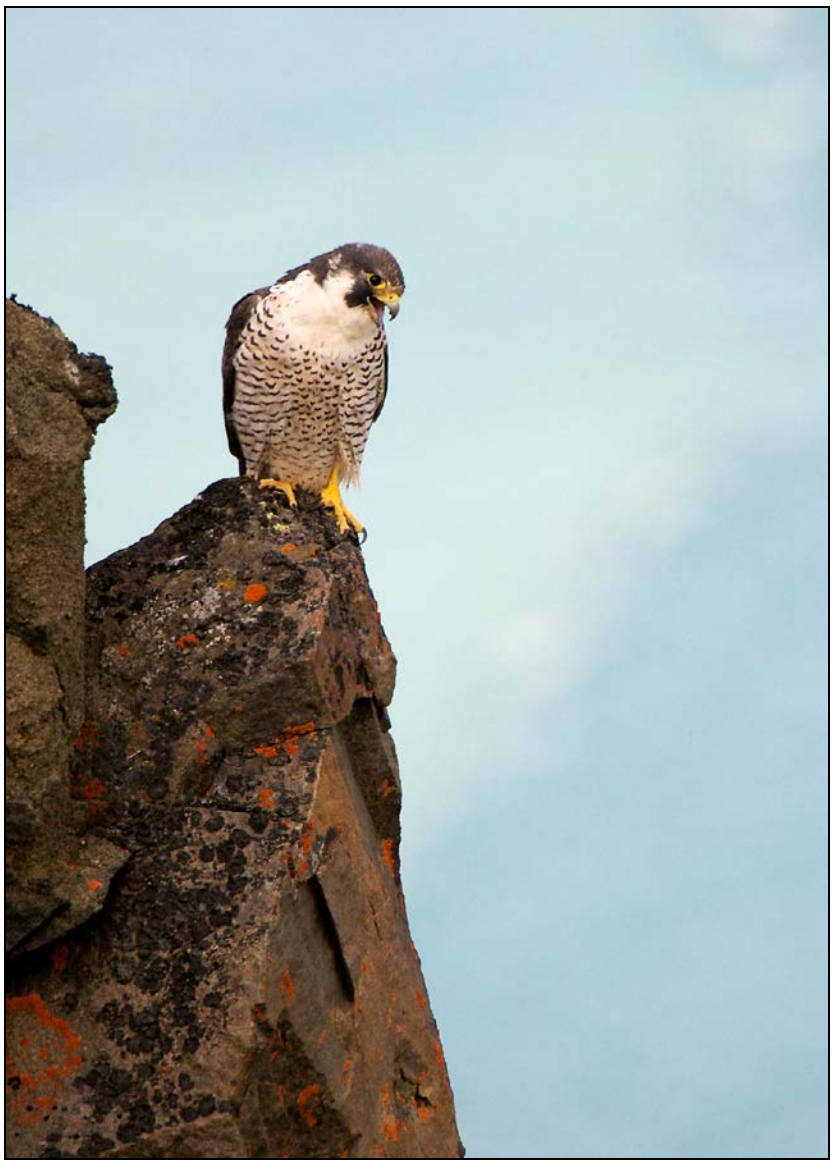
High Arctic Institute

2012 Progress Report and Update



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2012 Progress Report and Update

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Photos by: Calen Offield, Jack Stephens, Jeff Johnson, Bridger Konkel, Kurt Burnham, and Jennifer Burnham.

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Letter from the President

The 2012 field season marked the 20th anniversary of our research program in Thule. Our research has come a long way over the years, from surveying an approximate 50 km section of coastline for falcons in the early years to now covering nearly 1,000 km of coastline each summer, while working with nearly every bird species in the Thule area. Our research has produced new, original, and unexpected results and has significantly increased our overall scientific knowledge of Gyrfalcons. Our current long-term monitoring project on Peregrines and Gyrfalcons in the Thule area is one of the longest running studies on either species and is the only long-term study ever to take place in the High Arctic. Results from this study have already allowed us to show changes in breeding biology and ecology of both species, likely as a result of climate change, and these changes will only be intensified and magnified in the future. As we continue to expand out and work with other species of birds in the Thule area we have noticed additional changes, be it the large increase in the Common Eider population or the declining Arctic Tern population. As climate change continues to intensify and occur it becomes even more important that we continue collecting as much information as possible, both in an attempt to identify changes occurring at the species level, and perhaps more importantly, to gain a broad overall understanding of how changes in weather and climate are affecting the Thule area at the ecosystem level.

The biggest observed change during the 2012 field season in Thule was the dramatic increase in the number of Polar Bears we observed. From 1993 to 2011 we had never previously observed a Polar Bear in the field, despite accumulating 10,000s of km while boating and spending the equivalent of several years in the field. This past summer we observed eight different polar bears, including: one female with two cubs, one female with one cub, a large adult male, and a juvenile. Several of these bears were observed on multiple occasions, and in several instances, prevented us from walking cliffs to survey for falcons or visiting islands on foot to capture and sample seabirds. So why the sudden increase in Polar Bears? This we can only speculate on. However, it seems likely that it may be a combination of the local Greenlandic village of Moriussaq being abandoned two years ago (previously inhabited by hunters) and changes in weather and climate. Unfortunately, we will likely never know the exact reason. It will be very interesting to see if this trend continues in the future and it has already required us to be even more vigilant and well prepared when in the field. Currently, we are upgrading our flare guns and bear protection fences for 2013 to be able to better deal with any direct threats should they arise.

Outside of Polar Bears the 2012 field season in Thule was extremely successful. Early in the year rain and wind made for difficult boating and camping conditions but as the season progressed the weather improved. From our falcon surveys we found six occupied Gyrfalcon nests and seven occupied Peregrine nests, to include two new Peregrine nests. We had extremely good luck in recapturing Black-legged Kittiwakes previously tagged with geolocators in 2011, getting 17 of the 35 units back. Unfortunately, our bad luck continued with our Arctic Tern geolocator project, and the colony where we tagged the birds again failed and as a result we were unable to recapture any tagged terns. Our new Arctic Tern Nesting Survey project went well and we surveyed 17 different locations for nesting terns, finding terns at seven locations and counting an estimated 219 birds and 63 nests (of which, at least 10 failed). Of the birds and nest counted, the vast majority were at a single colony (150 birds and 51 nests), and based on the limited historical information available from the colonies in the Thule area it appears the population has greatly declined.

As always, I want to thank all of our donors for their support during 2012. Without your contributions our research and conservation projects would not be possible.

Best wishes for a great 2013!

Kurt K. Burnham, D.Phil.
President

Peregrine Falcon Monitoring Project

Goal: Conduct yearly surveys to determine what changes are occurring in the Peregrine population in northwest Greenland.

Information Collected: Location of breeding and non-breeding pairs of Peregrines, age and number of young, genetics samples, pollutant samples, molted feathers, prey remains, nest site characteristics, egg shell fragments.

Surveys for nesting Peregrine Falcons during the 2012 field season resulted in seven occupied nests being found. Of these seven nests, three were productive and produced a total of eight young. At two nests adults were extremely defensive but we were not able to climb into the nest and reproduction was unknown, while at two other nests, the pairs appeared to have failed. Of particular interest were the two new nests that were found during 2012. One nest was located in an area with several other pairs of breeding Peregrines and is most likely a result of a previously documented pair switching nesting cliffs. The second new nest is along a section of coastline where we have never previously documented breeding Peregrines. However, this area of coastline has excellent cliffs and we have surveyed it almost every year from the mid-1990s onward, always expecting to find Peregrines. Based on the long distance of this second new nest to any other Peregrine nest it is highly probable this is an entirely new breeding pair and nest. Based on our survey results it appears that the Peregrine population in the Thule area is continuing to increase as we predicted.

Table 1. Survey results for nesting Peregrines from the Thule area from 2001 to 2006 and 2008 to 2012.

	2001	2002	2003	2004	2005	2006	2008	2009	2010	2011	2012
Total known nesting locations	4	5	5	5	6	6	6	8	8	9	10
Previously known nests checked	4	4	4	5	6	5	5	8	7	8	9
Previously known nests occupied	4	4	4	5	6	5	5	7	6	5	5
New nests found	1	0	0	1	0	0	2	0	1	1	2
Total occupied nests	5	4	4	6	6	5	7	7	6	6	7

Gyrfalcon Monitoring Project

Goal: Conduct yearly surveys to determine what changes are occurring in the Gyrfalcon population in northwest Greenland.

Information Collected: Location of breeding and non-breeding pairs of Gyrfalcons, age and number of young, genetics samples, pollutant samples, molted feathers, prey remains, nest site characteristics, egg shell fragments.

During the 2012 field season we surveyed 14 previously known Gyrfalcon nest sites finding four occupied with breeding pairs of Gyrfalcons and a single nest at which a lone adult was observed (although breeding may have occurred). Additionally, for the first time in our 20 years of surveys we found a pair of Gyrfalcons nesting in an abandoned Raven's nest on the south side of Dundas Mountain. Although Gyrfalcons were reported nesting on Dundas Mountain a single time in the 1980s this is the first time both Gyrfalcons and Peregrines have been documented nesting their during the same year. Of the five nests at which Gyrfalcon produced young, a minimum of 18 chicks were produced, with all nests having at least two or more chicks and a single nest having five chicks. The total number of occupied nest sites in 2011 (6) is similar to what has been documented in the area since 2006 (Table 2). The overall increase in "total known nesting locations" is not reflective of the Gyrfalcon population increasing, but is simply a product of pairs of Gyrfalcons utilizing different nest sites throughout the survey. This also emphasizes the importance of surveying the entire coastline in our study area instead of just surveying previously known nesting sites.

Table 2. Survey results for nesting Gyrfalcons from the Thule area from 2001 to 2006 and 2008 to 2012.

	2001	2002	2003	2004	2005	2006	2008	2009	2010	2011	2012
Total known nesting locations	5	8	11	12	14	19	19	20	21	24	25
Previously known nests checked	5	8	4	10	12	16	16	16	12	15	14
Previously known nests occupied	1	5	1	7	6	6	7	6	5	6	5
New nests found	3	3	1	2	5	0	1	1	3	1	1
Total occupied nests	4	8	2	9	11	6	8	7	8	7	6

Photos: left, Inquisitive juvenile Gyrfalcon; middle, Five Gyrfalcon chicks at Cape Atholl; right, Collecting a blood sample from a Gyrfalcon chick.

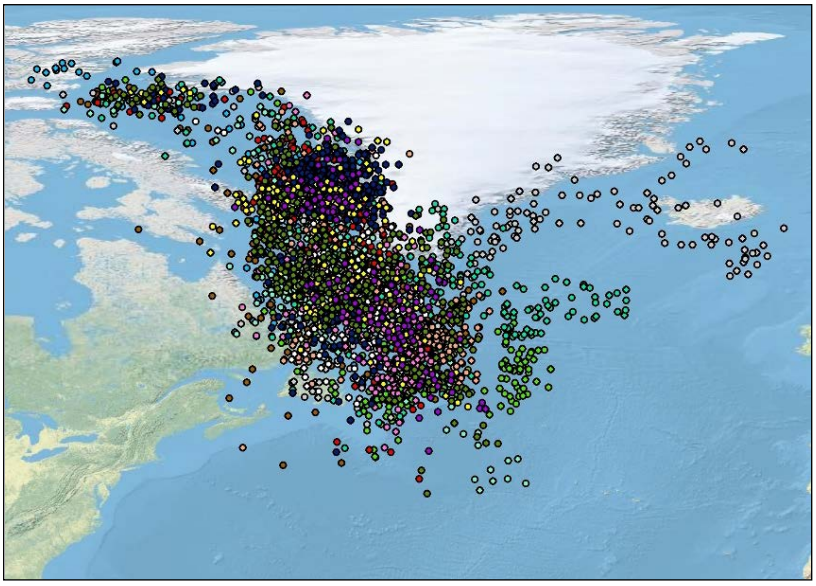
Black-legged Kittiwake Project

Goal: Determine the timing and route of migration of Black-legged Kittiwakes and how pollutant and stable isotope levels vary by wintering area.
Information Collected: Seasonal movements using geolocators, blood and feather samples.

In 2011 we began a new project tagging Black-legged Kittiwakes with geolocators on Saunder's Island. Not only is this colony one of the largest in Greenland, with an estimated 5,000 pairs, but it is also one of the most northern in the world. No information is known on the seasonal movements of this population, and data from the geolocators will provide us with the first-ever knowledge of their wintering locations and timing of migration. A total of 35 geolocators were put on adults at the colony during 2011. During 2012 we revisited the colony and successfully recaptured 17 individuals, with no other tagged individuals observed. Preliminary results show that Black-legged Kittiwakes from the Thule area spend the winter in the area between southern Greenland and Newfoundland, with some individuals wintering around Iceland and southeast Greenland. Results from this study will help to identify critical wintering areas for this population.





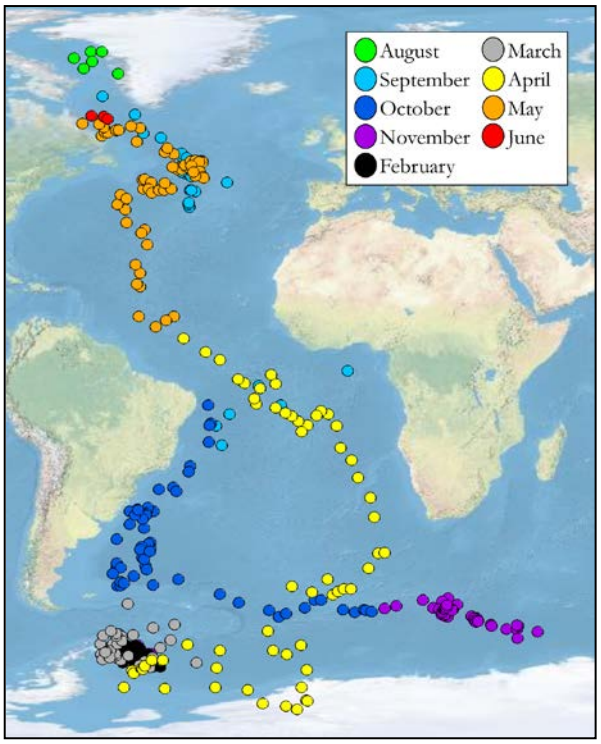


Photos: top left, Black-legged Kittiwakes tagged with geolocators standing on their nests; top center, Black-legged Kittiwake with geolocator; top right, Downloading data from a geolocator while in the field; bottom left, After several weeks of hard work we finally captured the last tagged Black-legged Kittiwake; bottom right, Preliminary results from the 17 Black-legged Kittiwakes tagged with geolocators. Each color represents and individual bird with two locations (sunrise/sunset) for each day.

Arctic Tern Migration Project

Goal: Determine the timing and route of migration.

Information Collected: Seasonal movements using geolocators.



Begun in 2010, 23 adult Arctic Terns were tagged with geolocators to determine the timing and route of migration. Previous research done in East Greenland by Egevang *et al.* (2010) showed Arctic Terns have the longest migration of any species on the planet. Unfortunately, during both 2011 and 2012 Arctic Tern reproduction throughout northwest Greenland was significantly reduced. In particular, at the small colony where we chose to conduct our study only a few nests were found in 2011. In 2012 reproduction was even worse, and tern eggs were predated almost as soon as they were laid and no reproduction occurred. We did observe a few individuals tagged with geolocators in 2012 and we will again visit the colony in 2013 in an attempt to recapture any tagged adults that are nesting. The map on the right is from the single adult recaptured in 2011.

Peregrine Falcon Migration Project

Goal: Determine timing and route of migration of Peregrines from northwest Greenland and compare with other Arctic nesting Peregrine populations.

Information Collected: Seasonal movements using geolocators.

Over the past 15 years multiple studies have focused on the seasonal movements of Peregrine Falcons breeding throughout its Arctic range in the Western Hemisphere. However, these studies have all been independent of one another and have not been focused over a specific time period. Starting this past summer we began a coordinated study to look at the migration patterns and strategies of Peregrine throughout their entire Arctic range in the Western Hemisphere. This research is in cooperation with scientists in southern Greenland, Canada, and Alaska and entails tagging adult female Peregrines at the nest with geolocators. In northwest Greenland we were only able to tag two adult females with geolocators this past summer but our hope will be to tag additional females in 2013 (in addition to removing the removing and replacing the geolocators we put on females in 2012). Depending upon funding, we may expand this project to the south into the Kangerlussuaq area in central-west Greenland in either 2013 or 2014. The Kangerlussuaq area has numerous pairs of Peregrines which nest in at a very high density when compared to the Thule area. This would make the area ideal as we could tag a large number of birds in a relatively short period of time.

Arctic Tern Nesting Survey

Goal: Conduct the first ever Arctic Tern nesting survey in northwest Greenland to determine their population status.

Information Collected: Locations of breeding colonies, number of pairs, individuals, or nests observed, data on nesting chronology.

Arctic Terns breed throughout Greenland, with the largest concentration occurring in West Greenland between ~68° to 74° N. Recent indications are that the population is declining, and in 2007 Arctic Terns were categorized as "near threatened" and added to the regional Red List for Greenland. Northwest Greenland is home to some of the most northern Arctic Tern colonies in the world. Here Arctic Terns have been documented breeding at 17 locations. Of these locations, none have been systematically surveyed, with the majority documented by aircraft and only six ever visited by researchers on foot. Based on crude estimates, the population likely ranges from 250 to 500 pairs, although many locations have only been visited once (by plane) and the most recent information available is for a few islands from the late 1990s, with many islands not visited since the late 1980s. Based on anecdotal data we have collected during our surveys for Gyrfalcons, Peregrine Falcons, and other species from 1993 onward, it appears that a number of islands observed with nesting Arctic Terns as recently as 10 years ago, are now vacant. Based on both the lack of survey data and the apparent decline of Arctic Terns in Greenland, collecting systematic baseline information on the population is critical. Furthermore, by collecting data from colonies along the northern periphery of the Arctic Tern's breeding range, such as northwest Greenland, we might expect to see climate-related changes sooner than in colonies further south. During 2012 we surveyed 17 locations (10 previously known colonies) that had suitable nesting habitat for Arctic Terns. Of these 17, seven had Arctic Terns present and five had nests. A total of 219 adults were counted, with well over half (150) at a single colony and no more than 30 birds observed at any other colony. Of the five colonies with nests, one colony had 51 nests, two colonies had five nests, and two colonies had a single nest. Both of the colonies with five nests were surveyed again later in the season and all the nests at both colonies had been predated. Of those two colonies, one was visited on five different occasions, and observed from a distance on other days, and it appeared that Arctic Tern nests were being predated within one to two days of egg laying. Unfortunately, due to bad weather we were unable to survey nests beyond 77.40° N but in 2013 we plan to do the entire survey again and hope to include the colonies to the north. Based on our 2012 survey, it appears extremely likely that the Arctic Tern population in northwest Greenland has significantly declined over the past 10-20 years and additional monitoring is needed, and planned, in future summers.

Table 3. Results of Arctic Tern survey from 76.00° N to 79.10° N.

Total known colonies	Known colonies surveyed	Known colonies occupied	Known colonies with nests	Vacant colonies	New colonies found	New colonies with nests	Total nests all colonies	Total terns all colonies
18	10	5	5[1]	5	2	0	63[1]	219

[1]All nests at two colonies were later found to have been predated (10), two colonies had single nests, and one colony had 51 nests.

Methyl Mercury and Stable Isotope Project

Goals: Conduct the first ever large scale trophic level study on birds in the Thule to identify potential relationships between feeding biology and ecology, pollutants levels, and colony location.

Information Collected: Blood and feather samples from all bird species found in the Thule area. When possible, samples have been collected from multiple colonies to allow for spatial comparisons to be made.

The 2012 field season marked the third year of a new project studying the methyl mercury (MeHg) levels of bird species found throughout the Thule area and how these levels vary by trophic position (established using stable isotopes). While this type of research has been done in many other areas in the Arctic this is the first in depth research done in northwest Greenland or the High Arctic. To date, we have collected over 700 samples from 27 different species with the majority of these samples having already been analyzed for both methyl mercury and stable isotopes. Data analyzes is currently underway and we hope to submit several papers for publication during 2013.

Education Program

Goals: Provide undergraduates an opportunity to participate in our field research.

Continuing our partnership with Augustana College in Rock Island, Illinois, during the 2012 field season senior to be Claire Behnke spent six and a half weeks in Thule helping with all facets of our field research. Claire is currently a pre-vet major and particularly enjoyed having an opportunity to learn to handle and work with the wide variety of bird species we encounter. Now back at Augustana College, Claire is heavily involved with analyzing the data from our Black-legged Kittiwake Migration Project and while at the same time trying to figure out how she can combine her interest in being a veterinarian with field research.

Photo to right: Claire with Gyrfalcon chick.

Kangerlussuaq Peregrine Falcon Survey

Goals: Provide undergraduates an opportunity to participate in our field research.

In Kangerlussuaq, in central-west Greenland, Dr. Robert Rosenfield and his students from the University of Wisconsin Stevens Point surveyed for nesting Peregrine Falcons from 25 July through 3 August. In total, his team visited 15 Peregrine cliffs and found pairs of Peregrines with young at eight of the cliffs. Research on falcons in this area first started in 1972 with annual surveys for Peregrines and Gyrfalcons continuing through 2006. Since 2006, no active falcon research has occurred in Kangerlussuaq and Dr. Rosenfield and his team of students has played a crucial role in continuing to help collect important data on cliff occupancy and reproduction. By continuing to monitor and collect data on this population we hope to be able to detect changes in the number nesting cliffs occupied annually, reproduction, and nesting chronology.

Photo to right: Dr. Robert Rosenfield and his class from the University of Wisconsin Stevens Point. Students included Ryan Askren, Bree Bender, Jenna Cava, Brandyn Kerscher, Amanda Reininger, Andy Richardson, and Jeremiah Snortum. Additional assistance in the field was provided by Dr. Travis Booms (also pictured)

News from 2012:

The High Arctic Institute now on Facebook

In late June of this year we created a Facebook page so we could share our field experiences and photos with our supporters and members. The page proved to be a big success, and we had numerous people following us throughout the field season. During the offseason be sure to look for updates on data analysis, new publications, and other new information. Like us on Facebook at www.facebook.com/HighArcticInstitute

The High Arctic Institute Webpage

In early 2012 the High Arctic Institute's new webpage went live. The webpage offers copies of all Progress Reports and scientific papers for download, in depth information on research projects and the organization, and 100s of amazing photos from the Thule area broken down by topic. During spring 2013 look for additional changes to the webpage and many new photos.

Looking for Collaborators

Over the past six years the High Arctic Institute has greatly expanded its research focus in Thule while beginning a number of new projects. Several of these projects, specifically the Avian Influenza Project (2009 and 2010) and the Methyl Mercury/Stable Isotope Project (2010 – current), involved capturing and sampling large numbers of as many bird species as possible. While samples were taken for these specific studies, we also collected genetics samples and biometric measurements of all birds handled. We also have collected egg shell fragments for a number of species that will be used for an upcoming project on contaminants. If you or anyone you know might have interest in collaborating with us, please have them contact us.

Publications from 2012

Two thousand twelve marked yet again another great year for publications from the High Arctic Institute. During the past year our researchers were the primary author or co-author on four manuscripts that were submitted to peer-reviewed scientific journals for publication. As of this writing, two have been published, one is available on-line early, and one is in press. Of particular great news is that the long awaited monograph on our Peregrine research in northwest Greenland has finally been published. The monograph, titled "The History and Range Expansion of Peregrine Falcons in the Thule Area, Northwest Greenland", has been awaiting publication for several years and finally, with the financial support of the William A. Burnham Memorial Fund of The Peregrine Fund, the monograph has been printed and is now available. Additionally, an extremely interesting paper on the effects of plumage color on timing of breeding and offspring number has been published from our research on Gyrfalcons in central-west Greenland. To download copies of all High Arctic Institute publications visit www.higharctic.org.

From December 2011 through November 2012 the following manuscripts were submitted to, accepted in, or published in peer-reviewed scientific journals:

Burnham, K.K., Johnson, J.A., Konkel, B.W. & Burnham, J.L. *in press*. A fourfold increase of nesting common eiders *Somateria mollissima* in northwest Greenland. *Arctic*.

Johnson, J.A. & Burnham, K.K. *in press*. Timing of breeding and offspring number covary with plumage colour among Gyrfalcons *Falco rusticolus*. *Ibis*.

Burnham, K.K., Burnham, W.A., Newton, I., Johnson, J.A. & Gosler, A. 2012. The History and Range Expansion of Peregrine Falcons in the Thule Area, Northwest Greenland. *Meddelelser om Grønland*. vol: **353**, *Bioscience*. vol: **60**: 1–106.

Johnson, J.A., Ambers, A. & Burnham, K.K. 2012. Genetics of plumage color in the gyrfalcon (*Falco rusticolus*): analysis of the melanocortin-1 receptor gene. *Heredity*. vol: **103**: 315-321.

Burnham, K.K. & Burnham, W.A. 2011. Biology and Ecology of Gyrfalcons in Greenland. In Watson, R.T., Cade, T.J., Fuller, M. & Hunt, W.G. (eds.) *Gyrfalcons and Ptarmigan in a Changing World, Volume II*: 1–20. Boise, ID: The Peregrine Fund.

Johnson, J.A. & Burnham, K.K. 2011. Population differentiation and adaptive selection on plumage color distributions in gyrfalcons. In Watson, R.T., Cade, T.J., Fuller, M. & Hunt, W.G. (eds.) *Gyrfalcons and Ptarmigan in a Changing World, Volume I*: 71–90. Boise, ID: The Peregrine Fund.

Rosenfield, R.N., Booms, T.L., Burnham, K.K., McCaffery, B.J. & Goodwin, R.J. 2011. The potential for long-term monitoring of Gyrfalcon and Peregrine Falcon breeding populations using undergraduate students; an apparent inexhaustible source of funding. In Watson, R.T., Cade, T.J., Fuller, M. & Hunt, W.G. (eds.) *Gyrfalcons and Ptarmigan in a Changing World, Volume II*: 373–384. Boise, ID: The Peregrine Fund.

Presentations at Conferences in 2012

During 2012 four presentations were made at scientific conferences that High Arctic Institute researchers were either the primary author or co-author on.

Bargmann, N.A., Burnham, K.K., Burnham, J.L., Padula, V.M., Welker, J.M. & Causey, D. 2012. Biogeochemical indicators of change in High- and Low-Arctic marine bird communities: comparative isotopic (13C, 15N, and 34S) studies in Alaska and Greenland. 39th Annual Meeting of the Pacific Seabird Group, 7–12 February, Turtle Bay, HI.

Causey, D., Bargmann, N.A., Padula, V.A., Burnham, K.K., Burnham, J.L. & Welker, J. 2012. Biogeochemical indicators of change in Arctic and Subarctic marine bird communities: Alaska and Greenland. Alaska Marine Science Symposium, 16–20 January, Anchorage, AK.

Causey, D., Bargmann, N., Burnham, K.K. & Welker, J.M. 2012. Biogeochemical indicators of change in High- and Low-Arctic marine bird communities. Annual Meeting of the Alaska Chapter of the Wildlife Society, 10–12 April, Anchorage, AK.

Johnson, J.A. & Burnham, K.K. 2012. Timing of breeding covaries with plumage color among gyrfalcons in central-west Greenland. North American Ornithological Conference, 14–18 August, Vancouver, Canada.

Goals and Plans for 2013

Publications

For 2013 the primary focus will be publication of results from previous years. We plan to submit a combination of the following manuscripts for publication in 2012: 1) a paper providing the current status of waterfowl species (excluding Common Eiders, and including several species new to the area) in the Thule area based on surveys from 2008 to 2012, 2) a paper on the increased mortality caused to Gyrfalcons by tagging them with satellite transmitters, 3) a manuscript comparing nesting chronology of Peregrines and Gyrfalcons in the Thule and Kangerlussuaq areas and what changes have occurred, 4) a paper detailing the results of our Black-legged Kittiwake geolocator and stable isotope study, 5) a manuscript on Thick-billed Murres and how diving depth influences the type of prey taken and methyl mercury concentration in their blood.

Field Research in Thule

Continuing Projects:

1) Continue monitoring and collecting data on the Gyrfalcon and Peregrine Falcon populations.
2) Retrieve geolocators placed on adult Arctic Terns in 2010.
3) Collect a limited number of samples from specific species or areas for our methyl mercury and stable isotope study.
4) Continue building our Breeding Bird Database.
5) Continue survey for Arctic Tern nesting survey.

Proposed New Projects:

1) Expand the methyl mercury and stable isotope study to include mammals (Arctic Hares and possibly Arctic Foxes) and possibly fish.
2) Tag between 2 and 4 adult Parasitic Jaegars with satellite transmitters to determine timing and routes of migration along with wintering areas.
3) Begin a small geolocator project on Red-necked Phalarope.
4) Begin a small geolocator project on Atlantic Puffins.
5) Develop a monitoring program for Common Eider colonies to count the number of nests at specific colonies, determine nesting chronology, and to determine if colonies have been predated by Polar Bears.

Acknowledgments

First and foremost we want to thank all of our donors who helped to make 2012 such a great and successful year. Special thanks to Kim Derry and Joe Hurley with Polar Field Services for helping to make our field season in Thule go so smoothly. In Thule, thanks to the United States Air Force for allowing us to travel on their planes, have access to Thule Air Base, and allowing us the use of their science support facility and other resources. Further thanks to the Danish Liaison Office at Thule Air Base for allowing us to access the base and for their friendship and support. Within the Greenland Home Rule Government thanks go to Outi Tervo for assistance with obtaining permits to conduct scientific research in Greenland. Bands/rings were provided by Kaj Kampp and the University of Copenhagen Zoological Museum and are greatly appreciated. Thank you to the United States Department of Interior, Bureau of Land Management, for their sponsorship of this research, specifically, the assistance of Virginia Hoffman who helped to arrange travel. Additional thanks to all the residents of Thule Air Base, the Danish Police Investigator, Greenland Contractors, and the Greenland Home Rule Government.

Appendix

History–Milestones Achieved in Greenland by the Greenland Peregrine Falcon Survey, The Peregrine Fund, and the High Arctic Institute:

- Bill Mattox and Bill Burnham began research on Peregrine Falcons in Greenland, later named the Greenland Peregrine Falcon Survey. (1972)
- The Peregrine Fund established a project in Thule, Greenland. (1993)
- Popular article, "Nesting Peregrines in Greenland," published in *WildBird*. (1994)
- Surveyed Cape Athol Muskoxen population. (1995–1998)
- The Peregrine Fund assumed leadership role of Greenland Peregrine Falcon Survey in Kangerlussuaq and incorporated it into The Peregrine Fund's Greenland project. (1999)
- Accomplished spring dog sled survey of 320 kilometers of coastline in Qaanaaq area (north of Thule) for Gyrfalcons, locating 12 previously used sites. (1999)
- Accomplished preliminary survey of Scoresbysund area, East Greenland, for Gyrfalcons, locating 12 occupied sites. (1999)
- Banded over 1,000 Dovekies as part of a study on adult turnover. (1995–2000)
- Completed survey of 207 out of 210 bird nesting sites in Uummannaq reported by Bertelsen in the early 1900s and documented current status. (2000)
- Popular article, "True North," published in *Living Bird*. (2000)
- Accomplished kayak survey for Gyrfalcons and Peregrine Falcons in Qaanaaq area where motor boats are prohibited, finding one occupied Gyrfalcon site and several other unoccupied sites. (2000)
- Had constructed and sailed a heavy-duty welded aluminum boat from Kangerlussuaq to Thule covering over 4,300 kilometers of ocean. (2000)
- Began study using PTTs (Platform Transmitter Terminals) to determine migration and seasonal movements of Gyrfalcons in Thule, Kangerlussuaq, and Scoresbysund areas in Greenland. (2000–2005)
- Established fall trapping station for Gyrfalcons and Peregrine Falcons in Maniitsoq. (2000 and 2002)
- Placed a total of 18 PTTs on Peregrine Falcons in Kangerlussuaq and Thule. (2001–2003)
- Popular article, "Return to Uummannaq," published in *Living Bird*. (2001)
- Conducted June helicopter surveys of Kangerlussuaq area for Gyrfalcons and Peregrine Falcons. (1999–2006)
- Surveyed from the tip of the York Peninsula north, expanding our study area into the MacCormick and Olrik Fjords. (2001–current)
- Obtained 20 blood samples from wild-taken Saker Falcons in the United Arab Emirates to do a species-level comparison with Gyrfalcons. (2004)
- Collected genetic samples from 42 Gyrfalcons in Alaska. (2004)
- Established fall trapping station at Kap Tobin in East Greenland, capturing 38 Gyrfalcons in the first year and 87 in the second, blood samples and morphometric measurements collected from all. (2004 and 2005)
- At Kap Tobin in East Greenland, captured the first-ever Peregrine, dead or alive, in east-central or northeast Greenland. (2005)
- Published paper on "Dovekie response to Glacous Gull behaviour and approach in North Greenland" in *Dansk Orn. Foren. Tidsskr.* (2005)
- Published popular article in *The Explorer's Club Journal*. (2005)
- Published paper on "Past and Present Assessments of Bird Life in Uummannaq District, West Greenland" in *Dansk Orn. Foren. Tidsskr.* (2005)
- Received substantial press coverage in Denmark via internet, newspapers, radio, and television of the results presented in our paper on "Past and Present Assessments of Bird Life in Uummannaq District, West Greenland." (2006)
- Published paper on "Genetic structure among continental and island populations of gyrfalcons" in the journal *Molecular Ecology*. (2007)

- Completed analyses on weather data collected at Thule Air Base from 1979 to 2005, showing a general warming trend for the area. (2006)
- Created the High Arctic Institute in the fall of 2007 and took over all projects and research previously done in Greenland by the Greenland Peregrine Falcon Survey and The Peregrine Fund. (2007)
- Kurt Burnham completed his D.Phil. at the University of Oxford, titled "Inter- and intraspecific variation of breeding biology, movements, and genotype in Peregrine Falcon *Falco peregrinus* and Gyrfalcon *F. rusticolus* populations in Greenland." (2008)
- High Arctic Institute conducted its first field season in Greenland. (2008)
- Conducted first-ever ornithological survey of the Carey Islands, Northwest Greenland. (2008)
- Began monitoring project of avian species inside Thule Air Base defense area. (2008–current)
- Systematically surveyed the Thule area for nesting common eiders, counting 20,687 nests and estimating the population in Thule to be from 25,000 to 30,000 pairs. (2009)
- Began project in cooperation with the United States Geological Survey sampling bird species in the Thule area for the AI virus. (2009 and 2010)
- Tagged 23 adult Arctic Terns with geolocators. (2010)
- Began study on methyl mercury and stable isotopes, collecting over 600 samples in 2010 and 2011. (2010–current)
- Tagged 35 adult Black-legged Kittiwakes with geolocators. (2011)

List of publications from research and data collected in Greenland by the Greenland Peregrine Falcon Survey, The Peregrine Fund, and the High Arctic Institute; includes papers in peer-reviewed scientific journals, books, and dissertations:

Peer-reviewed papers:

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Gould, W.R. & Fuller, M.R. 1995. Survival and population size estimation in raptor studies: a comparison of two methods. *Journal of Raptor Research*. vol: **29(4)**: 256-264.

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