Weather Effects on the Great Cormorant (*Phalacrocorax carbo*)

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I have been conducting a cormorant census at the Sagami-hara Reservoir (Sagami-hara-shi, Kanagawa Prefecture) for several years (Ishida 1999). I spend many hours observing and recording the movements of the Great Cormorant (*Phalacrocorax carbo*). There are several observations that I would like to report.

Cormorants appear to be very sensitive to weather conditions. This is especially true on windy days. On very windy days, the cormorant face towards the wind and hunker down on their bellies. At this time, they have their heads pointed up to the sky. In this way they reduce the amount of wind that actually touches their bodies and can keep their balance easier. Very few remain standing and none have their wings spread to dry. On August 31, 2000 at Isobe (Sagami River, Kanagawa Prefecture), the weather quickly turned from sunny to very cloudy and threatening. The cormorant, ducks and herons became very restless. When it began to thunder in the distance, all the birds including the cormorant became very still. There were none flying around or with their wings spread to dry. Upon further observation, as the thunder moved closer, the cormorants began to hunker down and make themselves very small. There was a very loud clap of thunder and all of the cormorant flew up at once in fright. They circled around several times and then landed on the same tree but on the backside that faces away from the water. None landed in or near the water or on the part of the tree that faces the water. It appears that they could sense the danger of lighting and water. They also appeared to be able to sense the changes in atmospheric and barometric pressures and acted accordingly. Before it actually began to thunder and lighting, they had prepared by hunkering down, making themselves small and remained still. I have also noted that at the reservoir, the cormorants return earlier to their roosts in the late afternoon when the weather looks like it will turn bad.

Another example of weather effects on cormorant. When the temperature becomes very high (above 30 C), the juveniles have a hard time coping with the heat. They often enter the water to cool off and then return to the floats. They repeat this each time they get too hot. All of the juveniles are very unsettled on days like this. However, the adults are usually calm. The young take out their frustration from the heat on the other cormorant. They often attack each other by pecking feathers and stalking. When the young attack an adult, the adult gets mad, attacks back and makes a deep reprimanding sound. The adults are able to cope with the heat much better than the young. Over a certain temperature is not favorable for either the young of adults and each have different ways of dealing with it. The adults deal with the heat by fluttering their gular pouches and by keeping still, using as little energy as possible. The young deal with it by taking their aggressions out on other cormorant and by often diving

into the water to cool off. The temperature limit that the young can stand appears to be much lower than that of the adults. Could this be due to the lighter color of their feathers? Also on very hot days, I have noticed that very few cormorant hunker down on the floats. They tend to stand upright to catch as much of the breeze as possible.

On the other hand, on cold winter days, the cormorant hunker down on the floats and tuck their heads into their back feathers to keep warm. They also swim around in the water a lot less than on hot days. However, I have never seen cormorant, fluffing up their feathers to keep warm like other birds when they are cold.

In conclusion, weather conditions affect cormorant in several ways. Cormorants react to low barometric and atmospheric pressure, wind, heat and cold. Because cormorant are a large bird and only have a small fat reserve on their bodies, I assume the dissipating heat, keeping warm and flying under windy conditions has an affect on them and also takes much energy. Like other birds, cormorant can sense weather changes before humans and react accordingly.

Cited references

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カワウへの天候の影響

神奈川県相模原市相模川貯水池（沈殿池）と近在の磯部の場で、数年来調査を続けてきたところ、カワウが天候の変化や気温の高低によく反応して、対処していることがわかった。また、高温下では成鳥と幼鳥の耐暑行動に差異がみられた。（抄訳：福田道雄）