Why Waterfowl Migrate

Ducks and geese fly long distances to find the resources they need to survive and reproduce

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"By three o'clock, large flocks of mallards began to leave the lake and prairies and headed east and southeast for the river and refuge from the stinging blasts of wind and snow. The bands of waterfowl sensed that this was the end for them at this latitude," wrote William C. Hazelton in *Days Among the Ducks*.

Actually, the ducks Hazelton described "sensed" key changes in their environment long before the December blast ultimately pushed them southward. While a dramatic change in weather was the immediate signal for the birds to find food and habitat elsewhere, the internal clock that determined their departure was set months before by the gradual lengthening of spring daylight.

Among waterfowl, regular seasonal movements (i.e., migration) are driven by changing photoperiod, the relative length of day and night during a 24-hour period. As a result, migration is physiologically "hard-wired" in waterfowl and other migratory birds. Beginning in spring, increasing day length affects hormone response and starts the clock ticking. Accumulation of fat, migration, breeding, and the molt follow in succession over the next weeks and months.

The prompt for fall migration is not as clear but is most likely related to the timing of reproductive events and molting. The result, however, is just as predictable. During a period of long days with gradually decreasing daylight, birds again accumulate fat reserves for migration and become restless—in a behavior known as *zugunruhe*—setting the stage for their departure south.

And that's a good thing. If not for their innate departure schedules, waterfowl would not be prepared for migration and seasonal changes in weather and habitat. The northern prairies and parklands, for example, become increasingly inhospitable places for waterfowl as fall progresses. By mid-November the average high temperature in Saskatoon, Saskatchewan, is below freezing, and by January the average low temperature in Bismarck, North Dakota, falls below zero. By this time, most ducks have long since migrated south to their wintering grounds, where habitat conditions are much more favorable. Recent climate trends notwithstanding, general patterns of temperature and precipitation in North America have remained largely unchanged for millennia. For example, snow accumulated in Bismarck from November to March still begins to melt in April, creating optimal breeding habitat for returning waterfowl. Precipitation in St. Joseph, Missouri, usually declines after May, and the germination and growth of seed-producing plants in drying wetland basins provide food for fall migrants. And in south Louisiana, annual peak rainfall often occurs in September, recharging coastal wetlands for early

migrating blue-winged teal and later for wintering waterfowl. Along with photoperiod, seasonal changes in habitat conditions account for the general timing of waterfowl migrations that have developed over thousands of years.

Yet this is where the predictability of migration stops. Year to year, migratory departures are triggered by short-term changes in weather and habitat conditions. And waterfowl hunters pay considerable attention to day-to-day changes in weather—cold fronts, temperature, precipitation, and wind—as the waterfowl season approaches and throughout the days that follow opening day.

Fall weather affects habitat conditions and the availability of food needed for birds to store energy-rich fat reserves prior to migration and to replace these reserves following long-distance flights. Historically, annual plant seeds, aquatic plants, acorns, and other mast provided the food resources the birds needed for migration. On the contemporary landscape, however, agriculture plays a much more important role. Regardless, understanding the amount and distribution of food can help waterfowl hunters assess whether habitat is suitable for migrating and wintering waterfowl—and waterfowl hunting. A spring frost affecting the acorn crop, untimely summer flooding that reduces annual seed production, rain-delayed crop harvests, and a number of other weather and habitat interactions can have a significant influence on whether or not waterfowl delay, stay, or go away. In general, less food means more rapid transition and departure of ducks and geese.

Precipitation, whether in liquid or solid form, has an especially big influence on waterfowl food availability and, consequently, habitat use. Ducks respond to changing water levels. Generally speaking, declining water levels are not as favorable for waterfowl as rising water, which creates gradually expanding wetland margins and newly inundated food resources. Constant attention to approaching weather systems

can help hunters anticipate possible changes in precipitation as well as water levels and waterfowl use. After a major front accompanied by significant precipitation passes, ducks will be much less likely to feed in the same places they fed the day before.

Of course, water in solid form as snow or ice also triggers waterfowl migration, bringing the practical end to the hunting season in many areas and considerable changes in hunting conditions in others. Ducks either migrate south or change local movement patterns in response to declining open water and food availability. Snow buries food or at least makes it less available. And ice cover significantly reduces habitat available to ducks and often to duck hunters as well. Ultimately, these wintry conditions force the departure of all but the hardiest waterfowl, bringing flights of new birds to waterfowlers down the flyways. No wonder duck hunters pay particularly close attention when snow and cold temperatures occur to their north—new birds are coming!

When waterfowl migrate also often depends on wind direction and velocity. Flight is energetically expensive, and birds can migrate more efficiently when they have a tailwind. In spring, southerly winds, falling barometric pressure, and increasing temperatures are optimal conditions for waterfowl migrating northward. In fall, waterfowl migrations, which often occur at night, are usually associated with north to northwest winds, falling temperatures, and high-pressure systems.