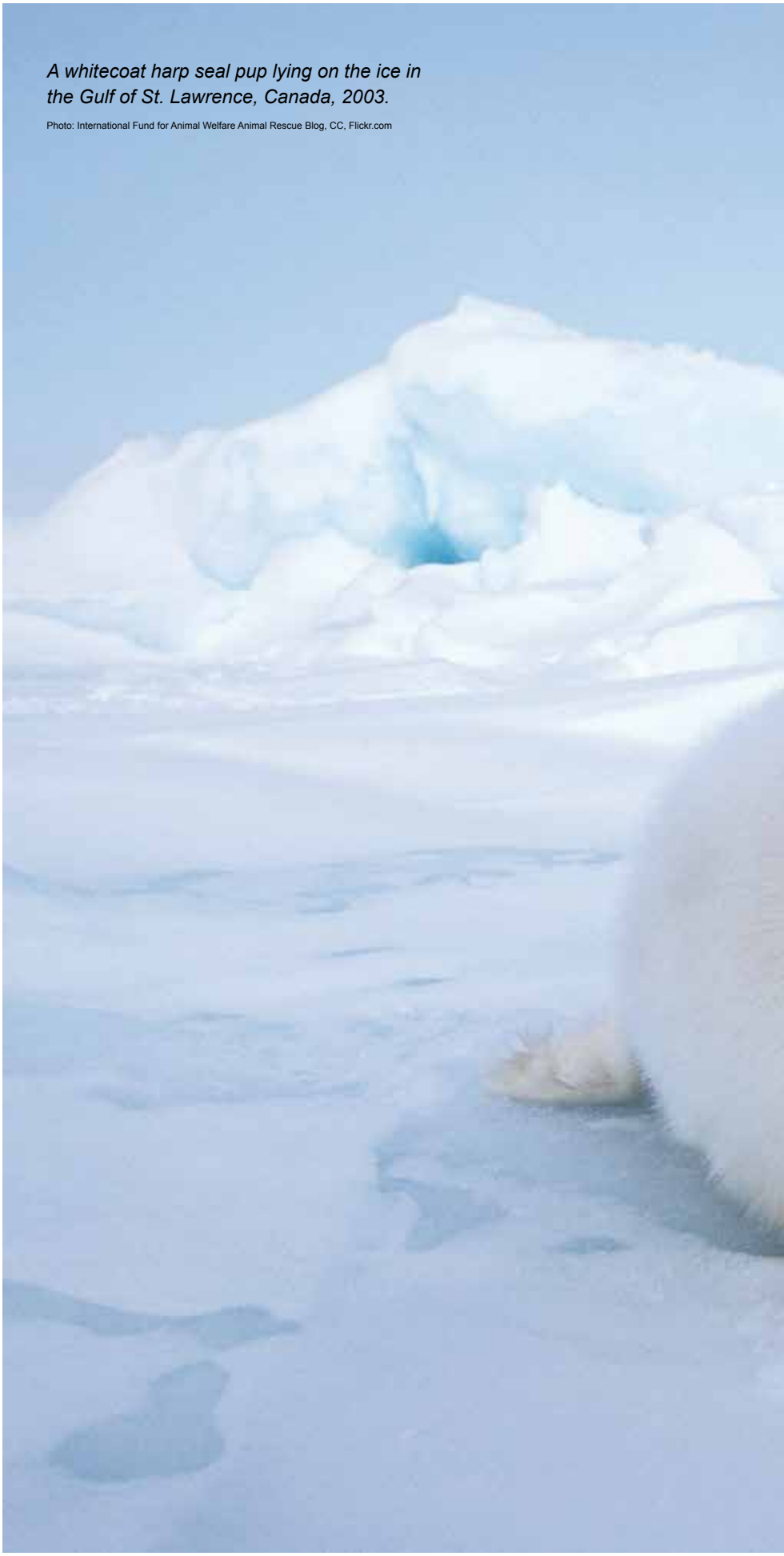
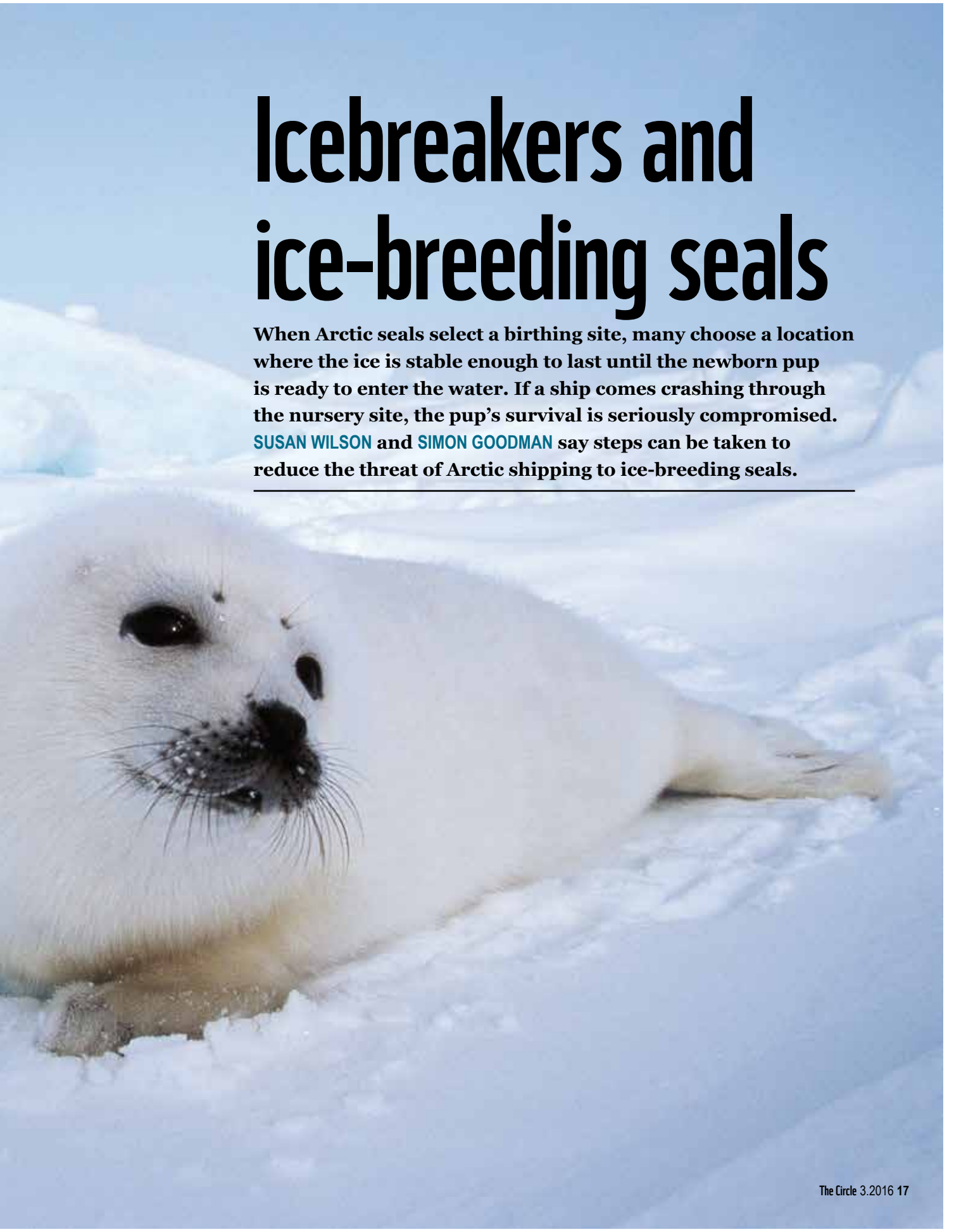


A whitecoat harp seal pup lying on the ice in the Gulf of St. Lawrence, Canada, 2003.

Photo: International Fund for Animal Welfare Animal Rescue Blog, CC, Flickr.com

Icebreakers and ice-breeding seals

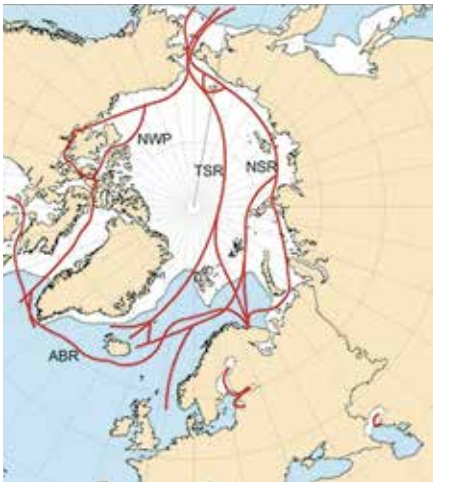
When Arctic seals select a birthing site, many choose a location where the ice is stable enough to last until the newborn pup is ready to enter the water. If a ship comes crashing through the nursery site, the pup's survival is seriously compromised. SUSAN WILSON and SIMON GOODMAN say steps can be taken to reduce the threat of Arctic shipping to ice-breeding seals.



Overlap between pinniped species ranges and main Arctic and sub-Arctic shipping routes

Species	Overlap with shipping route					
	NWP[1]	NSR[2]	TSR[3]	ABR[4]	Baltic	Caspian
Harp seal	X	X	X	X		
Ringed seal	X	X	X	X	X	
Bearded seal	X	X	X	X		
Hooded seal	X		X	X		
Walrus	X	X	X	X		
Ribbon seal		X				
Largha seal		X				
Harbour seal		X				
Grey seal		X			X	
Caspian seal						X

1. Northwest Passage. 2. Northern Sea Route. 3. Transpolar Sea Route. 4. Arctic Bridge Route.



Map showing principal northern shipping routes where ice-breaking vessels and seals are likely to overlap.

THE RANGES OF TEN SPECIES of ice-breeding pinnipeds (seals and walruses) are overlapped by principal shipping routes in the Arctic as well as in the Baltic and Caspian seas. In addition, localised shipping, in areas such as in the Russian White, Pechora, N. Okhotsk and Kara seas, also traverses the breeding range of some species. When ships plough through breeding sites, mothers usually try to escape with their pups across the ice. Those that can't are often crushed; those that can are displaced from the nursery site, and pup and mother can become separated. Even if a mother does manage to lead her pup to comparative safety, the stress and energy loss to both is considerable.

SUSAN WILSON is director of Tara Seal Research, chair of the Seal Conservation Society & co-director of Seal Conservation Solutions

SIMON GOODMAN'S research focuses on marine mammals, conservation biology, disease ecology and population genetics.

Mammal scientists began raising concerns over the effects of Arctic shipping on breeding and birthing sites in the early 1980s. Increases in oil and mineral extraction, bigger and more powerful vessels along with new shipping routes for transportation of goods facilitated by a warmer Arctic allowing ever-increasing shipping traffic have only increased these threats. But the devastation of pinniped herds can be avoided.

The first step is for international shipping regulators to have seasonal breeding seal distribution maps for all shipping routes, thus avoiding the most vulnerable seal ice. Such mapping will require updated aerial surveys and possibly also satellite imaging. This can help identify locations and time periods of elevated risk of shipping on seals. Regulators and shipping operators could then decide to reduce traffic in those areas at sensitive times, or develop codes of practice for responsive mitigation measures when transiting through them.

THE DEVASTATION OF PINNIPED HERDS CAN BE AVOIDED

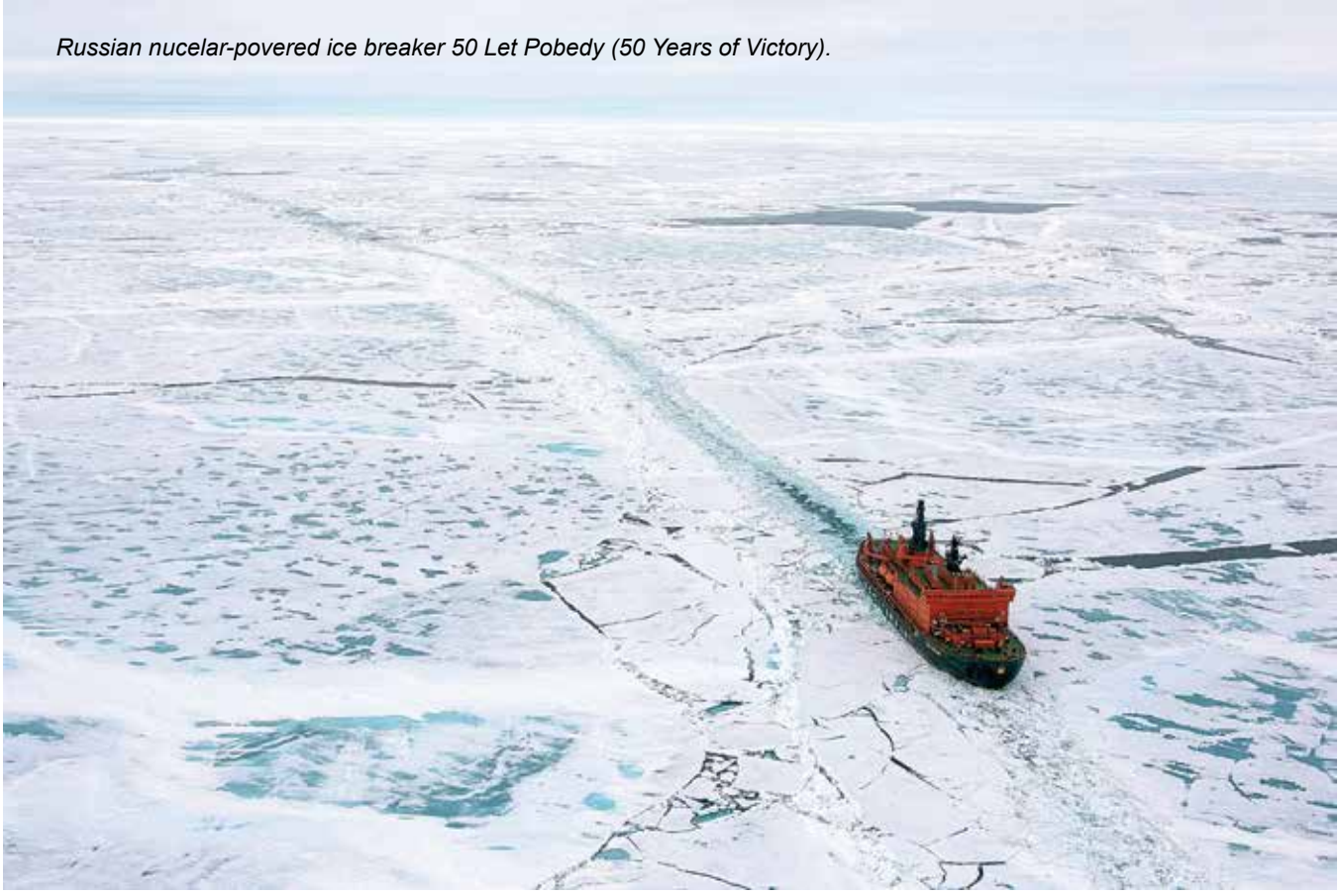
Vessel captains and crews also need to develop awareness and assume responsibility for ensuring their ships do not penetrate seal areas and especially do not cause disturbance to mothers and young. This will require a communication network between seal survey teams, contract company management, shipping logistics control and vessel captains. Safe ship-seal distances are already known for some species – for example 500m for harbour seals on ice floes in Alaska, 600–800m for walruses in Alaska and 150–200m for Caspian seals, although safe distances for most species still need to be determined. Ultimately it is the vessel Captain's responsibility to ensure that safe distances between ship and seals on ice are maintained at all times. It is possible that modern drone technology will facilitate surveying vessel paths in potential seal areas. Avoidance of ringed seals during

the breeding season is an exceptionally difficult challenge, because these seals are not only widely dispersed (up to 2 seals per km²) but are mostly invisible in the water beneath the ice and with pups in snow-covered lairs which are invisible from the surface. It is possible that modern defence-grade infrared technology may be used to detect lairs ahead of vessels, either from drones or from high points on the vessel.

All ships known to be traversing potential seal ice should carry specially trained seal observers who will identify seals on ice at a distance and advise the captain accordingly. They would also record species and location, presence of young, distance from the vessel, vessel speed, vessel/seal encounters less than the designated safe distance for each species, and report back to contracting companies and any regulatory authorities. This would provide quantitative information to help assess potential impacts and refine mitigation measures and operating procedures.

AVOIDANCE OF RINGED SEALS DURING THE BREEDING SEASON IS AN EXCEPTIONALLY DIFFICULT CHALLENGE

Legal frameworks for protecting pinnipeds from international shipping are currently poorly defined or absent. The U.S. Marine Mammal Protection Act protects seals in US waters, and designates a statutory safe distance between ships and walruses. Framework protection exists in Norway for all seals and walruses, in Russian waters for the Baltic ringed seal and grey seals, and in Kazakhstan for the Caspian seal, but regulatory protocols and practical implementation outside the U.S. have yet to be developed. The International Maritime Organization (IMO) Polar Code includes a code for marine mammal avoidance to minimise the risk of ship strikes with cetaceans, which could be developed to also apply to pinnipeds on ice. The Arctic Council's Protection of the Arctic Marine Environment recommends working on this with IMO, while the Conservation of Arctic Flora and Fauna recommends flexible and adaptable wildlife and habitat management and marine spatial planning. Thus far, therefore, we are seeing only good intentions directed towards marine mammals in general, mainly cetaceans in open waters, and not yet targeting the protection of seals on ice. ○



Russian nucelar-povered ice breaker 50 Let Pobedy (50 Years of Victory).

Photo: Christopher Michel, CC, Flickr.com