Moms & Cubs | Polar Bear Hybrids | Ice In, Ice Out

TUNDRA TIMES

The Annual Newsmagazine of Polar Bears International

Fall 2012

My Planet. My Part.

The Making of a Polar Bear | Shrinking Sea Ice

A celebration of polar bears.

That's how it all began for Polar Bears International some twenty years ago … then under the name of Polar Bears Alive.

PBI's history started with an intrepid band of bear-watchers at Cape Churchill in the 1980s, back in the early days of tourism there. The loose-knit group returned year after year during the fall migration, drawn to the polar bear's power and beauty and enthralled by the arctic ecosystem. From that band of polar bear enthusiasts emerged a small nonprofit, founded in 1992 by the polar bear's most passionate champion, photographer Dan Guravich.

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Things seemed so simple back then: The polar bears were fat, the ice stood firm, and threats of global warming seemed distant and abstract.

But just as the polar bear evolved from brown bear ancestors to become the ice bear known today, so we evolved from a passionate group of polar bear enthusiasts to become the international force we are today.

That transformation began in 2002 when Robert Buchanan, PBI CEO and co-founder, changed our name to reflect our international scope and broadened our reach from a mainly educational organization focused on polar bears to one guided by the world's leading polar bear scientists, including Dr. Steven C. Amstrup, Dr. Andrew Derocher, and Dr. Ian Stirling. And because the research of these renowned scientists demonstrated the link between global warming and polar bear survival, we shifted our focus to *action*, spearheading education and stewardship programs that work with communities to inspire change.

Solving a problem as large as global warming is a huge task. But we're joined in this effort by the more than 50 zoos, museums, science centers, and aquariums in our Arctic Ambassador Center network, by our Leadership Camp graduates, by our partners and members, and by the committed individuals who take part in greenhouse gas reduction efforts through our outreach.

We're tireless in that outreach—and we're beginning to see real momentum and change, with a goal of making a polar-bear-friendly lifestyle the norm, not the exception.

In the face of inaction on the part of our leaders, it's increasingly clear that it's up to us. And the good news is that a groundswell of support for a new paradigm is taking hold. We're heartened by this movement. We're determined to succeed.

And with you on our side, we're up for the challenge.

inside

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ON THE COVER: PBI is fully committed to supporting and distributing fact-based, scientifically sound research and information about polar bears and their arctic habitat. We truly hope you are as inspired by the distinctiveness and magnificence of this irreplaceable creature as we are.

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Dan generously provides PBI with total access to his award-winning images free of charge.

Courtesy Indianapolis Zoo © Matt Mays

PBI Scientist Honored with 2012 Indianapolis Prize

As a young biologist selected to lead a polar bear research team for the U.S. Geological Survey more than thirty years ago in Alaska, Dr. Steven C. Amstrup, PBI's chief scientist, felt he had been handed the ripest plum in the profession.

"It was an animal that we didn't know much about, that was hard to study—this giant, white bear roaming around an environment that looks like the moon," he says. "What greater challenge and more interesting subject?"

Studying polar bears meant enduring subzero temperatures, a shifting icescape, and tremendous logistical challenges. But the data gained have added greatly to the world's understanding of this iconic symbol of the Arctic—and eventually helped lead to the listing of the polar bear as a threatened species because of global warming.

In recognition of Amstrup's tremendous contributions to polar bear conservation, including the tireless outreach he continues today, he was honored as this year's recipient of the Indianapolis Prize, the *world's leading award* for animal conservation. In a gala ceremony in Indianapolis this September, he received $100,000 and the Lily Medal.

"Hope that the iconic and endangered polar bear may survive is due in large part to Dr. Amstrup and his team," the Indianapolis Prize Committee said in announcing the selection. "Amstrup's three decades of polar bear research and his unwavering conviction that solutions can and must be found are creating new optimism that polar bears can be saved from extinction."

Robert Buchanan, CEO and co-founder of PBI, said that Amstrup's dedication to polar bear conservation has helped the world understand that the deterioration of the polar bear population is at our doorstep, while verifying this is not an irreversible situation.

"Steven's passionate outreach has helped the world understand how sea ice losses from a warming climate threaten polar bear survival," he said. "His message is one of hope and determination to have future generations see polar bears roam free in the Arctic."

The Making of a Polar Bear

An Evolutionary Tale

When did the polar bear become a polar bear, built for cold and a life on the sea ice? Until recently, scientists thought the great white bears evolved about 200,000 years ago from brown bear ancestors.

But new information from genome studies suggests that the separation may have begun as early as four or five million years ago, with occasional interbreeding between the two species over the course of a long history leading to today's specialized ice bear.

If this new interpretation is true, it means that ancestors of the polar bear first split from brown bears during the warm Pliocene epoch and survived several warm periods of the distant past. But what's known and unknown about polar bear evolution? And what does this mean about their ability to survive in today's warming world?

First, it's important to remember that the polar bear's early history is still an unresolved and tantalizing mystery. Although the polar bear may have begun to separate from the brown bear four or five million years ago, scientists don't have a clear conception of the appearance or behavior of those early ancestors.

A fossil from 120,000 years ago proves that polar bears at that time were essentially like modern bears—but no earlier fossils have been found, so exactly when polar bears developed adaptations to cold and ice remains unclear. Just as our earliest ancestors were very different from modern humans, it seems likely that if polar bears did first diverge during a warm period of the distant past, they were very different from the highly specialized sea ice predator of today.

"We don't know feeding strategies of the polar bear's earliest ancestors," says our chief scientist, Dr. Steven C. Amstrup. "But we do know that modern polar bears depend on sea ice for access to their prey and will disappear without it.

"Unless we reduce greenhouse gas emissions, the current arctic warming will eventually exceed anything modern polar bears and their ancestors have experienced. The world won't warm to some new level and stabilize, and it won't cool down as in past climate cycles. This is a very different challenge."

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Pizzlies? Grolars?

Every so often, a polar bear-grizzly hybrid makes the news, leading to speculation that a new species is emerging in response to global climate change.

While certainly a curiosity, scientists have known for decades that polar bears and brown bears will interbreed in zoos. And new research shows that the two species have swapped genes sporadically throughout the polar bear's long evolutionary history.

Is this a love affair in the making? Reality is that it's probably no more than occasional interbreeding in places where polar bears and grizzly bears have adjacent ranges: That is, where the polar bear's sea ice habitat meets the land where brown bears roam.

Some have speculated that crossbreeding provides hope for polar bears. But PBI's chief scientist, Dr. Steven C. Amstrup, emphasizes this isn't the answer to the polar bear's dilemma.

"To the extent there may be increased hybridization, it probably will be of little consequence to polar bears facing dramatic declines in their habitat base," says Amstrup. "Polar bears are likely to starve out of their present ranges long before their genes are swamped by those of grizzly bears. And even if some of their genes persist in grizzly bears, that fact will be irrelevant with regard to efforts to retain the magnificent and highly specialized life form we now know as the polar bear."

Rather than playing roulette with the future of the polar bear gene, why not sidestep the uncertainty altogether? Please join us in our efforts to drastically reduce greenhouse gas emissions to save polar bears and their sea ice home.

Den Studies

One, two, three little cubs popping out of a snow den: What a surprise to our maternal den study team!

Polar bear triplets are rare in the best of times, so it was especially heartening to see three cubs in today's more challenging environment.

Every year, our den study team heads to Alaska's North Slope in late winter to set up hidden cameras. Protected from sub-zero temperatures by insulated coolers, the cameras record the behavior of polar bear mothers and cubs as they emerge from their maternity dens.

Prior to the study, little was known about polar bear denning behavior. The knowledge gained will help us gather information on the health and behavior of the species during this critical and sensitive time period.

Special thanks to Dr. Tom Smith, professor of biological sciences at Brigham Young University and a member of our Scientific Advisory Council, for leading the study, assisted by a team of graduate students and PBI's director of field operations, BJ Kirschhoffer.

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My Planet. My Part.

It's easy to feel overwhelmed by a problem like global warming: It seems so vast, so out of your hands.

But the truth is that if we do nothing, we'll never gain the traction to turn climate change around. That's why we invite you to join us in working together to find solutions—a process that begins with breaking this huge task into small, manageable parts that empower each of us and creates momentum for change.

You might begin by recycling plastic water bottles. Then take it a step further and switch to reusable containers. Before you know it, you're questioning countless choices in your daily life:

Do I really need to wash my clothes in hot water? Why do I keep appliances plugged in when I'm not using them? Why waste gas by idling my engine when I could park the car and walk inside? Or better still, ride my bike …

"We envision a day when having a large carbon footprint will be as socially unacceptable as drunk driving. That goal is entirely possible and we're working on it, person by person, business by business, and community by community, on up to the highest levels."

– Robert Buchanan
PBI CEO and Co-founder

Soon, these small daily actions will become habits.

But it doesn't end there. Green habits that begin with individuals multiply within communities to become social norms. And that's our goal.

You can become part of this powerful movement by joining us on the new *My Planet. My Part.* section of our website, an online community center where individuals and groups can gather to learn and be inspired, commit to reducing their carbon footprint, illustrate their actions, and share ideas.

We invite you to join us in becoming part of the solution—and have fun, make connections, and gain a sense of *hope* along the way.

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A Lifestyle Primer

Confused about what you can do as an individual, business, or community to help polar bears? An easy rule of thumb to follow is to Build Green, Live Green, and Choose Green in your daily life.

Build Green This is the infrastructure of your home and workplace: Insulate, use green power, weatherstrip doors and windows, and invest in energy-efficient appliances. On a community scale, this means things like bike lanes, public transportation, and recycling and composting programs.

Live Green Let sustainable behaviors guide your everyday actions until they become habits: Take shorter showers. Don't idle your car. Eat less meat. Line-dry your clothes. When shopping, ask yourself, "Do I really need that?"

Choose Green Vote with your wallet and in the ballot box in support of a sustainable future.

Time remains to save polar bears, but we must act soon. We invite you to encourage others to join you—because living green is COOL!

Polar Bear Cam Returns

Polar bears sparring. Polar bears stretching. Polar bear cubs snuggling close to mom.

Once again, we're offering a rare window onto the polar bear migration in Churchill, Manitoba, with our live Polar Bear Cam. It will stream during daylight hours, Central Standard Time, from late October to mid-November, on the PBI website and on the site of the cam's sponsor, explore.org.

Watching the cam is almost like being there as the bears gather along the shores of Hudson Bay—but with no parka required.

The Polar Bear Cam comes to you courtesy of a partnership between PBI, Frontiers North Adventures, and explore.org, the philanthropic media organization and multi-media arm of The Annenberg Foundation. The cam joins a variety of live video feeds on explore.org that comprise Pearls of the Planet, an initiative that aims to help people fall in love with the world again.

A Home Melting Away

© KT Miller/Polar Bears International

Arctic sea ice is a dynamic system, with the frozen habitat on which polar bears roam pulsing and changing from season to season.

Winter in the Arctic brings frigid temperatures, twenty-four hours of darkness, and an expansion of the ice where polar bears stalk seals. Summer brings warmer temperatures, twenty-four hours of sunlight, and shrinking ice.

The ice forms. The ice retreats. It's part of the Arctic's natural rhythm … an age-old pattern guided by variables from wind, weather, and currents, with some good ice years, and some not so good.

But human-induced warming has led to a dramatic retreat of the summer sea ice in recent years, with sea ice losses far exceeding the natural pattern—leading polar bear and climate scientists to closely track the sea ice retreat in summer and monitor its affect on polar bear populations.

Record Summer Losses

The summer of 2012 was one for the record books, with August sea ice losses plunging below the previous record set in 2007 and reaching the lowest levels recorded since satellite tracking began.

Dr. Cecilia Bitz, a sea ice and climate expert at the University of Washington says the Arctic has experienced more sea ice losses in recent years primarily because the sea ice is thinner at the start of the melt season, so it melts more easily.

The scientist says that this year's losses were influenced by record high temperatures in July in the Northern Hemisphere, warmer temperatures over the previous three months, and possibly by a large storm off the northern coast of Alaska.

"Factors like these cause natural variability in the sea ice," Bitz says, "but they now have a greater effect because the ice is thinner. Sea ice can only continue to thin as greenhouse gas concentrations in the atmosphere rise. Therefore, even if natural variations result in good conditions for sea ice formation, any recovery in sea ice extent could only be temporary."

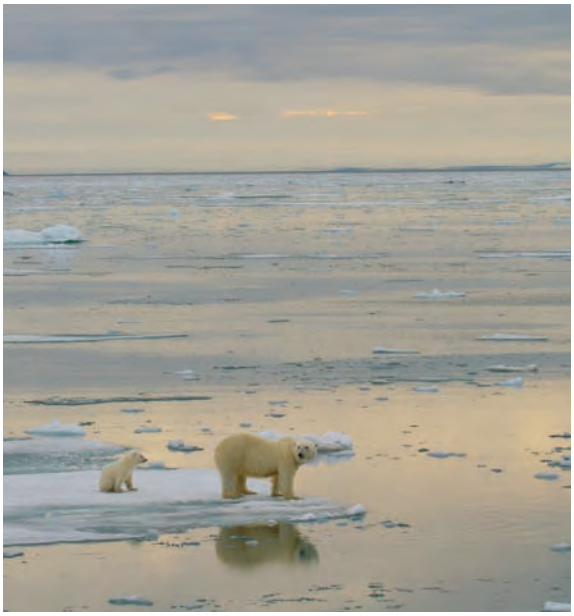
A Changing Arctic

Until recently, enough sea ice traditionally remained in many parts of the Arctic for polar bears to hunt all summer long. But warmer temperatures—caused by increasing concentrations of CO_2 and other greenhouse gases—have led to larger and larger ice-free areas, leading polar bears in many parts of the Arctic to embark on long swims in search of a platform of ice. These swims are especially hard on young cubs.

Polar bears in the southern part of the polar bear's range, like Western Hudson Bay, face a problem of a different sort. They live in a seasonal ice ecoregion where the sea ice melts entirely in summer, forcing bears ashore. During the on-shore period, the bears have only their stored fat reserves to live on until the ice returns again in late fall—a fasting period of at least four to five months. The problem in these seasonal ice areas is that breakup in the summer is occurring progressively earlier, while the freeze-ups are coming later—reducing feeding opportunities and prolonging the summer fast.

"The longer and longer ice-free periods are especially hard on females with cubs because they need a supply of fat in order to produce milk to keep their cubs alive. Now that females are coming ashore with less fat after breakup, it's beginning to negatively affect cub recruitment," says Dr. Ian Stirling, Research Scientist Emeritus with the Canadian Wildlife Service and a member of PBI's Scientific Advisory Council. "Ultimately, there is simply a limit to how long the bears can fast."

At some point, without action on climate change, the entire Arctic will become ice-free in summer. Monitoring sea ice trends each year gives us a better sense of when it will disappear entirely. But we already know that if we don't reduce greenhouse gas emissions, it ultimately will disappear. The only way to ensure the polar bear's survival is to reduce emissions and retain as much sea ice as possible.



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Ice In, Ice Out

Every year, polar bears along Hudson Bay are forced ashore by melting ice in summer, where they must live off their fat reserves until freeze-up takes place in the fall.

When the ice breaks up, the bears ride ice floes ashore to the Hudson Bay coastline from the Ontario border in the south to the Nunavut border in the north. Then they pad quickly back onto the sea ice when it forms again in the fall.

These predictable movement patterns allow scientists to observe a large sample of the population in a short period of time and provide them with an optimum opportunity to monitor changes in its composition.

Why is this important? Polar bears' energy reserves are at their greatest just after break-up and lowest just before freeze-up. Therefore, annually repeated counts at these times may provide an index to trends in survival and hence the welfare of the Hudson Bay bears. Ultimately, as sea ice continues to disappear due to global warming, coastal surveys may provide an important index to polar bear welfare range-wide.

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It takes a village…

This holds true in every instance where you're trying to enact expansive change. But with an issue like global warming, a phenomenon that's impacted by and impacts every latitude, it takes the world.

To change a global culture—to move it, say, from habits of conspicuous consumption to sustainability—often begins with a community change agent who leads the way and inspires behavioral change.

We've been successful in finding such leaders through our network of Arctic Ambassador Centers—which includes over 50 of the world's leading zoos, museums, science centers, and aquariums—along with graduates of our Leadership Camps and participants in programs like our Project Polar Bear contest.

The small town of Sparta, Wisconsin, is a great example of what's possible. The town's transformation began in 2009 when it was selected as one of the planting sites for our Polar Bear Forest®, a project funded by donations raised by chapters of the American Association of Zoo Keepers.

With volunteers from across the community pitching in to help plant trees, the connection between individual actions and saving arctic sea ice was effectively driven home. And from there, a team of three students in Sparta High's Earth Club took part in our CO_2-reducing Project Polar Bear contest, becoming one of the finalist teams. Since then:

- Sparta High's Earth Club convinced the school to eliminate disposable utensils and trays in the cafeteria
- Distinctive Polar Bear-als—white recycling barrels designed by Earth Club members—collect aluminum cans throughout town and at industrial sites
- Sparta High is adopting a "No Idling" campaign to eliminate emissions from vehicles in carpool lines
- Century Food has joined the movement, increasing the recycling rate of its four plants from 17% to 94%, reducing water usage by 35%, and saving $139,000 per year from energy reductions
- The chamber of commerce has sent letters to all its members encouraging them to join a recycling think tank
- The town has embraced bicycling in a big way, converting old railroad tracks into biking paths
- The community continues to plant trees and the high school is working towards achieving zero garbage

Sparta's conservation story has inspired residents to think about their daily actions and change wasteful habits. The ethic has spread and green lifestyles are taking hold.

Transformations like these are what we strive for at PBI, working from the ground up and across communities to effect the change needed to save polar bear habitat and ensure a brighter future for the planet.

Say…Seals?

If you visit Churchill this year, you may run across some citizen scientists without even knowing it—or receive an invitation to become one yourself.

What's this about?

Based on projected future sea ice losses, two-thirds of the world's polar bears could disappear by mid-century. In recent decades, researchers have shown that declining sea ice availability in the Western Hudson Bay—home to the most accessible and well-studied polar bear population—has led to progressive loss of body condition, resulting in lower reproduction and increased mortality.

Public perception, however, doesn't always match research results. Despite abundant scientific information, many tourists, tour company personnel, and local residents don't perceive body condition or stature to be declining; nor do they recognize that fewer cubs are present in the Churchill viewing area than there used to be. These perceptions contrast with scientific data, which can lead to doubt and confusion about the threats to polar bears from global warming.

PBI's new Citizen Science Project, conceived by PBI's Chief Scientist Dr. Steven Amstrup and conducted in collaboration with Dr. Merav Ben-David of the University of Wyoming, will record whether changes in polar bears in the Churchill viewing area mirror those in the rest of the Western Hudson Bay population. As part of a long-term monitoring strategy, Ben-David's students will work with PBI staff and citizen scientists to develop a photographic record of the condition and population composition of the viewing area bears.

Buggy drivers, tour guides, and Churchill visitors will document the sex and age groups of bears observed and use a laser device to measure the size and condition of observed bears. The lasers will provide yardsticks by which photographed bears may be accurately measured. Stature will then be measured using state-of-the-art statistical procedures to analyze trends between seasons in polar bear measurements. Ultimately, this technique will allow comparisons among different geographic regions.

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"People learn in different ways and visual information is one of the most powerful," says Dr. Ben-David. "Over multiple years, such records will help to communicate the undergoing changes taking place in polar bear condition. This is especially helpful in situations with a shifting baseline, where year to year differences may be hard to see, but are quite dramatic when viewed over time."

Our thanks to SeaWorld for funding this study, with additional support from the Pittsburgh Zoo & PPG Aquarium.

Tundra Connections

Tundra Buggy® One has to be the world's coolest classroom: Rumbling across the tundra on big, fat wheels with majestic polar bears and other arctic wildlife roaming outside. Whether you're a teacher, a student, or a polar bear enthusiast, our live broadcasts during the polar bear migration along Hudson Bay offer an unparalleled chance to meet scientists, ask questions, and share in a tundra adventure—all from the comfort of home.

Most important, you'll leave with tools and resources to help polar bears, fired up and ready to make a difference!

We'll be joined this year by the Discovery Educator Network, the National Wildlife Federation, the Center for Biological Diversity, and a range of panelists from a sea ice expert to polar bear scientists and a world-renowned wildlife photographer.

This year's broadcasts begin October 23 and continue through November 22. Visit www.polarbearsinternational.org to see the line-up of this year's presenters and the schedule of topics.

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Polar Bear Fact & Fiction

- Polar bears have two layers of fur: A dense, insulating undercoat topped by a layer of guard hairs.
- Polar bears are so well insulated, they can't run very far without overheating, even on cold days.
- Wet fur isn't a good insulator! That's why polar bears shake off excess water and then dry off on the snow after a swim.
- A polar bear's preferred walking speed is a casual amble: About four kilometers (2.5 miles) per hour—perfect for conserving energy.
- When covering long distances, polar bears pick up the pace to about 5.5 kilometers (3.5 miles) per hour.
- Polar bears walk across ice too thin to support a human by spreading their legs wide, starfish-style, to distribute their weight.
- Polar bears prey primarily on ringed and bearded seals, preferring the blubber most of all.
- A polar bear can eat up to 20% of its body weight in a single meal! When hunting is good, a polar bear will eat only the fat on a seal.

ADOPT A POLAR BEAR

Support PBI's mission and polar bear conservation at the same time! Our online store provides sustainable options for every occasion.

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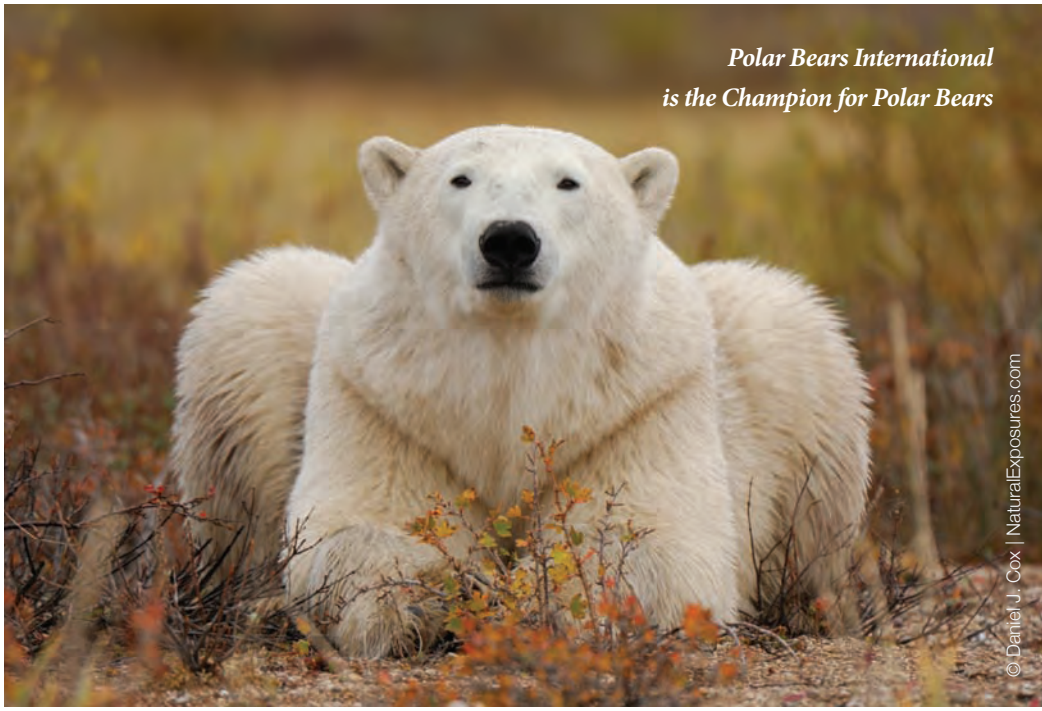

Ways You Can Help PBI

- Make an automatic monthly pledge
- Adopt a polar bear
- Shop online in our Gift Shop
- Give a gift membership
- Donate goods or services
- Tell others about PBI
- Share our posts and tweets on Facebook, Twitter, Google+, and Pinterest.

To receive our fun and informative monthly online newsletter, PBiNews, along with occasional updates, please complete the *sign-up* form on our website.

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And very special thanks to all those who support our Churchill events.

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