Fuglene kan dele opp distansen i flere kortere eller lengre etapper. Jo mindre fuglen er, desto kortere etapper. Tiden på rasteplassene brukes til å spise og hvile. En liten fugl har i beste fall "drivstoff" nok til å fly i opptil 70-90 timer. Dette gir en aksjonsradius på inntil 4000 km.

Fett er fuglenes "flybensin", og jo mindre "drivstofftank", desto oftere må fuglen "etterfylle drivstoff". Aksjonsradiusen avhenger både av størrelsen på fuglen og fettprosenten i kroppen. Små fugler må ta seg mer tid til å bygge opp tilstrekkelige fettreserver før de legger ut på lange etapper.

Bird Migration

At our northerly latitudes a large proportion of the breeding birds make seasonal movements. The main reason for this is that many bird species cannot overwinter in the areas where they breed as their food supply becomes reduced or disappears entirely, or conversely that they cannot breed in their wintering areas due, for example, to greater competition from other species. It is their diet that largely determines when and how far the different species migrate to their winter quarters.

In reality most migrants spend most of their lifetime in areas outside Norway. There can be several reasons why bird species come to Norway to breed. One important aspect is that in the summer months food is available that is not utilized by the resident species. This consists mainly of insects, but also plant food. Another aspect is that days are longer up north, so there is more time for foraging and feeding young. In the winter quarters many species are usually gathered in the same area, and there is greater competition for nest sites and food during the breeding season. As the species maintain their migratory behaviour, there must on the whole be more advantages than disadvantages in breeding in Norway, even though the birds are exposed to many dangers during migration. The basic mechanism for the maintenance of migratory behaviour in a population is that migratory birds produce more viable young than those that do not migrate.

In general it is the insect-eaters that migrate earliest in autumn and arrive back latest in spring, and many of these winter in Africa. Many species that are associated with fresh water and wetlands, such as many waders and ducks, must also leave their breeding areas in winter, when the water freezes. Those species which feed on seeds and corn can winter in Norway, but many migrate southwards to other European countries anyway. It is also often the case that only part of the population migrates southwards, while the remainder stay for the winter in the breeding areas.

Most of the species that migrate from Norway fly south and winter in Europe or Africa. Some of the seabirds migrate westwards towards Iceland, Greenland and the east coast of Canada, while other species, such as Bluethroats and Red-necked Phalaropes, migrate south-eastwards and winter in eastern Europe and Russia.

Patterns of movement

Birds can perform several different kinds of movement, and a distinction is often made between three main types of movement: dispersal, nomadic movements *and* seasonal migration. *In addition the terms* vagrancy *and* irruption *are often used.*

Dispersal *consists often of rather random movements, as regards both distance and direction. Nevertheless, some directional movements may be called dispersal. What distinguishes dispersal from migration, whether or not it is directional, is that most individual birds will overwinter near the breeding areas, and the number of individuals will decrease exponentially in relation to the distance from the breeding area (Salomonsen 1972, Nelson 1980).*

Nomadic movements *occur when the birds, outside the breeding season, constantly move to new areas, usually to find new food sources (Berthold 1993).* Nomadic movements *are also related to* vagrancy *and* irruption. *Species that behave in this way are often called vagrants or irruptive species. An irruptive species is one which suddenly appears in large numbers at irregular intervals.*

Seasonal migration *can be defined as regular movement between breeding areas and wintering areas (Berthold 1993). The term can be further divided into two categories with a gradual transition:* long-distance migration *and* short-distance migration. *Our short-distance migrants winter in Europe, while the long-distance migrants fly south beyond the Mediterranean and the Black Sea. Seasonal migration can be further divided into many types, and three main categories are divided* migration, leap-frog migration *and* loop migration.

Divided migration *consists of certain parts of the population, such as age-groups and sexes, wintering in different areas. This phenomenon applies mainly to short-distance and medium-distance migrants. In many cases the males winter nearest to the breeding areas, while juveniles and females move further, and young females are found furthest from the breeding areas (Berthold 2001).*

Leap-frog migration *consists of a northerly population having its wintering area south of the wintering area of a more southerly population. This means that individuals of the northerly population migrate over and past both the breeding areas and the wintering areas which are used by the birds breeding further south.*

Loop migration *takes place in species that use different routes to and from the winter quarters.*

Navigation

Migrants use several different methods of orientation. Birds that are daytime migrants use the sun as a compass, while night migrants use the stars. In overcast weather birds can make use of a magnetic compass which can register the Earth's magnetic field. Birds also use the landscape for orientation, and for example the coastline or valleys can be used as guidelines.

Migration speed and energy consumption

Ahlerstam (1982) gives the normal migration speed to be from about 30 km/h for the smallest birds and up to 80 km/h for larger birds.

Birds may divide the journey into shorter or longer stages; the smaller the bird, the shorter the stages. Time spent at stop-over sites is used for feeding and resting. A small bird has at the most enough "fuel" to fly for up to 70-90 hours. This gives a movement radius of up to 4000 km.

Fat is the "air fuel" -of birds, and the smaller the "fuel tank" the more often the birds must fill up. The movement radius depends both on the size of the bird and the percentage of fat on the body. Small birds have to spend more time building up sufficient fat reserves before starting out on long stages.

Bruk av fangstnett har vært en viktig fangstmetode for ringmerking av fugler. I Norge ble de første fangsnettene tatt i bruk i 1961. Her fra ringmerking på Jåbekk i Vest-Agder i juli 2003.

The use of mist nets has been an important method of catching birds for ringing. In Norway mist nets were first used in 1961. Here we see the net captures at Jåbekk in Vest-Agder in July 2003.