Preface

Crows have been the cause of various problems in urban areas of Japan in recent years. These include their scattering of garbage on streets, attacking people in residential areas, placing stones on railroad tracks, causing electrical outages by nesting on high-voltage power poles, causing fires by carrying candles into treed areas, and colliding with aircrafts and trains. These conflicts between crows and humans are becoming more common, particularly in and around Tokyo, and the mass media often cover these incidents as curiosities or important news stories. The amount of such television and newspaper coverage has increased dramatically in the past several years. In response, there has been an exponential increase in the number of requests to local or central governments to address the crow problem. The Tokyo metropolitan government has started trapping crows and removing nests containing their eggs and young in parks and many other areas.

These conflicts between crows and humans are associated with the population increase of crows in urban areas. A larger number of crows increases the chance of conflict with humans. The population increase of crows is probably linked to the increase in the quantity of discarded food in garbage, which crows feed on. Having more food in garbage will increase the survival rate and breeding success of crows, resulting in an increase in crow population. The number of crows in a particular area is also related to garbage collection systems. If garbage is removed early in the morning or during the night, crows cannot access it even if the quantity is large, and they will soon leave the area.

The conflicts between crows and humans are being perceived as being so serious that governments and companies now spend huge amounts of money to control crows. Many such efforts, however, are not based on scientific data evaluating how serious the conflicts actually are, in what way and how many crows can be controlled, and the effectiveness of measures. Under such conditions, controls of the number of crows in particular areas will not necessarily result in a significant reduction in crow populations and conflicts. In order to manage crows properly, it is crucial to know their population trends, breeding success, survival rates, habitat uses, food habits and local movements. To reduce the conflicts with humans, we need to show the mechanisms causing the conflicts.

In this special issue of the Global Environmental Research, we will show the present state and mechanisms of some of the conflicts between crows and humans in urban areas. In the first article, Mutsuyuki Ueta and his colleagues describe the population trends of crows in Tokyo. They collected data on the population and distribution of jungle crows (*Corvus macrorhynchos*) and analyzed the possible factors affecting trends. Their findings show that crows started to increase when household garbage began to be disposed in plastic bags for pickup, but not when the amount of food scraps in the garbage reached its peak. The next two articles focus on crow problems, such as food scraps being scattered by crows at garbage sites, and discuss some effective management measures to reduce the problems. Reiko Kurosawa and her colleagues worked in the greater Tokyo area, and Makiko Takenaka in Sapporo, northern Japan.

The next three articles cover specific crow behaviors. Hiroyoshi Higuchi and his co-workers studied the behavior of crows that stole soap bars from a kindergarten. They traced the soap bars by inserting transmitters into the bars, and studied why the crows took the soap and what they did with it. Hiroyoshi Higuchi discusses another strange behavior of crows—stealing candles from shrines, which may be linked to fire outbreaks. He suggests that a total of seven fires that have occurred near shrines in the last few years in Kyoto are likely the work of crows. Higuchi and Emiko Morishita report on another dangerous behavior of crows—placing stones on railroad tracks—and show that the behavior is associated with their hoarding habits, as in the cases of soap bars and candles.

The next two articles are about the spatial distribution and movements of crows in urban areas. Kazuhiro Katoh and Takashi Nakamura studied the distribution of crows through observations in open spaces such as parks and cemeteries. They clarify the role of such open spaces in crows' daily flying activity. Morishita and Higuchi report their results of tracking the local movements of crows using a personal handy phone system (PHS). They show the daily movement patterns and the differences among individuals and between seasons. This is the first report in Japan on the detailed movements of crows in urban areas. The ninth article describes the food habits of crows, revealed by analysis of pellets and feces and through direct observation. It shows that crows exploit a wide variety of foods in response to temporal and seasonal availability in both urban and rural areas, and suggests

that if food scraps in urban areas could be reduced, a great proportion of the food currently available to crows would be lost.

In the final article, Masaki Okuyama reports on governments' measures to deal with crows, based on his experiences as a government officer in charge of the issue. He emphasizes the importance of cooperation among related sections within a government and among neighboring governments, and states that efforts of Japan's Ministry of the Environment are aimed at enhancing the flow of information and awareness among all the parties concerned.

All studies except the last one were conducted independently from each other and from governments. As a result, these studies are not systematically connected to each other, and some important information on population dynamics and other topics is absent from this issue. But I believe that this collection of articles will be useful when considering the management of crows and reduction of conflicts between crows and humans. I also hope that this issue will encourage wildlife biologists and government officers to conduct further studies on the relevant subjects.

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Responsible Editor of the issue