



## 2002 LITTLE AUK EXPEDITION TO SPITSBERGEN

What do Soviet-era amphibious vehicles, fish landing nets, manicure tools, Polish cuisine, Norwegian helicopters and freighters, surplus rifles from the Third Reich, binoculars and sample bags all have in common? No, they're not the stuff of a paperback action novel - they were all essential components of the 2002 Little Auk expedition to Hornsund, Spitsbergen. With generous support from a Seabird Group grant, we travelled to Hornsund in July and August 2002 to work on the breeding, feeding, and behavioural ecology of Little Auks (*Alle alle*).



Little Auk (*Alle alle*) with zooplankton-filled throat pouch (Photo © Tom Van Pelt)

We sampled chick diets directly, adult diets indirectly, and also measured a range of feeding ecology parameters to be merged with an ongoing study of Little Auk foraging ecology.

Additional field work focused on sex differences in parental behaviour and provisioning during the chick rearing and fledging periods. The expedition was based at the Polish Polar Station in Hornsund, Spitsbergen, in the archipelago of Svalbard.

The first international Little Auk Expedition to Hornsund took place in 2001, with a multinational team (Nina Karnovsky, USA; Fridtjof Mehlum, Norway; Lech Illiszko, Poland; Ann Harding, UK) led by Jan Marcin Węślawski from the Institute of Oceanology, Polish Academy of Sciences (PAS). The primary aim of that expedition was to examine how the foraging behaviour of Little Auks is influenced by heterogeneous water masses surrounding the colony. Given that plankton populations closely track changes in ocean temperatures, plankton-feeding Little Auk populations are likely to be affected by changing climate and ocean currents.

The Atlantic section of the Arctic is currently undergoing large-scale changes in the distribution of water masses, and Little Auks may be forced to forage in areas with sub-optimal conditions if the pattern of Atlantic and Arctic water flow shifts. The colony at Hornsund is adjacent to an important confluence of Atlantic and Arctic Ocean currents, and therefore presents an ideal situation to investigate Little Auk feeding ecology and foraging activity in the context of variable oceanographic conditions.

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The 2001 work was very successful, and the study was planned to continue for at least another year. However, most of the 2001 participants were unable to make a return trip in 2002, and the funding situation was looking grim. But Ann Harding was very keen to return for a follow-up year of study, and by the late spring of 2002, the PAS Institute of Oceanology was able to commit to providing food, lodging, and fundamental logistical support to Ann and to Tom Van Pelt, and the same Institute arranged for Magda Owczarek to come to the station as a volunteer worker. Small grants from the Gino Watkins Memorial Fund, the Augustine Courtauld Trust, and Alaska Pacific University nudged us closer to financial viability, and when the news came of a grant from the Seabird Group, the dark clouds of funding shortfalls had finally cleared. Now all we had to do was get our gear and ourselves to Hornsund in time for the Little Auk breeding season.

The Svalbard archipelago is probably the world's most easily accessed High-arctic area, with the Longyearbyen airport (78°15'N) served by daily scheduled jet flights from mainland Norway. However, unless you've planned (and paid) to be aboard one of the many luxurious eco-tour vessels based out of Longyearbyen, the ease of travel takes a steep nose-dive once you've exited your Norwegian airliner. During the ice-free summer, reaching Hornsund requires a full day's passage down the exposed waters of the west coast of Spitsbergen. The three members of our team solved this transport problem differently: Magda, arriving first, came aboard a Polish Maritime Academy training ship (*M/V Horyzont*) that makes three annual resupply voyages to Hornsund from Gdansk, Poland. Ann, our team leader, arrived next; the Norwegian Polar Institute offered Ann transport from Longyearbyen aboard their R/V *Lance*, and ferried her to shore in spectacular fashion via their shipboard helicopter. Tom, arriving last in mid-July, was generously given a berth aboard the PAS R/V *Oceania* as it worked its way down the western coast from Longyearbyen to begin oceanographic work in Hornsund Fjord.

With the team safely assembled, fieldwork began in earnest, focusing on the Little Auk colony at Ariekammen (77°03'N, 15°10'E), 1 km north of the Polish Polar Station. The breeding season was a little earlier than average, but Ann

and Magda were ready to begin working during the end of the incubation period. Initial work focused on locating and signposting nest sites, marking individuals with metal and colour rings, and collecting blood samples from family groups for molecular sex identification and analysis of extra-pair paternity rates.

Our chief priority in collaboration with the PAS was to collect chick diet samples from breeding Little Auk adults during the early chick-rearing period, concurrent with work by the PAS Institute of Oceanology in the fjord and surrounding waters to characterize the marine habitat and the distribution and abundance of the zooplankton that the Little Auks prey upon. Thus, while the R/V *Oceania* and its full crew of planktonologists, oceanographers, benthic ecologists, and chemists worked throughout the 24-hour polar days doing zooplankton net tows, CTD casts, SCUBA work, and hydroacoustic surveys, we had a crash course in capturing adult Little Auks.



**Little Auk caught in mistnet with zooplankton chick meal in its throat**  
(Photo © Ann Harding)

Our initial approach was to use a mist net strung perpendicular to the slope, catching flying birds returning to their talus nest crevices with food for their chick in a distensible pouch beneath their tongues. With the bird in hand, complete chick meals were gently scooped out of the pouch using one of a range of manicure tools that we'd brought along for this purpose (birds were released unharmed within ca. 5 minutes of capture, and were handled under permit from Norwegian authorities). The mist-net method was productive, but involved some very long waits between captures, and more than a few hectic mass-nettings of Little Auks spooked off

the colony by a patrolling Glaucous Gull (*Larus hyperboreus*).

So, employing a small fish-landing net with an extended handle, we began to stalk and capture individual Little Auks posturing on the colony with full throat pouches. After some comical misses and much trial-and-error, the hand-net became our tool of choice, allowing more rapid and predictable captures. By the time the workers aboard the *Oceania* had completed their work and prepared to leave, we'd achieved our target sample size of chick diet samples to be analysed in relation to the data collected aboard ship. We handed the samples over to the Polish research team for transport and later analysis back in Poland (Institute of Oceanology, J.M. Węśławski principal investigator).



**The collection of a zooplankton chick meal from the throat pouch of a Little Auk**  
(Photo © Tom Van Pelt)

We carried out two more capture sessions during the middle and late chick rearing periods, ending up with a total of over 80 chick diet samples. To learn more about seasonal changes in both chick and adult diets, we also collected blood samples from chicks and adults during each of the three capture sessions for later stable isotope analysis. We randomly selected chick diet samples from each capture phase for stable isotope analysis, and workers aboard the R/V *Oceania* (Kasia Dmoch and Wojtek Walkusz) collected voucher specimens of all key zooplankton prey types, providing benchmark values to strengthen interpretation of the stable isotope analyses. We're collaborating with Dr Keith Hobson (Canadian Wildlife Service) in this aspect of the study and all samples are currently being analysed in his lab.

The next priority was to continue the behavioural work, focusing on sex differences in parental provisioning and time spent at the colony. Ann and Magda had found 15 accessible nests with visible entrances during the end of the incubation period, captured and individually identified both parents from each of those nest-sites, and taken a small blood sample from each parent for molecular sex identification.

The low density of nest sites with both accessible adults and clearly visible entrances forced them to split the 15 nests into two groups, requiring a team of two people to observe all nests simultaneously. Because we wanted to learn more about seasonal changes in behaviour between the sexes, we planned to conduct 24-hour watches during early, middle, and late chick rearing. The early chick-rearing phase was happening before Tom arrived ... so Ann and Magda did the first watch with no relief, making for a very long 24 hours. Luckily some of the staff at the Polish station kindly brought hot soup, tea, and some massive down overpants and jackets to fight the arctic chill. The second and third watches were made much less stressful by the addition of a third person, allowing the team to rotate observations and rest time in a tent set-up near the colony, so that two people were always observing while one rested. In addition to the three 24-hour watches, we also conducted four night watches during the peak diurnal fledging period (between 2200-0200).

We three must have made quite a sight for the bemused Polish staff as we trudged up to the colony, loaded down with tent, layers of warm clothes, thermoses, binoculars and home-made chairs, all topped off with a heavy 1939 vintage rifle. Polar bears are regular summertime visitors to the area around the Polish station, and all workers there are required to be armed whenever they leave the station. For some unknown reason, the rifles for hire at every outfitting shop in Longyearbyen were all alike; antique but reliable Mausers, surplus from the Second World War. We also carried flare guns as non-lethal deterrents. Needless to say, we did a lot of looking over our shoulders while we tried to focus on the bird work at hand. Although we did have two unforgettable encounters away from the station, we were grateful to never see a bear in the vicinity of our study colony.

Male and female roles during the chick-rearing period are aspects of Little Auk behaviour that have so far eluded a thorough understanding. Like other semi-precocial Alcid species, Little

Auk chicks are fed at the nest until they've reached at least 65% of adult size. However, while chicks of other semi-precocial alcid species are completely independent from their parents after fledging, Little Auk fledglings are accompanied to the sea by one parent. Limited past data from parent-chick pairs shot at sea have indicated that the parents accompanying Little Auk chicks are males (as with the closely related Razorbill and guillemots [*Alca torda* and *Uria* spp.], but this has never been confirmed with observations at the colony. More importantly, a detailed observational study of parental behaviour during the chick rearing and fledging periods has never been carried out, in part due to difficulties in sexing these birds in the field. With collaboration by Prof. Jan Lifjeld and Dr Fridtjof Mehlum (Zoological Museum, University of Oslo), all our individually marked birds used for behavioural observations were later sexed in Lifjeld's lab using molecular techniques, allowing us to examine differences in male-female parental care (results soon to be submitted for publication, Harding *et al.*).



Little Auks in flight above Arikammen, Hornsund, with Hansbreen and Fannytoppen in the background (Photo © Tom Van Pelt)

## A SUMMARY OF BLACK GUILLEMOT BREEDING AT BANGOR, NORTHERN IRELAND IN 2002

The fledging period was a blur of frantic activity - chicks madly exercising their wings outside their nests, parents nervously eyeballing the patrolling Glaucous Gulls, and parent and chick pairs performing aerial acrobatics in eluding chasing gulls. By the end of August, most of the fledglings had gone and the colony was eerily quiet. Our work was winding down. Groups of plump Purple Sandpipers (*Calidris maritima*) were staging along the beaches, Barnacle Goose (*Branta leucopsis*) chicks were nearly adult size, and flights of Barnacle and Pink-footed Geese (*Anser brachyrhynchus*) were passing overhead. The tundra was painted in gorgeous shades of reds and yellows, and we could feel a distinct chill in the air at the summer sun's first dip below the horizon. It was time for us to leave.

We'd made arrangements to be picked up by a Norwegian container ship running between Tromsø and Longyearbyen. A few days were spent waiting for word ... finally one night at 01:00, the station's radio crackled to life with notice that we were to be in the water ready for pickup at 03:00. The station has no pier; all supplies are brought on land using a 1950's-era Soviet-surplus tracked amphibious vehicle. Ceremonial departures are accomplished the same way, in fine style. Bobbing in the dark ocean, we sat waiting, as the cargo freighter's bright red hull loomed towards us in the grey light. The friends we'd made at the Polish station waved goodbye as the all-Russian crew hoisted us aboard the ship *Norbjorn*. A big Atlantic swell quartered against our stern as we exited the fjord mouth and turned north towards Longyearbyen.

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Black Guillemots (*Cepphus grylle*) have nested in the harbour wall at Bangor, Co. Down, Northern Ireland since 1911. In the late 1980's, a marina was built in Bangor Bay and now there are over 50 nesting holes in the three piers of the marina, many of which have been purpose-built for Black Guillemot nesting (Greenwood 1998). I began monitoring breeding in 1985 and now have 18 years of breeding data. This report therefore updates the 1998 paper that summarised 13 years of monitoring. There are 15 nesting holes in the North Pier, which was the pier first used by the birds back in 1911. There are a further six holes in the South Pier: the pier that is the main access on to the marina pontoons. The Central Pier has the largest number of nesting holes with 27 purpose-built concrete boxes beneath it. There are three further chambers on the outer face of the Central Pier. Black Guillemots are opportunistic and occasionally use other odd holes and crevices associated with manholes and service ducts.

The number of pairs of Black Guillemots attempting to breed in 2002 was 29; a little less than in 2001, although the upward trend of breeding attempts is apparent (Fig. 1). The North Pier had 12 pairs, the Central Pier 14 pairs and the South Pier 3 pairs.

The number of young fledged in 2002 was 25 – a substantial reduction compared with previous years. The traditional site on the North Pier produced 17 fledged young, whilst the Central and South Piers produced four fledged young each.

Not surprisingly, the number of young fledged per pair also varied between the three piers in 2002 (Fig. 2). The North Pier was the most successful with 1.42 young fledged per pair, whilst the Central Pier was the least successful with only 0.29 young fledged per pair. Older, more experienced birds use the North Pier, whilst the South and Central Piers attract the younger, less experienced birds. In addition, the Central Pier is more prone to disturbance than the other two piers.