purpose of the present paper is to confirm the Canadian Wildlife Service commitment to address the ecological issue of uncontrolled increase in some Snow Goose populations, and to update statements made previously in the light of changes over the past 12 months.

Background

The 1998 paper described the unusual level of agreement among field ecologists who have been working with Snow Geese during the last decade that the rapidly expanding populations are having environmental impacts over large areas of northern intertidal salt marsh. There is a broad consensus that the present growth rates of the geese can not be sustained, and that the particular kinds of habitat preferred by the geese are threatened in many areas.

Although the scientific understanding has not changed much since 1998, some new analysis has been carried out, and some new data are available. Most important is a new report on the Greater Snow Goose. This subspecies nests to the north of Baffin Island, and migrates through the province of Quebec. It winters on the Atlantic seaboard of northeastern United States. The Greater Snow Goose population is expanding at about 9 or 10% per year, and the report suggests that steps should be taken now to slow the growth, in the hope that the spring population will level off to about 1,000,000 birds. For this reason the Canadian government has put in place regulations to allow a take of Greater Snow Geese in the spring, as described below.

The scientific world is not without controversy. Some well-established researchers, in their review of the scientific report that assesses the Mid-

continent Lesser Snow Goose Population (the report titled Ecosystem in Peril), have concluded that the mathematical models used therein underestimate the growth potential of the geese. They argue that the geese will multiply more rapidly than predicted to the extent that hunting will not be able to stop the growth. Some of these researchers feel that it may be futile to use special hunting measures. The Canadian Wildlife Service response to this argument is based on an adaptive management approach. That is, we intend to establish special measures to increase the take of geese by hunters, and then monitor the take, monitor the goose populations, and reassess our strategy on an annual basis. Our expectation is that the managed take by hunters, together with other factors, will indeed allow successful control of the population growth. Meantime, we will continually test this assumption.

During 1998 the Canadian Wildlife Service added to the database of Snow Goose populations. Despite the high cost of Arctic surveys, we have been increasing the effort going into counting the geese. These data have confirmed the continued growth of numbers (see attached Table 1.)

Canadian Regulations

On March 26, 1999 the Canadian government announced regulations aimed at reducing the growth of Snow Goose populations (see attached Regulation and Regulatory Impact Statement). As the Canadian hunter takes more Greater Snow Geese than his U.S. counterpart, we have assigned first priority to this subspecies in the Canadian regulations. The special measures for a spring take of Greater Snow Geese begin on April 15 in Quebec. Each hunter taking part must register with the Canadian Wildlife Service. As of April 13, 9,000 hunters had registered, and it is expected that over 10,000 hunters will take part. With this much participation we stand a good chance of achieving the objective of bringing the Greater Snow Goose population growth under control by 2002. These measures have been strongly accepted in Quebec. Support has been registered by scientists, landowners and hunters. Wildlife matters in northern Quebec are considered by an aboriginal-government coordinating committee that has taken the formal step of passing a resolution supporting these regulations.

The Mid-continent Snow Geese are the birds that are the subject of special measures in the United States in 1999. In contrast to the Greater Snow Geese, these birds are normally taken in the United States at a much higher rate than in Canada. Also in contrast, the scientists' recommendation for Mid-continent Snow Geese is that the population should be reduced immediately, rather than just have its growth slowed as is being undertaken in Quebec. Our consultations on times and places for special measures dealing with Mid-continent Snow Geese in the prairie provinces are in early stages, and for 1999 only the most northern zone of Manitoba is included. Special seasons have been established

there in May and in August. Only a small number of Snow Geese and almost no Ross Geese are expected to be taken in that zone. As the need to deal with the overabundance of this population is not in question, the relatively low impact of Canadian regulations in 1999 make the special measures taken in the United States all the more important.

It is important to remember that not all species of geese, and not all populations of Snow Geese are overabundant. We continue to exercise caution, controlling the take of Wrangel Island Snow Geese, Atlantic Canada Geese and Southern James Bay Canada Geese, for example. We will continue to be careful that our efforts to increase the harvest of some groups of snow geese do not jeopardize such stocks.

In 1998 when regulatory strategies were under development both the Canadian Wildlife Service and the United States Wildlife Service were planning to base their regulatory action on the modified wording of amendments to the Migratory Birds Convention that were negotiated in 1995. Those amendments have not yet been ratified and so in each country we have had to use the 1916 Convention wording for these special measures. We have each come to the conclusion that Article VII of the Convention allows for the take of Snow Geese outside the regular hunting season under the extraordinary conditions that have been shown to exist. Nonetheless, we continue to place the highest priority on ratification of the 1995 amendments, as many aspects of our shared management of birds, and in particular the necessary recognition of aboriginal treaty rights in Canada, hinge on having the amendments implemented.

Issues and Options

Can the ecological problem be solved in the northern breeding grounds of the geese?

The Canadian Wildlife Service has been working with aboriginal groups to encourage them to take more geese in and around the breeding areas. It is known, however, that this can only be part of the overall solution. To date, no feasible method for reducing populations numbers in northern areas has been proposed. Some of the more extreme ideas, such as the use of chemicals delivered onto breeding colonies by aircraft, are clearly unacceptable from considerations of humaneness, damage to non-target species, and effectiveness. The areas where the geese migrate and nest are huge and very remote from centres that can provide fuel and logistic support. Methods that would involve personnel on the ground are both risky and expensive. Weather conditions are often life-threatening to people who are not familiar to the area. Polar bears are relatively common in these places, and human-bear proximity is dangerous for both species. The geese are widely dispersed and difficult to find or capture. Modeling has shown that population control based on the taking of

eggs and young geese is relatively ineffective, so breeding ground programs would probably have to target adult geese. We have developed techniques for the efficient capture of adult geese that would be applicable for a cost of about $50 per bird in the more accessible colonies, but that allows nothing for the much larger costs of processing and transportation if the meat were to be used rather than wasted.

Could the Mid-continent Snow Goose problem be dealt with only at the specific breeding colonies where damage to habitat has occurred?

Habitat damage is not limited to the breeding colonies, and the cause of the damage is not only the geese breeding nearby. During spring migration millions of Snow Goose on migration to colonies in the eastern Canadian Arctic stop and feed in habitat patches in the intertidal areas on the west of James and Hudson Bays. It is estimated that 1/3 of the goose-adapted intertidal salt marsh habitat along that entire coast has been devegetated. So control that deals only with the breeding colonies will not achieve the necessary objectives.

It is true that habitat damage is most evident near the breeding colonies where the plants face double jeopardy - first in early spring from large flocks of migrating geese, and later from the more widespread feeding of goose families raising young. Thus it is near the colonies that the habitat damage has gone beyond the goose-adapted vegetation communities into areas that are little able to cope with feeding by the geese, such as willow-dominated habitats.

It is clear that the habitat deterioration is not limited to a single colony. Habitat deterioration caused by geese has been confirmed not only at the La Pérouse Bay colony in Manitoba , but also at the McConnell River - Arviat colony in Nunavut, at the Cape Henrietta Maria colony in Ontario, at Akimiski Island, and at the Queen Maud Gulf. Nor is the deterioration limited to the colonies themselves, but staging areas along Hudson Bay are also affected.

Could not the habitat degradation be the results of other factors such a isostatic uplift and global climate change?

In the shallow, post-glacial, tidal regions around Hudson Bay isostatic uplift has been an important factor for thousands of years. The rate at which this geological process modifies habitat is well understood. The rate of habitat change caused by the geese is occurring much more rapidly. Climate change, too, may be having effects although this is more controversial. But within the time scale of interest it is the geese that are effecting change - as has been clearly demonstrated by experiments in which geese are excluded and other factors remain unmodified.

Breeding Adult[1] Lesser Snow Geese and Ross' Geese as Estimated by Air Photo Inventory 1966 to 1998 (R. Kerbes, CWS, unless otherwise noted)

	LESSER SNOW GEESE										ROSS' GEESE		
	Wrangel Island[2]	Western Arctic[3]	Central Arctic	Eastern Arctic						Mid-Continent Total[4]	Central Arctic	Eastern Arctic	Total[4]
				Baffin Island	Southampton Island	West Hudson Bay	Hudson Bay	Cape Henrietta Maria	Subtotal				
Year													
1966			10,300[5]								34,000[5]		34,000
1973	12,000			446,600	155,800	390,200	5,600	59,200	1,057,400				
1976	46,000	169,600	56,400							1,113,800	77,300		77,300
1977	10,000					353,200							
1978	42,000					331,800							
1979	60,000			454,800[6]	233,000[6]			109,200[7]					
1980	20,000					309,200	17,000		1,123,200				
1981	78,000	207,500											
1982	28,000		105,700							1,228,900	90,800		90,800
1985	50,000					436,400	28,100						
1987	47,000	205,100											
1988	13,000		279,000								188,000		
1990	53,000					201,900	46,400					2,000	190,000
1995	8,800	486,100											
1997	45,200			1,706,500	715,000[8]	153,500	66,000	280,200[9]	3,010,200[10]				
1998			1,384,000[11]							4,394,200	982,000[10]	52,000[12]	1,034,000

1Non-breeding adults (primarily 1- and 2-year-olds) estimated to be an additional 30% of the number of breeding geese (Cooke et al. 1999)

2Ground surveys by Russian biologists (1973-1995 taken from Kerbes et al. 1999; 1997 pers. commun. V. Baranyuk to R. Kerbes)

3Includes small Anderson River and Kendall Island colonies (3600 and 3000, respectively in 1995; Kerbes et al. 1999) but not Howe Island, Alaska (800 in 1993; Johnson 1996)

4Totals calculated using estimates from that year plus most recent previous estimates for other areas; mid-continent = central + eastern arctic.

5Visual aerial survey by J.P. Ryder (see Kerbes 1994)

6Air photo inventory (Reed et al., CWS, 1987)

7Air photo inventory (K. Ross, CWS)

8Includes Boas River, East Bay, Ell Bay, Coral Harbour and Bear Cove/Maurice Point

9Prelimary estimate

10Includes 16,500 at West Pen Island, 5,300 at Shell Brook, 2,500 at Akimiski Island and 3,800 at Knife/Seal River (1995-97 estimates)

11Preliminary estimates from air-ground surveys (Alisauskas et al. 1998; note: may be high) - air photo analysis not yet completed

12Estimated from 1997 photo inventory and 1997-98 coastal surveys (50,000 West Hudson Bay, A. Didiuk; 2,000 Baffin Island, D. Caswell)

CANADA

PRIVY COUNCIL • CONSEIL PRIVÉ

P.C. 1999-526
March 25, 1999

His Excellency the Governor General in Council, on the recommendation of the Minister of the Environment, pursuant to section 12 of the *Migratory Birds Convention Act, 1994*, hereby makes the annexed *Regulations Amending the Migratory Birds Regulations*.

REGISTRATION — ENREGISTREMENT
No. SOR/99-147 DATE March 25, 1999
REGISTRAR OF STATUTORY INSTRUMENTS
CANADA
REGISTRAIRE DES TEXTES RÉGLEMENTAIRES

CERTIFIED TO BE A TRUE COPY COPIE CERTIFIÉE CONFORME

CLERK OF THE PRIVY COUNCIL LE GREFFIER DU CONSEIL PRIVÉ

Received Time Mar.31. 12:35PM

JUS-600549
(SOR/DORS)

REGULATIONS AMENDING THE MIGRATORY BIRDS REGULATIONS

AMENDMENTS

1. (1) The definition "Act" in subsection 2(1) of the *Migratory Birds Regulations*[1] is replaced by the following:

"Act" means the *Migratory Birds Convention Act, 1994*; (*Loi*)

(2) Subsection 2(1) of the Regulations is amended by adding the following in alphabetical order:

"bait crop area" means an area of cropland, harvested or unharvested, that is intended to attract migratory birds and that is designated as such an area by poster, notice or sign; (*zone de culture-appât*)

2. Subsection 5(4)[2] of the Regulations is replaced by the following:

(4) Subject to section 23.1, no person shall in any area described in Schedule I hunt a species of migratory bird except during an open season specified in that Schedule for that area and that species.

3. (1) The portion of subsection 14(1)[3] of the Regulations before paragraph (*a*) is replaced by the following:

14. (1) Subject to section 23.3, no person shall hunt for migratory game birds within 400 m of any place where bait has been deposited unless the place has been free of bait for at least

(2) The portion of subsection 14(3)[3] of the Regulations before paragraph (*a*) is replaced by the following:

(3) Subject to section 23.3, no person shall deposit bait in any place in the Province of Quebec during the period beginning 21 days before the first day of the open season for that place and ending on the day immediately following the last day of the open season for that place, or in any place in any other province during the period beginning 14 days before the first day of the open season for that place and ending on the day immediately

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[1] C.R.C., c. 1035
[2] SOR/81-641
[3] SOR/93-431

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following the last day of the open season for that place, unless the person, at least 30 days prior to depositing the bait,

4. (1) The portion of subsection 15(1) of the Regulations before paragraph (*a*) is replaced by the following:

15. (1) Subject to subsections (4) and (5) and sections 23.1 and 23.2, no person shall hunt a migratory game bird

(2) Subsection 15(7)[3] of the Regulations is repealed.

5. The Regulations are amended by adding the following after section 23:

OVERABUNDANT SPECIES

23.1 (1) The holder of a migratory game bird hunting permit may, in accordance with subsections (3) to (5), kill a bird of a species of migratory game bird that, as a result of the rate of increase of the population of that species or its overabundance, is injurious to or threatens agricultural, environmental or other similar interests.

(2) The birds referred to in subsection (1) are birds of a species set out in the heading of column 2 of Table I.2 of Part V or Table I.2 of Part VII of Schedule I, including other species that are not easily distinguishable from the species referred to in subsection (1).

(3) The area in which a bird referred to in subsection (1) may be killed is an area described in Table I.2 of Part V of Schedule I for the Province of Quebec or in Table I.2 of Part VII of that Schedule for the Province of Manitoba.

(4) The period during which a bird referred to in subsection 1 may be killed is a period referred to in Table I.2 of Part V of Schedule I for the Province of Quebec or in Table I.2 of Part VII of that Schedule for the Province of Manitoba, for the area referred to in subsection (3).

(5) A bird referred to in subsection (1) may be killed by using, in addition to the hunting methods and equipment permitted by sections 15 and 15.1, the hunting methods and equipment referred to in Table I.2 of Part V of Schedule I for the Province of Quebec and in Table 1.2 of Part VII of that Schedule for the Province of Manitoba, for the area referred to in subsection (3) and the period referred to in subsection (4).

23.2 For the purposes of section 23.1, the Minister shall, on application, without cost, grant an extension of a permit to the holder of a migratory game bird hunting permit.

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23.3 (1) In the Province of Quebec, in the spring, the holder of a migratory game bird hunting permit may kill a bird of a species referred to in the heading of column 2 of Table I.2 of Part V of Schedule I in accordance with section 23.1 in any place where bait has been deposited if at least 30 days prior to depositing the bait the holder

(*a*) obtains the consent in writing of

(i) every landowner and lessee or tenant of the land on which the bait has been placed, and

(ii) the Regional Director; and

(*b*) posts in that place signs of a type and wording satisfactory to and in a location designated by, the regional director.

(2) In the Province of Quebec, in the fall, the holder of a migratory game bird hunting permit may kill a bird of a species referred to in the heading of column 2 of Table I.2 of Part V of Schedule I in accordance with section 23.1 in a bait crop area if at least 30 days before killing a bird in that area the holder

(*a*) obtains the consent in writing of

(i) every landowner and lessee or tenant of land within 400 meters of the bait crop area, and

(ii) the Regional Director; and

(*b*) posts in that place signs of a type and wording satisfactory to and in a location designated by the Regional Director.

(3) A consent obtained under paragraphs (1)(*a*) and (2)(*a*) is valid only in respect of the period for which it was obtained.

6. Schedule I to the Regulations is amended by replacing the reference "(*Sections 5, 7, 8, 10, 13 and 15.1*)"[4] after the heading "SCHEDULE I" with the reference "(*Sections 5, 7, 8, 10, 13, 15.1, 23.1 and 23.3*)".

7. Part V of Schedule I to the Regulations is amended by adding the following before Table II:

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[4] SOR/90-623

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TABLE I.2

MEASURES IN QUEBEC CONCERNING OVERABUNDANT SPECIES

Item	Column 1 Area	Column 2 Period during which Snow Geese and Ross Geese may be killed	Column 3 Additional hunting method or equipment
1.	District A	May 1 to June 30; September 1 to December 10	Recorded bird calls (c)
2.	District B	May 1 to June 30 (a); September 18 to December 26	Recorded bird calls (e)
3.	District C	April 15 to May 31 (b); September 6 to September 17 (b); September 18 to December 26	Recorded bird calls (e).
4.	District D	April 15 to May 31 (b); September 6 to September 17 (b); September 18 to December 26	Recorded bird calls (e)
5.	District E	April 15 to May 31 (b); September 18 to December 26	Recorded bird calls (e); bait or bait crop area (f)
6.	District F	April 15 to May 31 (b), (c); September 6 to September 24 (b); September 25 to December 26	Recorded bird calls (e); bait or bait crop area (f)
7.	District G	April 15 to May 31 (b), (d); September 6 to September 24 (b); September 25 to December 26	Recorded bird calls (e), bait or bait crop area (f)
8.	District H	April 15 to May 31 (b); September 6 to September 24 (b); September 25 to December 26	Recorded bird calls (e); bait or bait crop area (f)
9.	District I	April 15 to May 31 (b); September 6 to September 24 (b); September 25 to December 26	Recorded bird calls (e); bait or bait crop area (f)
10.	District J	April 15 to May 31 (b); October 1 to December 26	Recorded bird calls (e); bait or bait crop area (f)
11.	District K	September 25 to December 26	Recorded bird calls (e)

(a) Hunting is forbidden within 200 meters of the high water mark of the St. Lawrence River.
(b) Hunting is allowed only on farmland.
(c) In district F, no person shall hunt north of Route #132 between Forgues Street at Berthier-sur-Mer and the eastern limit of Cap St-Ignace municipality.
(d) In District G, no person shall hunt south of Route #138 and north of the rail road right of way located close to Route #132 between Nicolet River in the east and Lacerte Road in the west.

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(*e*) "Recorded bird calls" refers to bird calls of a species referred to in the heading of column 2.
(*f*) Hunting with bait or in a bait crop area is permitted in accordance with Section 23.3.

8. Part VII of Schedule I to the Regulations is amended by adding the following after Table I.1:

TABLE I.2

MEASURES IN MANITOBA CONCERNING OVERABUNDANT SPECIES

	Column 1	Column 2	Column 3
Item	Area	Period during which Snow Geese and Ross Geese may be killed	Additional hunting method or equipment
1.	Zone 1	May 1 to May 22; August 15 to August 31	Recorded bird calls (*a*)
2.	Zone 2	September 1 to September 7	Recorded bird calls (*a*)
3.	Zone 3	September 1 to September 17	Recorded bird calls (*a*)
4.	Zone 4	September 1 to September 17	Recorded bird calls (*a*)

(*a*) "Recorded bird calls" refers to bird calls of a species referred to in the heading of column 2.

COMING INTO FORCE

9. These Regulations come into force on the day on which they are registered.

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REGULATORY IMPACT ANALYSIS STATEMENT
(This statement is not part of the Regulation.)

Description

In recent years, populations of greater and mid-continent lesser snow geese have dramatically risen. The rapid population growth is attributed to increased food availability during winter months from agricultural operations, and a declining rate of mortality. As a result, these birds are no longer controlled by the carrying capacity of winter habitat as they were previously. Analysis of their effects on staging and arctic breeding habitats shows that key habitats for migratory birds and other wildlife are being adversely affected by overuse. Left unchecked, overabundant snow goose populations may become seriously injurious to migratory birds themselves, and will compromise the biological diversity of the arctic ecosystem

To curtail the rapid population growth and reduce population size to a level consistent with the carrying capacity of breeding habitats, the mortality rate must be increased by two to three times the current level. This amendment to the *Migratory Birds Regulations* creates a special season in which hunters may take overabundant species for conservation reasons. This will help protect and restore the biological diversity of arctic wetland ecosystems and the ecosystems of important migration and wintering areas by reducing the population size of overabundant snow goose populations. This will be accomplished by extending the time periods during which hunting may take place (e.g. spring and / or early fall, outside the dates of the regular hunting season). In 1999, this will occur in selected local areas of the Provinces of Quebec and Manitoba. Hunters also will be allowed to use special hunting methods and equipment, including electronic calls, hunt in lure crops, and use artificial or natural bait, each in specified local areas as determined in consultation with the provincial government and local communities.

Finally, this amendment will allow for an increase in the harvest of Ross geese. Ross geese and snow geese frequent the same areas and cannot be easily distinguished when hunting. The Ross goose population can withstand increased harvest pressure because the population size is increasing rapidly, and is at a record high level.

Alternatives

In evaluating the alternatives to the problem of the overabundance of snow geese, Environment Canada's Canadian Wildlife Service (CWS) has been guided by the principle that snow geese are a highly regarded natural resource, valued as game animals and for food, as well as for their aesthetic importance.

The international body of federal agencies responsible for wildlife management, the Canada / Mexico / United States Trilateral Committee for Wildlife and Ecosystem Conservation and Management, designated the mid-continent lesser snow goose and the

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greater snow goose as overabundant populations in March 1998.* They agreed that it would be appropriate for each country to take special measures to increase the harvest of those groups of birds. The United States has just implemented a regulation authorizing the increased harvest of snow geese in that country.

The option of maintaining the status quo is not viable. The rapid increase in population size is attributed to agricultural practices that have greatly increased food availability for geese in wintering areas, and is seriously compromising migratory bird habitats and other wildlife.

Alternatives to increasing harvest levels in Canada, such as allowing hunting in wildlife refuges on the wintering grounds in the United States, are being undertaken. While helpful, these measures being taken in the United States cannot alone meet the goal of reducing the population size adequately. Without such a reduction, staging and arctic breeding habitats will continue to be degraded, the damage will become more widespread, and habitats will cease to support healthy populations of the overabundant species and the other species that share the habitat. Plant communities will not recover unless grazing pressure is reduced; even with such reduction, recovery would take at least several decades because of the slow growth of arctic plant communities. Some of the habitat changes are expected to be permanent. The overall effect would be a reduction of biological diversity. Scientists and managers agree that intervention is required. For these reasons, the status quo was rejected.

Modeling has demonstrated that reducing the survival of adults would be the most effective means of controlling population growth and subsequent size. Actions aimed at reducing productivity are impractical on the broad scale required. Two alternatives to reduce adult survival are available. The first, a government cull by officials, was rejected not only because of the enormous expense that would be incurred on an ongoing basis, but because of the waste of birds that would result.

The second alternative to reduce adult survival, and the one chosen, is to increase subsistence and sport harvest. This method is cost-effective and efficient, as it draws upon subsistence and sport hunters, and will ensure birds are used and not wasted. This method will help reduce overall population size, while ensuring that the intrinsic value of the snow goose population as a valuable resource is maintained.

Benefits and Costs

This amendment makes an important contribution to the preservation of migratory birds and to the conservation of biological diversity in the arctic ecosystem and the ecosystems of staging and wintering areas by protecting and restoring habitat for migratory birds and other wildlife. The amendment will help Canada to meet its

* An overabundant population is one for which the rate of population growth has resulted in, or will result in, a population whose abundance directly threatens the conservation of migratory birds (themselves or others), or their habitat.

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international obligations under the *Migratory Birds Convention 1916* and the amending *Protocol*. Both of these agreements commit Canada and the United States to the long-term conservation of shared species of migratory birds for their nutritional, social, cultural, spiritual, ecological, economic and aesthetic values, and to the protection of the lands and waters on which they depend. This amendment also addresses the *Convention on Biological Diversity*, to which Canada is a party. The *Convention* calls on parties to address the "threat posed by degradation of ecosystems and loss of species and genetic diversity".

The economic benefits of this amendment are considerable. According to estimates based on the 1991 CWS document *The Importance of Wildlife to Canadians*, migratory birds contributed over $1.2 billion in annual direct benefits to the Canadian economy from individuals participating in recreational waterfowl hunting activities. Not only will this amendment generate additional benefits, it will help to reduce economic losses from crop damage, and ensure that these benefits are sustained into the future. Moreover, the selected alternative is the most cost-effective of the alternatives considered.

The amendment will also help to secure the future use of migratory birds as part of the traditional lifestyle of aboriginal people.

Environmental Impact Assessment

An assessment of the environmental effect of the rapidly growing population of mid-continent lesser snow geese has been completed by a group of Canadian and American scientists. The consensus among members of the working group, all with high standing in the scientific community and extensive experience working on arctic habitats, lends weight to their findings. Their analysis, which is contained in the extensive report entitled "*Arctic Ecosystems in Peril - Report of the Arctic Goose Habitat Working Group*", concludes that the primary causes of the population growth are human induced. Improved nutrition from agricultural practices and safety in refuges has resulted in increased survival and reproductive rates of snow geese. These populations have become so large that they are affecting the vegetation communities (on which they and other species rely for food) at staging areas and on the breeding grounds. Grazing and grubbing by geese not only permanently removes vegetation, but also changes soil salinity and moisture levels. The result is the alteration or elimination of the plant communities, which, in all likelihood, will not be restored. Although the arctic is vast, the areas that support geese and other companion species are limited in extent. Some areas are likely to become permanently inhospitable to these species and to other species whose populations are not abundant enough to sustain them over the long term.

Similarly, an assessment of the effect of the rapidly growing greater snow goose population was prepared by another team of Canadian and American experts. Their final report, entitled "*The Greater snow goose : populations, ecosystem concerns, agricultural impacts and recommendations for future management*" was submitted to the Arctic

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Goose Joint Venture Management Board in October 1998. The analysis concludes that the population growth must be stabilized by the year 2002 in order to: (1) reduce the environmental damage already taking place and additional risks to the natural ecosystems on the eastern arctic breeding grounds, the staging areas of Scirpus marshes along the St. Lawrence River estuary and the salt marshes along the Atlantic coast; (2) maintain socio-economic benefits and; 3) reduce agricultural damages in Quebec and the U.S.

To ensure that only the intended populations are affected by the regulatory change, an evaluation plan has been developed, which will carefully track progress toward the goal of population reduction.

Consultation

Since January 1995, the CWS has been working closely with the provinces and territories, the United States Fish and Wildlife Service, Flyway Councils, Ducks Unlimited and other groups to understand the issue and to determine the optimal response for wildlife management agencies. Beginning with these partners in the Arctic Goose Joint Venture of the North American Waterfowl Management Plan, a North American conference was held in January 1995 where the scientific community spoke with one voice on the seriousness of the effect of overabundant populations on arctic wetland ecosystems.

The CWS co-convened an international workshop in October 1995 to hear the diversity of opinions and assembled a scientific team to develop an analysis of the issue and produce the report "*Arctic Ecosystems in Peril - Report of the Arctic Goose Habitat Working Group*". The involvement of Canadian non-government organizations was encouraged in a stakeholders' committee assembled by the Wildlife Management Institute for the International Association of Fish and Wildlife Agencies. With one exception (the U.S. Humane Society), the committee was unanimous on the need for intervention.

A federal / provincial / territorial committee (Canadian National Snow Goose Committee) agreed that intervention is required, and considered the recommendations for management actions. The prairie provinces, Northwest Territories and Quebec are the key jurisdictions. In the prairies, input was solicited from each of three prairie Wildlife Federations through their annual conventions and through the Prairie Habitat Joint Venture Board, the Manitoba Habitat Heritage Corporation Board, and the Alberta North American Waterfowl Management Plan Board in the winter of 1998. Also in the prairie provinces, the CWS conducted a number of surveys of public opinion about management of snow geese. The results showed that all audiences had a high level of awareness of the issue. In addition, a large proportion of landowners and farmers favoured the government taking action. There was strong support for extending the hunting season dates and increasing subsistence harvest.

The CWS consulted with the provinces, the territories, and with northern Wildlife Management Boards. In addition, specific communities such as Arviat and Cape Dorset,

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where there is opportunity to expand community snow goose hunts, were directly consulted and have already been involved in actions to increase their harvest. The Inuvialuit Wildlife Management Board sat on the International Stakeholders Committee.

In early October 1998, the Greater Snow Goose Writing Team of the Arctic Goose Habitat Working Group finalized its scientific evaluation entitled *"The Greater snow goose: populations, ecosystem concerns, agricultural impacts and recommendations for future management"*. The initial draft recommendations were presented earlier by CWS to the Quebec stakeholders Technical Committee in March, 1998. These measures, including extensions of the hunting season and use of electronic calls, were unanimously accepted with the proviso that certain rural communities would be avoided, where bird-watching tourism is very important.

The CWS also has drawn upon the formalized process used each year to consult on annual hunting regulations. First discussion of the need for intervention was presented in the November *1995 Report on the Status of Migratory Game Birds in Canada*. The case was further developed and consulted on in subsequent November *Reports on the Status of Migratory Game Birds in Canada* (1996, 1997 and 1998 issues). Specific alternatives were fully described in the *December 1997 and July 1998 Reports on Migratory Game Birds in Canada; Proposals for 1998 Hunting Regulations*. These documents are distributed to approximately 600 government, aboriginal and non-government organizations, including hunting and other conservation groups such as the World Wildlife Fund, Canadian Nature Federation, and Nature Conservancy of Canada.

This amendment was prepublished in Part I of the *Canada Gazette* on January 30, 1999 for a final 15-day period of public comment. In order to provide stakeholders with every opportunity to participate in consultations, the Regulatory Impact Analysis Statement (RIAS) and regulation were sent to all stakeholders involved in consultations to date, immediately upon publication of the draft regulation and RIAS in the *Canada Gazette*.

Since prepublication, many stakeholders have reiterated their support for the regulation. This includes conservation non-government organizations, the Provinces of Ontario, Manitoba and Quebec, tourist industry representatives, individual hunters, and aboriginal organizations directly affected by this regulation. In conveying their support, some stakeholders emphasized the importance of evaluating the regulation on an ongoing basis. The CWS will continue its monitoring of the goose population and plant communities in affected areas, and will be conducting special harvest surveys of hunters who participate in the new spring / fall conservation seasons.

A coalition comprised primarily of animal protection groups remains opposed to these regulations. The group disputes the evidence of the extent of habitat damage caused by overabundant goose populations, and maintains that natural reduction of population size by starvation, disease and predation is preferable to increased harvest by hunters. The adequacy of consultations, especially with aboriginal groups, is also

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questioned. Finally, the group asserts that the amendment is in violation of the *Migratory Birds Convention, 1916* and the *Migratory Birds Convention Act, 1994*[*].

The overwhelming scientific evidence demonstrates that intervention is necessary in order to ensure the preservation of migratory birds, and to safeguard the biological diversity of the arctic ecosystem. As noted earlier, the option of maintaining the status quo has been rejected because of the continuing long-term negative effects to other migratory birds, plant communities and other wildlife species posed by overabundant populations of snow geese.

As noted earlier significant consultations for this amendment have been undertaken since 1995. This has included direct consultations with aboriginal groups in the most affected areas in northern Canada, either at the community level, or through cooperative wildlife management boards.

Article II of the *Migratory Birds Convention, 1916* imposes limits on normal hunting seasons to provide protection to populations that may be threatened by over hunting. It does not, however, prohibit conservation measures necessary to deal with those populations whose greatest threat may be their own overabundance. Article VII of the 1916 *Convention* supports special conservation measures under extraordinary conditions wherein migratory game birds pose a serious threat to agricultural or other interests in a particular community. This authority is not limited to any time of the year or number of days in any year in either the *Migratory Birds Convention, 1916* or the *Migratory Birds Convention Act, 1994*. Overabundant goose populations may become seriously injurious to migratory birds themselves, thereby threatening the main objective of the 1916 *Convention*, which is to ensure the preservation of migratory birds.

In response to comments and requests from stakeholders during the final stage of consultations, several definitions in the regulation have been slightly modified since prepublication to clarify the intent of the regulations. Also, at the request of the stakeholder group in Quebec, District K (Magdalene Islands) has been added, as has an additional week of hunting in the fall.

Compliance and Enforcement

Enforcement activities will be increased during those times of the year when hunting migratory game birds was not previously allowed. Enforcement officers of Environment Canada and provincial and territorial conservation officers enforce the *Migratory Birds Regulations* by such activities as inspecting hunting areas, hunters for permits, hunting equipment and the number and identity of migratory birds taken and possessed.

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[*] In Canada, the *Migratory Birds Convention, 1916* is implemented through the *Migratory Birds Convention Act, 1994*.

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Under the *Migratory Birds Convention Act, 1994*, and considering case law, the average penalty for a summary conviction of an individual for a violation under the *Act* is estimated to be approximately $300. Minor offences will be dealt with under a ticketing system. There are provisions for increasing fines for a continuing or subsequent offence. However, an individual may receive a $50,000-maximum fine and/or up to six months in jail for summary (minor) conviction offenses, and a $100,000- maximum fine and/or up to 5 years in jail for indictable (serious) offenses. Corporations face maximum fines of $100,000 and $250,000 for summary convictions and indictable offenses, respectively.

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