BRETT K. SANDERCOCK
(Norwegian Institute for Nature Research, Norway)



Estimation of seasonal survivorship for migratory animals in a changing world

Migratory animals travel long distances to track seasonal pulses of resources, and migration is often linked to a “slow” life-history strategy characterized by low fecundity, delayed maturity, and high annual survival. Understanding the seasonal patterns of mortality underlying annual survival is central to understanding the origins of migration, the regulation of population numbers, and targeting conservation action at critical life-stages. Seasonal survival estimates offer insight into why migration arose and how it is maintained, for example, high mortality during migration may be offset by lower mortality during stationary periods, and help identify environmental factors that limit or regulate populations, as well as stages where losses matter most for harvest management and conservation planning. A variety of statistical methods, from early constant- and discrete-time models to new continuous-time approaches enabled by high-resolution tracking devices, allow estimation of these seasonal survival rates. This talk reviews these methods and presents new insights from case studies on seasonal demography in migratory birds.

Scientific Committee

SUSANNE ÅKESSON (Lund University, Sweden)
NATALE EMILIO BALDACCINI (Pisa University, Italy)
GUIDO CHELAZZI (La Colombaria, Italy)
ALBERTO UGOLINI (La Colombaria, Italy)

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The event will take place in the **Conference Room of the Academy “La Colombaria”**, Via Sant’Egidio, 23 Firenze, and will be live - streamed in the **Historical Hall Dino Campana of the Oblate Library**.

Reservation is mandatory and must be made by calling **+39 055.291923** or writing to **info@colombaria.it**, by **15th November 2026**.

Livestream available on Zoom
https://us02web.zoom.us/j/82660517660
Free admission

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*La*COLOMBARIA
ACCADEMIA TOSCANA DI SCIENZE E LETTERE DAL 1735



17th DECEMBER 2026

International workshop

ANIMAL MIGRATIONS IN A CHANGING PLANET

Organized by
Accademia Toscana di Scienze e Lettere “La Colombaria”

9.15 Welcome address by the President of the Academy, Guido Chelazzi

9:30 A.M. FIRST SESSION

Chair: NATALE EMILIO BALDACCINI
(Pisa University, Italy)

THIJS BOSKER
(Leiden University, the Netherlands)



Marine Mammals on the Edge. Impact of pollution and Climate Change on Marine mammals

Cetaceans are increasingly recognized as key indicators of marine ecosystem health, yet face growing pressure from human-induced stressors. Large filter-feeding whales ingest substantial quantities of microplastics, primarily through their prey rather than direct filtration, with modeling suggesting whales in coastal waters may ingest millions of particles per day, far exceeding estimates based on water sampling alone. Microplastic ingestion proves widespread across cetacean species and regions. At the same time, climate change is driving large-scale shifts in distribution, habitat use, and migration patterns, as warming seas and declining sea ice push many species poleward, disrupting ecological interactions and raising extinction risk for some. Understanding these combined stressors is critical for effective marine conservation.

PAOLO LUSCHI
(Pisa University, Italy)



Navigating a changing ocean. Sea turtle migrations in a warming sea

Sea turtles undertake long migratory journeys, often hundreds or thousands of kilometres, to complete their life cycles, making them potentially sensitive to rising sea temperatures. Documenting such effects is not simple, but modern biotelemetry now offers meaningful insights into how climate change affects turtle movements. This talk reviews current knowledge on sea turtle migration across species, then focuses on loggerhead turtles (Caretta caretta) in the Mediterranean, where 20 years of satellite tracking have revealed a northward shift in cold-season habitats and longer stays in offshore waters. Recent tracking data further show that loggerheads adjust their diving and activity patterns in response to temperature.

SUSANNE ÅKESSON
(Lund University, Sweden)



Swift life on the wing in a changing world

Long-distance migration allows animals to track resources separated in time and space. Swifts, among the most aerial of birds, undertake some of the longest migrations known, timing their movements to seasonal insect prey across continents. Using microdataloggers, we tracked individual swifts to reveal that several species remain airborne throughout the entire non-breeding period, pushing physiological limits to the extreme. Tracking data show differential timing and migration strategies between populations, including an unusual pattern among European common swifts wintering in sub-Saharan Africa, likely linked to competition for resources. Our findings also reveal how swifts adapt their movements as foraging conditions worsen, alongside higher mortality linked to extreme weather events.

2:00 P.M. SECOND SESSION

Chair: SUSANNE ÅKESSON
(Lund University, Sweden)

BARBARA HELM
(Swiss Ornithological Institute, Sempach, Switzerland)



Migration in the light: migratory birds facing artificial light at night

Bird migration is deeply rhythmic, occurring at specific times of year and, within each season, at specific times of day and night, governed by the birds' endogenous biological clocks. This rhythmic organisation works closely with directional cues and compass systems, for which knowing the right time is essential. Yet these clocks are highly sensitive to light and darkness, the very cues that trigger and synchronise key life events. While this sensitivity long enabled precise migratory timing, it has become a growing liability: artificial light at night (ALAN) is disrupting birds' once-reliable internal clockworks. This talk examines how clocks underpin migration, how artificial light disrupts them, and what we know about the consequences for migratory birds.

JESPER MADSEN
(Aarhus University, Denmark)



Social learning: a key trait in the adaptation of migration by Arctic waterbirds under rapid climate change

Birds migrating to the Arctic to breed must adjust their annual routines to the short Arctic summer season to ensure successful reproduction. Herbivorous species like geese time the hatching of eggs to match the peak nutritive value of food plants, optimal for gosling growth and survival. To achieve this, geese must arrive on their breeding grounds and start egg-laying before vegetation growth begins, often while the tundra is still snow-covered, relying on body fat and nutrient reserves built up further south to buffer a late snowmelt. In late years, the drain on these reserves may cause most pairs to abandon the breeding attempt. Polar amplification makes the Arctic the fastest-changing region on Earth, challenging the delicate timing of pre-breeding and breeding events. Several goose populations have also grown substantially in recent decades, intensifying competition for food resources. Recent studies show that in long-lived, family-bonded species, social learning can speed up migration and range shifts, offering a mechanism for ecological rescue in a changing world.

CHRISTIAN VOIGT
(Leibniz Institute for Zoo and Wildlife Research, Berlin, Germany)



Migratory bats moving through the Anthropocene

Bats are the second most species-rich mammalian taxon, found on all continents except the polar regions. Despite being an ecological and evolutionary success story, they struggle to cope with rapid human-driven change, primarily due to their low reproductive rate and dependence on various habitats throughout the annual cycle. While seasonal movements between a summer and a hibernation site are well known, it is less widely known that bats also undertake long-distance migrations spanning entire continents. Focusing on European bats, this talk describes what we know about bat migration, how they navigate unfamiliar terrain, and how their physiology enables such endurance exercise. It also covers the threats faced by migratory bats and how we might mitigate the impacts of light pollution, wind turbine expansion, and climate change, closing with a brief look at bat migration and conservation opportunities elsewhere in the world.