



Natural Selection, Audubon, and Global Warming

Steve Blank at the Mt. Diablo Audubon Society

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Thank you for the invitation to speak in front of the Mt. Diablo Audubon Society. It's always an honor to speak to the people who actually are Audubon. Having just come from the national board meeting in New Orleans, it's nice to remember that along with birds and their habitat you are the reason why we are here.

It's you, the passionate grassroots that makes Audubon such an effective and unique organization in conservation. As partners in this organization, I'd like to use my time tonight to share with you an issue that all of us on the Audubon board thinks is of paramount importance, and get your help, your ideas, and your energy in solving it.

As I'm sure you are all aware, Global Warming has become topic number one in the environmental and conservation community. You know it must be important when congress starts holding hearings *after* an election to talk about it, and we must be in real trouble when big business starts to stand up and says something has to change.

To me, one of the interesting parts of the global warming discussion is what's not being said. Given the facts about global warming are becoming indisputable, why is it that many people simply refuse to believe it's true and if they do why isn't a major point of concern for everyone? Why are most people apathetic to a threat which may cause changes on a biblical scale across the globe?

Some people think Global Warming has the flavor of an ideological debate, that is it's another red state versus blue state issue. That it's just about politics. While others contend economic self interest is fueling the denial. I have another opinion. And it starts by giving some thought about where we are having dinner this very evening. We are sitting less than 5 miles from the Hayward Fault, one of the most active and destructive earthquake fault zones in California. The U.S. Geological Survey gives this one fault over a 25% chance of producing a 7.0 earthquake in the next 20 years. That's big enough to level this place and everything around us. Yet here we are calmly eating dinner, and none of you, (at least as of yet,) have used that as an excuse to run out of the room and go home early (if this speech gets boring you now have an excuse.) And chances are if you live in the San Francisco Bay area you are also within 5 miles of an equally destructive and active fault zone. And while I'm sure some of you may have bolted your house to the foundation, know how to turn off the gas supply and might have packed some earthquake supplies, none of you have decided to pack up and move to Kansas.

Perhaps it's something about our wonderful weather? Our low cost of housing? Ease of commuting on our uncrowded freeways? Maybe it's just that Californians are the only



ones who laugh in the face of clear and present danger? Of course not. All one has to do is look at a hurricane map of the Gulf and Atlantic coasts. Even after Katrina hit New Orleans, and the gulf coast got pounded by a series of direct hits from multiple hurricanes, beachfront condos continued to be built and bought. Housing is built right to the beachfront in most states directly at risk for hurricanes.

And perhaps we put trailers in the middle of tornado alley in Kansas and Oklahoma, and purposely don't tie them down, so we can have great photo opportunities later? I don't think so. Then perhaps this is just part of the unique American culture. After all we're risk takers, and adventurers; our national culture extols that we were the people who came to this country with pennies in our pockets. Risk taking is part of who we are.

But no, when you look at the record this isn't just an American phenomena. Look at the villages built on the side of active volcanoes. Look at the towns and cities rebuilding again on the rubble of houses destroyed by the 2004 tsunami.

Earthquakes, floods, drought, and other natural hazards continue to cause tens of thousands of deaths, hundreds of thousands of injuries, and billions of dollars in economic losses each year around the world. Yet humans knowingly put themselves into harms way. Why? And what on earth does this have to do with Audubon, Global Warming, and the Mt. Diablo Audubon Society and birds? Bear with me.

I think these stories all point to something much more fundamental than our collective sense of adventure or risk taking. I propose that there is something innately ingrained in all people of all cultures in all countries – and that's how we measure and judge risk.

How we measure and judge risk

Sitting around here tonight it's hard to imagine how recent the veneer of civilization and culture we take for granted is. It's less than 10,000 years ago that humans were hunter gathers. Life was short and brutal, and while estimates vary scientists' believe that people lived to the ripe old age of 30. You can imagine the daily risks that people faced. As a hunter gather you either killed food or became food. You were in danger of starving or dying on a daily basis. You were a rung on the food chain and in most locations, not necessarily on the top rung. You had to be constantly alert and attuned to the subtle changes that were occurring around you for food and for escape— on a second by second basis. I know that all of you have at one time or another experienced an adrenaline rush – the fight versus flight reflex when facing danger. Your heart rate and blood pressure increases and your body gathers strength and speed for self preservation. Nowadays it's probably not a saber toothed tiger or a mastodon charge, but more than likely a car accident or a mugging. The key point is that dealing with short term threats was so important to our survival as a species that we developed a specific operating mode to deal



with immediate threats. Now even though these threats are gone we still have this impulse hard-wired into our bodies and we pass it on to our children.

Besides this immediate reflex, to survive you also needed to understand the seasonality of your food sources, plants, animals you hunted. You had to get in touch with your preys migration, feeding, and mating patterns. You truly had to know how and where they lived. Therefore while hunter gatherers had the Audubon sensibility of “connecting people with nature” our long range planning horizon was limited to one entire year, and our connection to nature was designed so we could kill and eat them.

Importantly, not only was there was no survival benefit to think further than a year it was detrimental. Think about this for a second. For the several million years after humans left the jungle and stepped out onto the savannah onto two hind legs, our survival was predicated on being attuned to what was going on around us in real time and with a maximum planning horizon of one year. And limiting that view to immediate threats and one year was the difference between life and death. It was a pretty cruel Darwinian selection for those who thought differently. Because any Neolithic hunter who paused long enough and began to think about plate tectonics, magma chambers under active volcano’s, or “gee isn’t that a pretty hooded warbler,” quickly became someone’s high protein meal.

So what does this mean about our judgment about long term risks?

I contend we take make poor judgments about long term threats because of millions of years of natural selection have operated on our gene pool and the attendant brain chemistry, thinking process and physical reflexes, all to focus us on the short term. It’s been less than 10,000 years from the Agricultural Revolution to the Industrial Revolution. When we started farming we no longer needed to put our life on the line for dinner. Crop failure was not the same clear and present danger as getting charged by a wild boar.

Today we now live longer, and we put ourselves and families at risk for extended period of time, yet we don’t perceive we are taking any risk at all. This is because *our species is not wired to viscerally evaluate anything other than immediate life threatening risk*. Long term threats are not part of our DNA, they don’t raise our heart rate, blood pressure or respiration rate.

This doesn’t mean we can’t evaluate a long term threat, it just means we have to consciously engage a different part of our brain than the automatic reflexes we use to evaluate and respond to short term threats. If you don’t believe it, let’s all go outside and try running across the freeway and when we get to the other side, lets compare that to how that felt versus how we feel living on an earthquake fault. The point is, that to evaluate long term threats to our lives and our society we have to engage the thinking part of our brain, not the part with automatic reflexes.



Second, yet equally important, is that not only are we designed to focus on the short term, *we are wired to ignore long thinking*. As a species, long term thinking was not only way down on the priority list, it was down right dangerous. Spending all your time worrying about every potential future risk was selected out from our brains, because it got in the way of dealing with more immediate risks. Therefore there is no flight versus flight reflex for long term risks, because that type of thinking was a negative of natural selection for an individual. Great short term thinkers equaled a life long enough to have children, great long term thinkers equaled someone's lunch, usually before you had kids. So that for most of our history, there was no long term past a year.

And in fact for our survival so far, this focus on the short term and ignore the long term, has been a pretty successful technique for humans. The geologic record is pretty clear. Our species has lived through multiple ice ages and massive environmental changes the likes that no one in the last few thousand years have seen. Yet even though there were long term changes in our environment our ancestors dealt with them, not by worrying about them, but moving with them. When the food supply moved, we moved – or we died.

So what's the big deal about global warming?

On first thought this is reassuring. If these catastrophic changes happened in the past when people were around it means we've dealt with it before and we can do it again. Obviously we are smarter, have more tools, technology and resources than anyone living in a cave or hut.

This might just be our creators' cosmic joke. Because for the first time in the millions of years of human evolution our species is actually less resilient and less capable of responding to long term global changes in the environment. Why? Throughout most of our history when sea levels rose, ice ages came and went, or deserts appeared, our hunter gather forebears packed up and moved. The nomadic nature of humans for millions of years simply depended on what they could carry with them.

Agriculture and the rise of cities ended that for all time. We are now dependent on place. That is we are dependent on specific places doing specific things at specific times. Our lives in California depend on farms that grow corn, wheat and soybeans in the Midwest, vegetables from our central valley, water from the melting Sierra snow pack, and fish from inland and oceanic fisheries. And not only is that a matter of place, it's a matter of a narrow band of temperature and weather and the climate that supports it.

Because of the short term nature of our thinking we tend to forget that our cities and in fact our entire country is built on top of a set of assumptions and data about rainfall, food production, and temperature that is at best only two hundred years old. Think about that for a second. Where our water and food come, where our cities and homes are built



depends on a geologically infinitesimally small amount of information. But that's OK because we don't make long term decisions. The ocean looks pretty, let's build our house and city on its shoreline.

So now to the part of the story about global warming

There is a growing scientific consensus that our weather and our sea level is about to take a precipitous change. This is not just a California problem, though if temperatures continue to rise our entire water supply which depends on the Sierra snow pack is threatened. This not just a problem for the United States, though if rain patterns change over Midwest a large number of the fertile parts of our country may yet again become dust bowls. Nor is this just a problem of poor countries because not even the richest countries have figured out how to stop their cities from being flooded if sea levels continue their predicted rise. And while we have dealt with regional disasters in our lifetime; earthquakes here at home, hurricanes in the south, even a volcano in the northwest – we never had to imagine or plan for long term changes that were planet wide. It is beyond anything anyone or any nation had to deal with – at any time in our history since we settled down into cities. Today we have much more to lose, and while we are more advanced, we are ever so much more fragile and our society more brittle. Unless we acknowledge that we are facing unprecedented change we could face complete breakdown of societies and civilization.

We are no longer hunter gathers who could pack up and carry our lives on our backs. We've had an inkling of what a drastically changing environment would look like in the United States when we saw images of Katrina victims swimming for their lives.

All of this at risk because we have no wiring in our brain for long term risk assessment. Our denial and apathy is a function of natural selection, yet our long term survival depends our ability to use another part of brain to think about this threat.

Audubon's Role in Global Warming

I hope that the part about the reality of global warming is clear to at least to this audience here tonight. I know there are a lot of people across the country that are still skeptical. They seem to fall into two categories; it ain't really happening and all the press about it is Hillary Clinton's scheme to get elected president. (This reasoning breaks down when you point out that in California governor Schwarzenegger is a Republican and is leading the effort to stop it.) Or, "well yeah, but the environment has changed by itself throughout history, and people have nothing to do with it."

I think our greatest strength as an organization is our connection to nature. As one would expect, organizations that are close to nature get to see, hear and feel these changes first



hand. It's an intellectual exercise inside a building in front of a computer, but tangibly real when you are out in the field, forest or ocean.

Throughout history humans have used birds as indicators of change. Hunters would use them as unintentional guides to follow back to food and water sources. In the last 200 years an expression of "just like a canary in a coal mine" came to refer to the use of caged canaries that were carried by coal miners to detect the presence of lethal methane gas. If the canaries fell off their perch it was time to drop your pick and get out of the mine.

The National Wildlife Federation and the American Bird Conservancy just recently published a pamphlet called "a Bird Watchers Guide to Global Warming." In it they give many examples of birds as "canaries in the coal mine" for all us as harbinger of climate change. Let me share a few with you.

A study by Price and Root of 35 North American warbler species, found that the range of seven of the Warbler species (including the Blue-winged Warbler, Golden-winged Warbler, Black-throated Gray Warbler, Pine Warbler, Hooded Warbler, and Cape May Warbler) has shifted significantly farther north in the past 24 years, by an average of more than 65 miles. By comparison, none of the species in the study were found to be farther south. Similar trends in a study by Oedekoven in 2001 have been discovered among some seabirds, such as the Sooty Shearwater, whose migration route has shifted toward cooler northwestern areas of the Pacific in response to rising sea temperatures off the coast of California.

There are also signs that recent climate trends are affecting birds' behavior. Studies (also by Price and Root) in the US and Europe have found that some songbirds are migrating earlier in spring months, corresponding with warmer temperatures. For example, research of migratory birds in North America shows that the arrival dates of 20 species were up to 21 days earlier in just the 30 years from 1965 to 1995, while just a few species were later. This includes long-distance migrants like the Rose-breasted Grosbeak, Black-throated Blue Warbler, and Barn Swallow. Similarly, North American Tree Swallows are now nesting up to nine days earlier than 30 years ago, corresponding with an increase in average spring temperatures. Because this shift is occurring throughout the species' broad habitat range, scientists believe that the birds are responding to larger trends than just local climate variations.

These changes may be occurring regardless of whether the birds' arrival is synchronized with the availability of food sources such as insects, flowers, and berries at their destination habitat. Global warming may cause migration and nesting to get out of step with food supplies. As a result, the "early birds" *may not* get the worm.



For example, scientists at the Rocky Mountain Biological Laboratory in Colorado, have discovered that American Robins migrating to the region arrive an average of two weeks earlier than they did 23 years ago. They attribute this shift to the likelihood that the birds are responding to warmer temperatures at the lower altitudes that typify their wintering grounds. The problem is, they are arriving at their higher-altitude summer breeding grounds only to find that there are still winter conditions there. There is now a 65-day gap between the date of the first robin sighting and the first date of bare ground at the snow measuring station, 18 days longer than in 1981. As a result, the birds must wait longer for the snow to melt before they can feed and may be at a greater risk of starvation.

In other cases, in a study by Both and Visser, migratory birds are arriving *too late* for optimal food availability. The Pied Flycatcher, for example, spends its winters in tropical Africa and migrates north into Europe in the spring. Since 1980, the average spring temperature in parts of Europe has risen about 5.4 degrees Fahrenheit, and the peak insect populations (with which the birds' breeding coincided) have consequently shifted to earlier in the year. Their environment in Africa, however, has not changed significantly, and the birds are still migrating north about the same time as usual. When they reach their breeding site, they have to find their mates and lay their eggs quickly in order to capitalize on available food, which may already be past its peak. Consequently, the birds are raising fewer offspring.

Sea-level rise could also inundate important coastal habitat in many places. Without meaningful action to reduce greenhouse gas emissions, climate scientists project that sea levels could rise anywhere from ¼ to 3 feet in this century. This would have major implications for the more than 150 species of migratory waterfowl, shorebirds, and other birds that rely on coastal marshes in the mid-Atlantic region for nesting, feeding or roosting.

To those who spend time listening and connected to nature these are all concrete examples of what birds are telling us about climate change. We can hear them because we've learned their calls; we need to communicate their message to those who can't.

Audubon chapters are the bridge between our propensity for short term action and our apathy about long term thinking. By using the changes we see in birds and their habitat we have the examples to communicate the radical changes that will occur in the life span of our children.

Here's what the Audubon National Organization is going to do about Climate Change

Last weekend, the Audubon National board meeting was held in New Orleans as we discussed global warming. The irony of our meeting location wasn't lost on us. I believe in 20 years, New Orleans will be known as just the first of many major casualties of



climate change. Watching the Mississippi flow by over my head behind the levees, it wasn't lost on me that the city was also a great symbol of how we are wired to ignore even the most obvious long term risks. Instead of screaming "run away fast," or even "lets calculate some potential escape routes" my reaction along with everyone else was "let's get another drink" on Bourbon street.

The Audubon National Board voted last weekend to make climate change Audubon's highest conservation priority. This week John Flicker joined several of our Green Group colleagues in a series of private meetings this week with Congressional leaders of this issue. (By the way, the Green Group is a coalition of 10 or so environmental groups such as the Sierra Club, Environmental Defense, Defenders of Wildlife, etc. We've found that when we can, speaking with one voice in Washington gets our voice heard above the noise.) On the House side, the Green Group met with Rep. Henry Waxman, Chair, Oversight & Government Reform Committee; Rep. John Spratt, Chair, Budget Committee; and Rep. Steny Hoyer, Majority Leader. On the Senate side, they meet Sen. Barbara Boxer, Chair, Environment & Public Works Committee; Sen. Richard Durbin, Majority Whip; and Sen. Harry Reid, Majority Leader.

The Green Group conveyed a message that climate was top priority of all of our organization's and that we are all working together and with our collective memberships to build support for strong federal legislation. Momentum is building in Washington for early action. Each member they visited was very engaged on the issue and eager to act. However, we are a long way from the votes needed to pass legislation that will actually solve the problem. Without clear signals to the business and finance communities about capping emissions, businesses will not begin to make the changes that are needed. We have our work cut out for us.

What Can you as a Local Chapter do?

Every conservation organization in this Green Group is working hard to raise public awareness and to provide people with specific actions they can take to slow or stop climate change, beginning today. These include taking responsible action to cut emissions of carbon dioxide and other greenhouse gases, to slow global warming and help reduce the threat it poses to people and wildlife alike.

John Flicker and the Audubon board believe that the role of our chapters in this is critical. And yes, that in our battle of global warming our grassroots is our greatest asset in the climate change discussion. While it's great we have now have access to politicians who will meet with us, all politics is local. We will not see substantive changes until our local, state and national leaders hear from the voters elected them not just the lobbyist.



The changes that need to be made are so extreme that few politicians will engage the long term thinking part of their brains unless they hear that millions of others have done so as well. Audubon's greatest contribution to help stop global warming will be the ten's and hundreds of thousands of grassroots members who can educate and mobilize others; others in Audubon and others who are simply your neighbors and friends. Challenge them to think about the long term, and the consequences for their children.

In Summary

Long term thinking is hard work, sustaining long term plans and actions are even harder. After this evening perhaps you have an idea why. Global warming is real; it will affect us and certainly will change the lives of our children.

Your most effective role is to speak out and share what you see changing around you; educate others who aren't as close to nature. And insist that even though this a long term problem we need to act now.

Make your voices heard to local, state and national policy makers and let them know, that while we are not wired to deal with long term threats, we are smart enough to have this climate change issue raise our heart rate.

You as Audubon chapter members understand that birds and their habitats are harbingers of all our fate, and that if we are here on this earth as stewards for what is around us, then our role is clear. *Every Audubon member need to be the canary in the coal mine.*