Sentinels for the Environment

Birdwatchers in Taiwan and Hong Kong

FRÉDÉRIC KECK

ABSTRACT: This article compares the modes of organisation and engagement of birdwatching societies in Taiwan and Hong Kong. Tracing their origins to American, Japanese, and British models of nature conservation, it shows the growing involvement of Chinese citizens in the observation and protection of birds. Asking how birds can be used as "flagship species" to hold together environmental movements in a sustainable and constructive way, the article proposes the concept of "sentinel" to capture the mix of democratic environmental concern and a military model of territory mapping.

KEYWORDS: birdwatching, flagship species, biodiversity, conservation, sentinel.

The development of birdwatching societies has received attention from social sciences and environmental humanities as a good example of a passion for nature turned into political commitment. However, this connexion between nature and politics is itself highly contextualised, and depends on cultural models of perception and action. Anthropologist Robert Weller showed that the development of birdwatching societies in Taiwan and China can be linked to the globalisation of the Western view of nature by the work of NGOs. "Bird watching," he writes, "was one of the first signs of a changing popular conception of nature both in China and Taiwan." [1] In particular, Weller shows how the Western view of nature carried by NGOs came into alliance or conflict with local attachment when fighting against construction projects.

The involvement of birdwatchers in nature conservation is indeed an American model. [2] Launched after Audubon published his paintings of birds at the beginning of the nineteenth century, birdwatching societies developed in opposition to hunting societies, whose practices they tried to regulate. They also accompanied the enclosure of national parks where wilderness was preserved and biodiversity assessed. By refraining from hunting birds to observe them through the naked eye, binoculars, or cameras, birdwatchers introduce a concern for nature as an autonomous value. If watching birds has always been a form of human leisure and a collective practice, the organisation of preserved natural areas where lists of bird species can be assembled is an American invention of the nineteenth century that was "imported," says Weller, to Taiwan and China. [3]

Yet the idea that NGOs "imported" a Western concern for nature as a value is insufficient to describe the appropriation of birdwatching by Chinese citizens. The development of birdwatching was not only a detached contemplation of nature but also an imperial project to monitor and control territorial resources, as birds indicate the wealth of and threats toward a territory. There is clearly an ambivalence in the "passion for birds," which is also a passion for exhausting the world with lists of species. [4] To understand how a Chinese citizen shifts from a singular perception of birds to a collective protection of nature, it is necessary to describe how he/she deals with this ambivalence. An anthropology of globalisation must be completed by a sociology of critique to describe the various modes of engagement, from perception to mobilisation, through which birds become involved in critical collectives, and to show how these collectives can expand. [5]

This article will develop the concept of sentinel to describe the ambivalence between biodiversity and biosecurity as two Western values that become mixed in Chinese practices of birdwatching. The use of birds as sentinels of environmental threats is a major trend, as the beauty of a bird can become the consensual value around which different groups gather to protect a contested site. But if these "flagship" species bring the attention of tourists or politicians to a threatened environment, they can also reduce its environmental value to the defence of a single species. [6] By contrast, the notion of sentinel is also used for threats that affect humans and non-humans alike, such as infectious diseases or nuclear radiation. [7] Here, the concept of sentinel refers to the frontline of a military battle, where signs of threats are easier to perceive.

By comparing the development of birdwatching societies in Hong Kong and Taiwan, this article will explore this double meaning of sentinel. The

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1. Robert P. Weller, *Discovering Nature: Globalization and Environmental Culture in China and Taiwan*, Cambridge, Cambridge University Press, 2006, p. 70.
2. Mark Barrow, *A Passion for Birds: American Ornithology after Audubon*, Princeton, Princeton University Press, 1998.
3. *Ibid.*, p. 164.
4. Vanessa Manceron, *Limn*, No. 3, 2013: www.limn.it/recording-and-monitoring-between-two-forms-of-surveillance (accessed on 5 March 2015). Even today, British birdwatchers describe themselves as "volunteers," which is a military term.
5. Luc Boltanski and Laurent Thévenot, *De la justification. Les économies de la grandeur*, Paris, Gallimard, 1991; Claudette Lafaye and Laurent Thévenot, "Une justification écologique? Conflits dans l'aménagement de la nature," *Revue française de sociologie*, Vol. 34, No. 4, 1993, pp. 495-524; Francis Chateauraynaud and Didier Torny, *Les sombres précurseurs: une sociologie pragmatique de l'alerte et du risque*, Paris, EHESS, 1999. The idea that the involvement of humans in environmental movements depends on their relations to the non-humans they claim to protect also comes from Bruno Latour, *Politiques de la nature. Comment faire entrer les sciences en démocratie*, Paris, La Découverte, 1999, and Philippe Descola, *Par-delà nature et culture*, Paris, Gallimard, 2005.
6. See Diogo Veríssimoetalii, "Birds as tourism flagship species: A case study of tropical islands," *Animal Conservation*, Vol. 12, No. 6, 2009, pp. 549-558. For other wildlife species considered as iconic, see Joy Zhang and Michael Barr, *Green Politics in China: Environmental Governance and State-Society Relations*, London, Pluto Press, 2013, Chap. 2, "Ways of Seeing" (on the Yunnan "snub-nosed monkey" and the Tibetan antelope). See also Chris Coggins, *The Tiger and the Pangolin: Nature, Culture, and Conservation in China*, Honolulu, University of Hawai'i Press, 2002.
7. See Frédéric Keck and Andrew Lakoff (eds), "Sentinel devices," *Limn*, No. 3. On the use of birds for the research on infectious diseases, see Peter Doherty, *Sentinel chickens*, Melbourne, University of Melbourne Press, 2011. On the effects of nuclear radiation, see Anders Moller et al., "Abundance of birds in Fukushima as judged from Chernobyl," *Environmental Pollution*, Vol. 164, 2012, pp. 36-39.

emergence of a rich urban middle class that can afford the equipment to watch birds and take photographs leads to a reappraisal of natural areas and a criticism of development projects threatening bird species. Taiwan and Hong Kong are important feeding sites for birds that cross the South China Sea on the East Asian-Australasian flyway, which leads birdwatchers in these two areas to exchange observation techniques about the same protected species. The wetlands of the Pearl River Delta and of the Taiwan Strait are rich habitats for migratory birds, while the forests of the New Territories and inner Taiwan shelter an important biodiversity of resident birds.

However, Hong Kong and Taiwan are also interesting to compare in the way they developed Western models of environmental governance, from Great Britain in Hong Kong, and from Japan and the United States in Taiwan. They share the same ecology of bird migration, but also the same politics of interface between the West and mainland China. If birds are "sentinels" of environmental threats in these two territories, it is because these territories are also "sentinels" for other political concerns; that is, places where information becomes accessible on threats coming from mainland China. While Taiwan and Hong Kong are often regarded as the vanguard of China in terms of economic development or political reform, describing them as sentinels reveals the other side of the same process: their acute sensitivity to the vulnerabilities of contemporary China. It may well be that the mobile and sensitive characteristics of birds make them an emblematic species of the sentinel status of Taiwan and Hong Kong against the backdrop of China's impending environmental disaster.

This article then sheds light on the daily activities of birdwatching through the history of its indigenisation, both as protection of nature and biodiversity and as concern for health and biosecurity. By looking at contemporary modes of observing and counting, the article asks how the military model of surveillance has been transformed into democratic modes of monitoring. It proposes a contribution to the study of Hong Kong and Taiwan as "post-colonial societies" through the practices of birdwatching, that is, through the involvement of ordinary citizens in the protection of the environment. The article is divided into two parts: first, it traces the history of the organisation of birdwatching societies in Taiwan and Hong Kong under US and British tutelage; second, it looks at the differences introduced by democratisation and independence on the organisation of birdwatching societies and on their observational practices.

Birdwatching practices as a Western military heritage

If Chinese zoology is full of birds, partly imaginary and partly real, [8] the method of collecting and classifying birds was introduced in the nineteenth century by British naturalists such as Swinhoe and La Touche. [9] These naturalist practices were part of colonial rationalities for collecting individual specimens and monitoring species diversity. They can be described as "military," since the first birdwatchers were colonial officers who practiced hunting and surveillance through an authoritarian form of governance. It is then possible to ask how these military models were transformed into democratic movement in a "post-colonial" period characterised by the indigenisation of birdwatching practices at the end of the twentieth century. What are the passage points between a military sentinel, which defends a territory against a political enemy, and an environmental sentinel, which protects a habitat against an environmental threat? Why is there a parallel between the indigenisation and the democratisation of birdwatching societies in Taiwan and Hong Kong after a period of authoritarian control following Western models of governance? How were Chinese citizens gradually involved in systems of classification of Chinese birds? How has it changed their relations with mainland China?

Taiwan under Japanese and American protection

During the Japanese colonial period (1895-1945), the number of bird species observed in Taiwan increased from 260 in 1907 to 393 in 1942. [10] Ornithologists Seinosuke Uchida and Nagamichi Kuroda took field trips to Taiwan in 1915 and 1916 to observe specimens in the museums of Taipei and Tainan, and proposed the first hypotheses on the evolution of birds in China, Taiwan, and the Philippines. Between 1932 and 1936, Yoshimaro Yamashina organised a team of collectors: they brought more than 2,000 specimens of birds, nests and eggs to Tokyo, where he set up the Yamashina Institute, the main centre for ornithology in Asia. They published the first encyclopaedia of Taiwanese birds in Taipei. [11] Yet these observations were separate from any local knowledge, particularly that of Aboriginals. [12] While local hunters were hired to collect specimens, their classification depended entirely on Western criteria, followed by Japanese ornithologists.

After the end of the Pacific War, Taiwanese people first began participating in the observation of birds. Under the regime of Chiang Kai-shek, this participation took the form of military enrolment in an international program of biosecurity. The "Migratory Animal Pathological Survey" (MAPS), led by Elliott McClure from 1963 to 1971 for the US Army, played a decisive role in Taiwanese birdwatching. Trained in wildlife management in the US and a member of the American Ornithological Union, McClure had moved to Tokyo in 1950 to study arthropod borne zoonoses such as Japanese encephalitis. He collected blood samples from birds and sent them to the US to check if they carried pathogens. In 1958, he moved to the US Army Medical Research Unit in Kuala Lumpur, where he started a project with Colonel Barnes to capture and band birds throughout the Far East so as to assess the spread of Japanese encephalitis. McClure ran the project from Tokyo and set its headquarters in Bangkok. It involved 13 teams in nine countries and banded more than one million birds of 1,218 species. [13] A military program for the control of zoonoses thus

8. See Roel Stercx, *The Animal and the Daemon in Early China*, Albany, State University of New York, 2002; Carla Nappi, *The Monkey and the Inkpot: Natural History and its Transformations in Early Modern China*, Cambridge, Harvard University Press, 2009, p. 116.
9. A British consular official, Robert Swinhoe was stationed in Xiamen and Ningbo between 1855 and 1875, and made observations in Hong Kong and Taiwan, where he was vice-consul between 1860 and 1866. His notes were published by the journal of the British Ornothological Union, *Ibis*, in 1861. A British customs official, John David Digues La Touche lived in Fujian between 1882 and 1921 and published a *Handbook of the Birds of East Asia* in 1925 and 1934. See Fa-Ti Fan, *British Naturalists in Qing China: Science, Empire, and Cultural Encounter*, Cambridge, Harvard University Press, 2004. Mention should also be made of Père Armand David, a French Catholic priest who discovered many birds of China as well as the Giant Panda around 1870.
10. Tzung-Su Ding, "A Checklist of the Birds of Taiwan," homepage.ntu.edu.tw/~ding/aves/chcklst_readme.htm (accessed on 5 March 2015).
11. Hachisuka Masauji and Udagawa Tatsuo, *Contributions to the Ornithology of Formosa*, Taipei, Taiwan Museum, 1950.
12. See Scott Simon, "Émissaires des ancêtres: les oiseaux dans la vie et dans la cosmologie sadyaq," *Anthropologie et sociétés*, Vol. 39, No. 1, 2015.
13. Masashi Yoshii and Nagahisa Kuroda, "In Memoriam: Elliott McClure 1910-1998," *The Auk*, Vol. 116, No. 4, 1999, pp. 1125-1126. The final report was published under the title *Migration and survival of the birds of Asia*, Bangkok, White Lotus Press. But the observational data have been lost. See also Libby Robin, *The flight of the emu: A hundred years of Australian ornithology 1901-2001*, Melbourne, Melbourne University Press, 2001, pp. 246-247.

launched an ecological reflection on the habitat of birds, turning biosecurity concerns into knowledge about biodiversity.[14] It also developed an awareness of the necessity to study the migratory flyways of East Asia at an international level. Following the pathways of pathogens among birds provided all kinds of information on their mode of life.

The team in Taiwan was led by Paul Alexander and Sheldon Severinghaus, who taught biology and ornithology at Tunghai University in Taichung. They captured and banded more than 160,000 birds and sent the records to McClure. They later published the first Taiwan field guides in both English and Chinese: *A Guide to the Birds of Taiwan* (1970) and *A New Guide to the Birds of Taiwan* (1976).[15] Lucia Liu, born in Taiwan, joined the program as the assistant of Sheldon Severinghaus, and married him after studying ornithology at Cornell. She later became a reference in Taiwanese ornithology, and recently compiled *The Avifauna of Taiwan.* This encyclopaedia provides all kinds of information on Taiwanese birds: the meaning of the scientific name, where the voucher specimen is, the history of collection, measurement, morphology, habitat, breeding, song, conservation, and distribution maps.[16] This major accomplishment of Taiwanese ornithology, rivalling the previous encyclopaedia of 1950, found its upspring in the banding program of MAPS, which Lucia Liu describes as an "umbrella" for birdwatching under a military regime:

> It was by name focused on pathology. But Dr. McClure was also interested in bird migrations. So the pathological study served as an umbrella, and team members did bird work. But the people who were involved in Taiwan in the early days were not birdwatchers. For some of them it was a job, and the conditions were tough. Some of them didn't enjoy fieldwork that much. It was very different from members of birdwatching societies who go out for pleasure now.[17]

Among those who contributed to the development of Taiwanese birdwatching as leisure, and not only as a job, is Peter Chen (陳炳煌), who studied ecology in the US and later taught it at Tunghai University. As one of the first members of MAPS, he describes this program as an encounter with the materiality of the bodies of birds. Indeed, banding requires care and attention in the capture of a bird on which information is noted, and in the attachment of rings, as the bird is released to be captured by another banding group in another location. The practice of banding transformed the encounter with birds into a set of data. Birdwatching oscillates between the singularity of a physical encounter with an individual (by gaze or physical contact) and the generalisation of knowledge about the species.

> We set up nests to put rings, with two numbers on the ring: an identification number and a mailing box in Hong Kong. We measured the weight, the body length, wing length. We collected parasites for pathological survey, inside and outside. We put dry powder on the plumage and lay the bird on a sheet of paper, and the parasites would fall on the sheet. We cut the central nail of the leg and collected the grease. Then we sent samples to headquarters in Bangkok and Tokyo.[18]

Peter Chen expanded this method by organising the first bird races in Taiwan. During these events, birdwatchers compete to establish the biggest list of birds on a natural site, and share the knowledge they produce with the society, drawing on the opposing values of competition and collaboration. These events imitate the races between hunters who gave some of their specimens to ornithologists after killing them, with the main difference that birds are not killed but rather transformed into records. The Christmas Bird Count, launched by Franck Chapman in 1900 in the US, attracted 200 birdwatchers in 1909 and 4,615 in 1950.[19] Peter Chen followed this model when he advertised the first bird races through the press with a lucky count. Readers of the local newspaper were asked to guess how many birds would be counted on a spot, and prizes (TV, telescope, bird books) were given to those who came closest. By drawing a map of bird distribution every year at the same time in the winter season, the bird count produced knowledge of the evolution of biodiversity of a site. The reference to Christmas was soon abandoned as a religious marker. Similar bird races are organised every year in Taiwan at springtime, with a frequency of around a hundred birdwatchers who must see the maximum number of bird species in a national park during 24 hours.

Publishing books, banding birds, organising races: all these practices assimilate birdwatching to a military form of control of biodiversity. They show striking similarities with the practices of hunters, with whom birdwatching societies have developed a reverse symmetry, imitating their organisational practices for a different purpose: knowing rather than killing. During the military regime, wearing binoculars in public was associated with spying activities and reserved for authorised specialists. Since it was forbidden to declare an association under martial law in Taiwan, a "bird club" was set up in Taipei in 1973 for Westerners who wanted to practice birdwatching. It was placed under the tutelage of the Animal Protection Association sponsored by Chiang Kai-shek. Similar clubs were created in Taichung in 1975 and Kaohsiung in 1979.

If it may appear that the protection of nature is linked to the democratisation of birdwatching, the first movement of bird protection in Taiwan induces nuance to this hypothesis. It was clearly organised from above, in a paternalistic mode, by Japanese ornithologists and by the Kuomintang government. It was aimed at protecting the Grey-faced Buzzard (*Butastur indicus*) and the Brown Shrike (*Lanius cristatus*). These birds breed in Japan and go down to the Philippines in the winter, passing by Taiwan in October and March. Japanese birdwatchers published reports about the decline of Grey-faced Buzzards, which they argued was caused by massive hunting in Taiwan for commercial purposes. The skin of these raptors is considered to be endowed with particular virtues, and many of them were sold to Japan to serve as specimens.

John Wu Sen-hsiong was a member of the Taichung Bird Club trained in the US and Japan. He is a famous figure among Taiwanese birdwatchers be-

14. See Stephen Hinchliffe and Stephanie Lavau, "Differentiated circuits: The ecologies of knowing and securing life," *Environment and Planning D*, Vol. 31, No. 2, 2013, pp. 259-274.
15. Sheldon Severinghaus and Kenneth Turner Blackshaw, *A New Guide to the Birds of Taiwan*, Taipei, Mai Ya Publications, 1975 (translated into Chinese by Lucia Liu Severinghaus); Keisake Kobayashi and Hidahoko Cho, *Birds of Taiwan*, Tokyo, Meeda Graphic Arts, 1981.
16. The role of field guides in environmental movements has been discussed: do they raise an environmental awareness by training attention to the diversity of birds, or do they narrow the perception of the environment to what can be presented in a book? See John Law and Michael Lynch, "Lists, field-guides and the organization of seeing: Birdwatching as an exemplary observational activity," *Human Studies*, Vol. 11, No. 2-3, 1988, pp. 271-303; Thomas R. Dunlap, *In the Field, Among the Feathered: A History of Birders and Their Guides*, Oxford, Oxford University Press, 2011; Spencer Schaffner, *Binocular Vision: The Politics of Representation in Birdwatching Field Guides*, Amherst, University of Massachusetts Press, 2011.
17. Interview in Taipei, 30 April 2013. All interviews were conducted in English.
18. Interview in Taichung, 27 April 2013.
19. Mark Barrow, "Coopération, conflit et contrôle: ornithologues et 'Birdwatchers' américains avant la Seconde Guerre Mondiale," in Florian Charvolin, André Micoud, Lynn K. Nyhart (eds), *Des sciences citoyennes? La question de l'amateur dans les sciences naturalistes*, La Tour d'Aigues, Éd. de l'Aube, 2007, p. 157.

Photo 1 – John Wu Sen-hsiong and his collection of bird specimens at the Taichung bird society. © Frédéric Keck

cause he stopped hunting to collect specimens from bird shops before turning to the observation of live birds in their habitat. Being trained as a mechanical engineer in Austria, he was interested in the physiology of birds, and not only by their songs like most Chinese collectors. He was contacted by members of the Wild Bird Society of Japan [20] to publish a field guide on birds in Taiwan that became highly popular, selling up to 80,000 copies. The reputation of this book comes from the quality of the drawings by a Japanese painter, picturing birds in their most beautiful movements rather than in a position that eases identification. [21] John Wu Sen-hsiong recalls a meeting with Japanese birdwatchers in 1977 that led him to engage in the protection of the Grey-faced buzzard:

> I was invited to a dinner at the Peninsula Hotel in Tokyo. There were nine persons, all famous in birding in Japan. "We're concerned that your country ships 60,000 skins of birds of prey every year!" I said, "Your country is developed, our country is developing; we have to learn from you." [22]

While the popularity of John Wu Sen-hsiong was instrumental in building the Grey-faced Buzzard as a threatened species, the final decision to protect the bird came from the top. After articles were published in the Japanese media about the cruelty of raptor-hunting (nails in heads, opened skins, eyes stacked in pyramids), President Chiang Kai-shek engaged in a protection campaign. He issued a three-year hunting ban on Grey-faced Buzzards in 1972 and declared it the "National Day Bird," because the peak migration is on October 10. In 1981, President Chiang Ching-kuo created the Kenting National Park, Taiwan's first national park, to protect the migration area of Grey-faced Buzzards. [23] It hosted the East Asian Bird Protection Conference in 1983. [24] The police confiscated 4,000 trapped birds and released them in Kenting National Park.

The creation of national parks as places for birdwatching and bird protection is another sign of the political significance of this apparent leisure activity. It is associated with the name of Hunter Eu (You Hanting), who was one of the founders of the Taipei Bird Watching Society in 1975. After being trained in natural parks management in the US, particularly at the National Park Service at the Grand Canyon, he made his career in the National Tourism Bureau of Taiwan, where he obtained the first budget dedicated to conservation in any government agency, and helped promote the first National Park Law in 1973. The Tourism Bureau remains the main sponsor of birdwatching activities in Taiwan to this day. Robert Weller is right to say: "Here we can see the direct globalising influence of the American wilderness ideal carried to Taiwan through the Park Service." [25]

Weller's view of the globalisation of American conceptions of nature can here be challenged by contrasting birdwatching societies in Taiwan and Hong Kong. During the military regime of the Nationalist government, birdwatchers in Taiwan kept a strong relation to hunting practices, such as collecting bird specimens, and to military forms of surveillance, such as programs of biosecurity. In Hong Kong, however, other kinds of military practices were formative of birdwatching during the colonial period. It is necessary to contrast these two models before showing how they could converge in the democratisation of birdwatching.

Hong Kong as a British colony

The Hong Kong Birdwatching Society (HKBWS) was founded in 1957 by British officers who wanted to establish a list of the bird species on the territory for conservation purposes. Hong Kong is a major stop-over on the East-Asian migratory flyways, as the Pearl River Delta offers many wetlands for feeding. It is estimated that around 500 species live in or pass through Hong Kong, leading to a a clear distinction between resident and non-resident birds. British officers could thus use the situation of Hong Kong as a sentinel post to observe the diversity of birds flying through the East-Asian coasts.

The analogy between birds migrating to Hong Kong and Chinese refugees is striking. It was clearly made by Sir John Chapple, Commander of British Forces in Hong Kong and a friend of Governor Edward Youde, himself a passionate birdwatcher. He was in charge of surveillance of the Mai Po marshes at the end of the Pearl River Delta. He stressed the continuity between military control of the border and surveillance of biodiversity: the population of humans and non-humans in Hong Kong was regarded as threatened by all kinds of illegal behaviour from the other side of the border:

> Military control meant control over access; military patrols seeking out illegal immigrants (which was the new classification of refugees) meant a constant oversight over the whole area, and this in turn helped to end illegal trapping inside the fence; better controlled road access allowed for useful environmental studies and also made easier the construction of board walks and hides. [26]

The Mai Po marshes were turned into a nature reserve when the government granted its management to the World Wildlife Fund in 1984. The WWF

20. One of them was Noritaka Ichida, who worked for the Wild Bird Society of Japan and BirdLife Asia, launched a series of bird books for Asian countries, and was instrumental in the success of the Black-faced Spoonbill international collaboration.
21. The main reference for birdwatchers is Mark Brazil, *Birds of East Asia*, Princeton, Princeton University Press, 2009. It follows the model set up by Roger Peterson for the US in the 1930s, in which birds of the same species are represented on the same page.
22. Interview in Taichung, 16 October 2012.
23. On the influence of Japan in the training of park managers in Taiwan, see Weller, *op. cit.*, pp. 74-76.
24. Mark B. Wilkie, "A Brief History of Grey-Faced Buzzard Conservation in Taiwan," www.birdingintaiwan.com/gray-facedbuzzard.htm (accessed on 5 March 2015). Mark Wilkie, a South African birdwatcher living in Yunlin County, made a film on the Grey-faced Buzzard with *National Geographic* in 2007-2008. He said he "used Grey-faced Buzzards as a Trojan horse for conservation movements" (interview in Huben, 4 October 2012).
25. Robert Weller, *op. cit.*, p. 56. See also p. 70.
26. "Letter from Field Marshal Sir John Chapple," *HKBWS Bulletin*, No. 207, 2008, p. 7.

had been created in 1961 at the IUCN headquarters in Switzerland with a global action toward protection and conservation of wildlife. Prince Philip was appointed president of the British branch, and its Hong Kong branch was created in 1981. Mai Po became a "Wetland of International Importance" under the Ramsar Convention [27] in 1995. The first manager of the reserve, David Melville, had held the post of Government Ornithologist between 1974 and 1980.

The WWF transformed a site for harvesting shrimp and fish into a nature reserve by hiring former fishermen and training them to the techniques of conservation. This reserve consists of former shrimp ponds (in Cantonese: *geiwai* 基圍) that used to be drained every day to collect shrimp for the market. A system of dams regulates the tide in such a way that shrimp become visible to birds that come roost on the reserve. Fishermen had to learn to use these dams for the sake of birds and not for their own purposes. They were enlisted in the fight for conservation, which produces some tension with other fishermen who have kept their production for the market. Every year, the WWF organises a harvest ceremony in which their staff and local fishermen are invited to share a meal of shrimps that have just been harvested from the ponds.

Since 1984, the World Wildlife Fund has also organised a bird race at the end of winter. Teams scattered all over the territory compete to see as many birds as possible in one day, usually starting with the forest birds of Tai Po Kau and ending with shore birds at Mai Po. In contrast with the bird races of Taiwan, which are sponsored by the Tourism Bureau of the national government, bird races in Hong Kong are sponsored by private donors. Groups of birdwatchers wear the colours of their sponsors, who donate money for conservation based on the reputation of these groups. Strong methods of communication are used to promote the race.

The WWF played an incremental role in enlarging the practice of military officers to a larger audience. They could use the specific ecology of Hong Kong as a site of imperial entrance into South China, playing on the networks of actors in the territory. However, they were often in tension with local people, such as fishermen whose practices were transformed by conservation. An incident reveals these tensions between the WWF and the Hong Kong population at large. After the emergence of avian influenza in 1997, the Hong Kong government decided to close the Mai Po reserve whenever a wild bird infected with influenza was found within a perimeter of three kilometres around the reserve, since the reserve was owned by the government but run by the WWF. This decision followed the complaints of fishermen about the increase in birds due to the interruption of fishing practices. They asked: why protect birds if they bring viruses to humans? But this decision also shows that birdwatchers are a weaker pressure group than the poultry industry, which is considered the biggest reservoir for the mutation and spread of avian influenza viruses. A British member of the HKBWS thus said:

> Mai Po is probably the most tested place in the world for wild birds, and no wild birds have been found with the disease. I know that one or two dead birds have been found in the area. But in terms of the claim that it's migratory birds that are spreading death to humans, it's nonsense. My frustration is that so little research has been done in the wild bird trade. But the fact is that birds are an easy way for the government to lay the blame elsewhere. If you say "shoot the birds," you have to contend with a few green groups. If you say "close down the poultry farms," you have to contend with the global agricultural industry. [28]

Photo 2 – A birdwatching tour in the wetland reserve of Mai Po. © Frédéric Keck

To alleviate a decision perceived as unfair (particularly since no avian influenza virus transmittable to humans has been found on the reserve), the WWF has argued that Mai Po is the most investigated place in Hong Kong for biodiversity, and proposed that the government uses the knowledge of local birdwatchers to monitor avian influenza all over the territory. Counting the cases of avian influenza reveals modes of transmission across the border in continuity with the politics of imperial surveillance. The concern of a military elite for the security of a territory thus includes a larger enrolment of birdwatchers in biosecurity concerns.

How has the democratisation of birdwatching societies transformed these links between biosecurity and biodiversity that constitute them as "sentinels"? Has it been successful in developing a critical perspective on the environment that is not commanded by the government from above? [29] How has it changed birdwatching practices such as bird books and bird races?

The democratisation of birdwatching societies

Birdwatching practices are among the most widely shared relations to the environment in industrial societies, given the diversity of bird species and the numerous possibilities to see them on shores, in forests, or even in urban environments. In Great Britain, the Royal Society for the Protection of Birds, created in 1889, is the biggest environmental association, with one million members. In the US, the National Audubon Society, created in 1905, has around 600,000 members. After an introductory period through Western military practices of surveillance, we will now see how this form has also been democratised in Taiwan and Hong Kong. It remains to be seen how the expansion and indigenisation of birdwatching changes their practices and modes of organisation.

27. The Ramsar Convention is an international treaty signed in 1971 to preserve wetland areas with ecological, economic, recreational, and scientific value. Hong Kong signed this convention in 1979, and China in1992. There are currently 30 Ramsar sites in China.
28. Mike Kilburn. Interview in Hong Kong, 25 September 2007.
29. I take the notions of "above" and "below" from the analysis of Weller, who quotes the Chinese saying: "there are policies from above and counter-measures from below" (*shang you zhengce, xia you duice*) (*op. cit.*, p. 138).

A demographic expansion

In Taiwan, the lifting of martial law in 1987 meant not only the possibility of organising birdwatching activities publicly but also a growing desire for enjoying leisure outside working hours. The number of societies increased to 19, which formed a federation (originally named the Chinese Wild Bird Society) that currently claims 5,000 members. Each society has at least six representatives for the election of the president of the federation, organised every two years. As sociologist Michael Hsiao observes: "The Bird Society was originally organized by people who enjoy birdwatching. By the 1990s, the Society developed into one of Taiwan's biggest environmental organisations, with more than a dozen local chapters islandwide. This formerly apolitical organisation was gradually drawn into political activism because of the increased destruction of Taiwan's natural environment, which sharply contradicted the Society's fundamental beliefs." [30] The organisation of a federation helped to coordinate local initiatives for the protection of bird environments in the face of a growing construction industry.

Lucia Liu Severinghaus, who was one of the founders of the Taipei Wild Bird Society, recalls that the first groups of birdwatchers had to gather in private places. The creation of national parks, the legalisation of public meetings, and the formation of a wealthy middle class led to the expansion of the movement:

> The first meetings were in the homes of one Westerner, and usually there were a dozen Western people, two or three Chinese from what I can remember, and mostly Westerners. By the end of the 1970s, there were almost no Westerners, it was entirely Chinese. I was in the States for my degree, but my husband came back to work in Taiwan in 1980. When he joined the Taipei bird society outings, he was the only Westerner, the others were all local Chinese. And it was difficult in those days: private cars were rare, binoculars were rare, people gathered and they took buses to wherever they were going, and they shared the few pairs of binoculars. In terms of birdwatching, those were really hard days. And then the movement rapidly grew. [31]

A consequence of the indigenisation of birdwatching in Taiwan was the focus on "endemic species." The motivation was to attract tourists to Taiwanese sites where unique species could be observed, but also to affirm the specificity of Taiwan as an ecosystem by contrast with mainland China. It can also be traced to the American model, where ornithologists criticised birdwatchers as "feather splitters" in the 1890s because they created too many subspecies to defend their localities. [32] Zoologists often compare Taiwan to the Galapagos to explain the diversity of animal species on the island. An Endemic Species Research Institute created in 1992 in Yunlin County under the jurisdiction of the Council of Agriculture showed that Taiwan had 24 endemic species of birds. The use of molecular sequencing of blood samples or feathers supplements ocular observation when two species look similar in mainland China and in Taiwan. An example is the distinction between the Chinese Bulbul and the Taiwan Bulbul. In the nineteenth century, naturalists assumed they were two separate species that had recently diverged, but the increasing hybridisation between Chinese Bulbuls and Taiwan Bulbuls (particularly as Chinese Bulbuls are imported to Taiwan for spiritual release) tends to blur that distinction. Since molecular sequencing has not confirmed the divergence, the Taiwan Bulbul has been declared a "subspecies." As the number of Taiwanese birdwatchers grew, this kind of controversy aroused increasing discussion.

Similarly, after the 1997 handover of Hong Kong to China, the number of Chinese members of the HKBWS surpassed that of expatriates, increasing to 1,500 members. This makes it the biggest environmental association in Hong Kong. The chair of the society was given to Chiu Ying Lam, then head of the Hong Kong Observatory. After taking courses in 1976 on "Birds of Hong Kong" with Mike Webster, then chairman of the HKBWS, he became the first Chinese member of the Society. Under his leadership, the first "Bulletin of the HKBWS" was published in Chinese, and information about bird lists and bird races, which until then only interested a colonial elite, was expanded to more general consideration of Hong Kong's environment. Chiu Ying Lam recalls how the military spirit of discipline and equipment was turned into a more casual and democratic atmosphere:

> Before, they assumed that everyone had a car; I started running coach trips to Mai Po for members. Before, they thought birdwatchers should arrive at sunrise; I wanted the coach trip to start at 8am. So we had more common people. [33]

The side effect of such an expansion was that birdwatching societies became closer to an association of amateurs than to a club of specialists. Amateurs were attracted by the possibility of taking and sharing nice pictures of birds with fancy cameras rather than by the challenge of acquiring knowledge for identification of bird species using guidebooks. While the HKBWS published *Avifauna of Hong Kong* in 2001 using all the records of the society since its creation in 1957, [34] most newly-arrived birdwatchers use the website of the society to find and post knowledge and images about bird species on the territory. The HKBWS website hosts these pictures, but asks their members to specify the name and location of the observed bird. Another website set up by a former member of the HKBWS, "Hong Kong Wildlife," hosts pictures on all kinds of animals and plants without mentioning a location. A debate has been raging on the value of amateurs' pictures for birdwatching societies. If they provide information on the location, amateurs' photos of "first-seen" birds may help more specialised birdwatchers build statistics. They also indicate a sense of attachment to a location that may be missed by more statistically-oriented birdwatchers. Ruy Barretto, a lawyer and member of HKBWS, thus argues:

> Birdwatchers can contribute to conservation because they are mobile, well-off, articulate. They can make proposals and protest. If there's a conservation damage, they can photograph that. Amateurism is not bad; there is immaturity and enthusiasm, but it can provide the records from which you get the statistics and the numbers. [35]

The same problem was addressed in Taiwan through the notion of "citizen science." Particularly promoted by the Department of Ornithology at the University of Cornell, it is an attempt to increase the knowledge produced

30. Hsinh-Huang Michael Hsiao, "Environmental Movements in Taiwan," in Yok-Shiu Lee and Alvin Y. So (eds), *Asia's environmental movements: Comparative perspectives*, Armonk, New York, M.E. Sharpe, 1999, p. 36.
31. Interview in Taipei, 30 April 2013.
32. See Mark Barrow, *A Passion for Birds*, *op. cit.*
33. Interview in Hong Kong, 8 December 2008.
34. Geoff Carey et al., *The Avifauna of Hong Kong*, Hong Kong, Hong Kong Birdwatching Society, 2001.
35. Interview in Hong Kong, 14 July 2011.

by scientists on biodiversity through the passion and local engagement of amateurs. This has been more heavily systematised in Taiwan through the Breeding Bird Survey, which hires 260 volunteers every year for training in bird identification. Lucia Liu Severinghaus, who was active in setting it up, admits that this project is not attractive to amateurs because it is aimed at counting common birds in an exhaustive way by mapping the territory: "They prefer to have a beautiful photograph of a rare bird. But to have citizen science, to build up a base of knowledge, common birds are as important, and places hard to get to are as important." [36]

The most popular event for Taiwanese birdwatchers is the bird fair every year in Guandu Nature Park, which attracts around 10,000 people in October. This park, situated on the sides of the Tamsui River in the suburbs of Taipei, is run by the Wild Bird Society of Taipei for the education of birdwatchers and the conservation of birds (particularly shorebirds: egrets, herons…). The creation of this park was the result of 15 years of environmental mobilisation. [37] During the bird fair, binoculars and bird books are sold, as well as kits to save and nurture young birds. Shows are performed with actors in bird costumes before the society's president and the tourism bureau's head give speeches.

The real democratisation process started, however, with environmental movements that occurred simultaneously in the year 2000 in Hong Kong and Taiwan. These movements were opportunities for birdwatching societies to exchange information and competence despite their historical differences, and to strengthen their roles as sentinels. This was a turning point, as it defined birdwatching societies less by the conservation policies of governments, and more by their involvement in international networks.

Mobilisations for "flagship species"

The HKBWS became popular as an environmental movement when it engaged in the protection of the area of Long Valley in the northern New Territories. This agricultural wetland was threatened by plans of the Kowloon-Canton Railway to construct a rail line. The HKBWS showed that Long Valley was home to more than 210 bird species, many of which had disappeared from similar habitats on the other side of the border with mainland China. They launched a public campaign between 1999 and 2001, and secured the diversion of the railway into an underground tunnel that did not affect the habitat. Chiu Ying Lam recalls:

> At that time, we had virtually no chance of winning since we were fighting the railway company, which was rich and powerful. We were also labelled as "a tiny group of bird-watchers." But birdwatchers did whatever they could: some wrote letters, some offered ideas, some helped linking up with fellow NGOs and the media, some took legal actions, etc. [38]

It was a formative experience for the HKBWS in communicating with the public. Information about Long Valley appeared several times on the front page of the *South China Morning Post*. Experts from BirdLife International [39] came to Hong Kong to examine the Environmental Impact Assessment process. They showed that the conservation value of the wetland had been played down. Mike Kilburn, an active member of the HKBWS Conservation Committee, wrote an article about Long Valley in the journal of BirdLife International, *World Bird Watch*, in 2000. [40] As an expert in public relations, Mike Kilburn wanted to provide the general public with information that he believed the Hong Kong government had concealed.

Photo 3 – A meeting of the Taipei Bird Club to see vultures at Guanyinshan. © Frédéric Keck

In the same issue of *World Bird Watch*, an article was published on a similar mobilisation taking place in Taiwan at the same time. The villagers of Huben in Yunlin County were fighting a gravel extraction project. They told the Chinese Wild Bird Society that the site of Hushan was home to the Fairy Pitta (*Pitta nympha*), a colourful migratory bird considered as an endemic species in Taiwan. The Fairy Pitta was taken by environmental associations as a flagship species to lift the movement. They sent almost six million emails to foreign correspondents to attract attention to the Fairy Pitta's habitat. An international petition entitled "Save the pittas' home – stop the gravel extraction" collected more than 10,000 signatures, including 95% of the villagers of Huben. Mike Kilburn contacted Taiwanese birdwatchers through BirdLife International and advised them on how to publicise the movement.

This environmental movement was relayed at the governmental level. The Council of Agriculture carried out a survey of the breeding population of Fairy Pittas, and estimated a population of 40 in the area. On 14 June 2000, newly elected President Chen Shui-bian declared: "Taiwan is a beautiful island and gives due consideration to both conservation of the natural environment and industrial development. People living in harmony with nature means that the environment will be healthy and will last forever. If Taiwan lost the Fairy Pitta, we would not only lose the most beautiful thing in Taiwan, but the whole world would be a poorer place." Consequently, Huben

36. Interview in Taipei, 30 April 2013.
37. The creation of this park in 1996 was the first success of the Wild Bird Society of Taipei, following a ten-year campaign in public opinion and political circles: see Shui-Yan Tang and Ching-Ping Tang, "Democratization and the Environment: Entrepreneurial Politics and Interest Representation in Taiwan," *The China Quarterly*, No. 158, 1999, pp. 350-366.
38. Chiu Ying Lam, "Thirty years with the HKBWS," *HKBWS Bulletin*, No. 207, 2008, p. 11.
39. BirdLife International is an NGO created in 1922 by American and French ornithologists Thomas Gilbert Pearson and Jean Delacour under the name *International Council for Bird Preservation*. It changed its name in 1993 to coordinate more than 120 birdwatching societies in the world. The Hong Kong Birdwatching Society joined this network in 1994, and the Chinese Wild Bird Society joined in 1996.
40. Mike Kilburn, "Railway development threatens Long Valley," *World Bird Watch*, Vol. 22, No. 3, 2000, p. 8. See also Robert Allison, "An object lesson in balancing business and nature in Hong Kong: Saving the birds of Long Valley," in Lene Bomann-Larsen and Oddny Wiggen (eds), *Responsibility in World Business: Managing Harmful Side-effects of Corporate Activity*, United Nations, 2004, pp. 121-137.

Village was designated an Important Bird Area (IBA) by Birdlife International, and as an ecological village by the ROC government. [41]

During the Presidency of Chen Shui-bian, leader of the Democratic Progressive Party, between 2000 and 2008, the Chinese Wild Bird Society became the Wild Bird Federation of Taiwan, with Simon Liao as its president. But it then returned to Chinese Wild Bird Federation in 2008, while other members kept the name Wild Bird Federation of Taiwan. The indigenisation of birdwatching societies was contested, particularly when it involved fighting with local villagers against a construction project. It may be considered that the year 2000 marked a climax in the democratic engagement of birdwatchers, followed by a period of backlash. The president of the Federation from 2011 to 2013, Charles Cheng, professor at Kaohsiung Medical University, thus presents a consensual image of the society: "We are not like ordinary environmental groups. We don't go easily in the streets. We advocate in a reasonable way, because we are educated people." [42]

In Huben village, birdwatchers had to fight the interest of landowners, who, some claim, threw firecrackers in the woods containing pitta nests to frighten them. In preparation for the proposed construction of a new dam, the Environmental Protection Agency published two reports in 2002 and 2008. The first report recommended stringent construction standards and funding for long-term research on the Fairy Pitta; the second report showed the impact of the project on the Fairy Pitta population, rare endemic plants, geological fragility, and climate. The NGO Wild at Heart, founded by Robin Winkler, an American lawyer who came to Taiwan in 1977 and obtained ROC nationality in 2003, was involved in the Environmental Impact Assessment (EIA). However, its recommendations were not followed, and construction of the dam was authorised.

Meanwhile, studies led by Scott Lin at the Institute of Endemic Species showed that the Fairy Pitta was spread all over Taiwan, and not only around Huben. Although the number of Fairy Pittas is considered to be declining, this decline is attributed to the deforestation of Borneo, where they spend the winter – an island lacking in records and conservation policies. From being a flagship species in a local mobilisation, the Fairy Pitta became an object of knowledge of global migratory flows, which reduced the urgency of its conservation. In other words, it failed to be turned into a sentinel collective.

The protection of birdwatchers in the area of Long Valley was more sustainable. Long Valley is monitored by the HKBWS for its biodiversity, but it is still owned by private landlords and remains threatened by development projects. The HKBWS asked its members to visit Long Valley and send pictures of birds to the government as a testimony to its conservation value. [43] The comparison between Long Valley and Huben Village is telling. While Huben villagers found an emblematic species to attract birdwatchers, the expert knowledge of ornithology led to the decline of the movement in a long juridical process. By contrast, in Long Valley, birdwatchers supported the conservation value of the area as a whole without much reference to villagers, and gained the support of the government to monitor the biodiversity of the area. This shows the fragility of "flagship species": if it is linked to a conservation movement and a local movement to raise alert and awareness, dependence on a single species can lead to the decline of the movement because it can be extracted from the rest of the environment.

By contrast, the Wild Bird Society of Kaohsiung was more successful in attracting local people to the protection of a local species, the Pheasant-tailed Jacana (*Hydrophasianus chirurgus*), [44] which became a "flagship species." The number of these birds had declined to 50 due to construction of the High Speed Railway, which opened in 2007. The government consequently asked the developer to buy and preserve land in compensation, and proposed that the WBS run this conservation project. Birdwatchers go to the field to see if nests are hatched, and ask farmers to stop their activities during the breeding season. Farmers who agree to protect the birds receive an "eco-friendly" label (useful for attracting "eco-tourists") and compensation (between NT$5,000 and 10,000, or 120 and 240 euros). Villagers have an incentive to engage in the conservation movement, even if the territory has not received the status of a National Park. The population of these birds consequently increased to 300 in 2012. Education programs are run in schools so that children recognise protected species. This movement can be compared with the long-term engagement of the HKBWS in Long Valley, even if it was not as conflictual as the movements in Long Valley and Huben.

Democratic sentinels?

What is the difference, we asked, between a sentinel and a flagship species? While the flagship species is the object of a collective mobilisation, marked by an increase in the number of participants, the sentinel involves a border that must be protected against a threat. New forms of sentinels have developed that include more local participants than the previous military forms, as borders have taken new significance in a connected world.

Protection of the Black-faced Spoonbill (*Platalea Minor*) joined Hong Kong and Taiwan in the organisation of such a sentinel. In the 1990s, Hong Kong birdwatchers showed that the number of these migratory shorebirds had declined to 300, which led to their classification as an endangered species. They equipped Black-faced Spoonbills with satellite trackers, which revealed that these birds breed in the demilitarised zone between North and South Korea and migrate to the South China Sea in the winter. One of their feeding grounds is a wetland on the shores of the Qigu River north of Tainan: around half of them stop there in the winter, and a quarter in the Hong Kong reserve of Mai Po. In winter 2002-2003, 73 Black-faced Spoonbills were found dead with botulism, and drills were organised, using decoy birds, to conduct a non-harmful immunisation of the remaining spoonbills. [45] These drills served as a model for the definition of a nature reserve. As the Qigu area was threatened by all kinds of development projects (recreational area, steel mill, airport, etc.), the WBFT joined a movement for its protection. With the support of local authorities, they obtained the creation of Taijiang National Park in 2009. Lucia Liu Severinghaus recalls:

> NGOs and academics and conservationists and local government officials all came together and fought against these development projects. We requested that a conservation area be set aside, large enough for all the requirements of the birds. In 2002, the national government only approved 634 hectares; it was not large enough to

41. Michelle Huang, "Saving Pillow Mountain, Taiwan," *World Bird Watch*, Vol. 22, No. 3, 2000, pp. 10-11. See also Shui-Yan Tang and Ching-Ping Tang, "Local governance and environmental conservation: Gravel politics and the preservation of an endangered bird species in Taiwan," *Environment and Planning A*, Vol. 36, No. 1, 2004, pp. 173-189.
42. Interview in Taichung, 24 April 2013.
43. www.hkbws.org.hk/BBS/viewthread.php?tid=10197&extra=page%3D4 (accessed on 5 March 2015).
44. Interview with Lin Kung Hai in Kaohsiung, 29 April 2013.
45. Such drills are also used for humans to prepare them for an impending infectious disease: see A. Lakoff, "The Generic Biothreat, or, How We Became Unprepared," *Cultural Anthropology*, Vol. 23, No. 3, 2008, pp. 399-428.

> contain all the activities of the birds. But then the local government officials initiated Taijiang National Park. This park was set up very differently from other national parks. From an environmental awakening or civil movement point of view, Taijiang National Park is unique. It was the mayor of Tainan who went around spending several years, talking to different sectors of the local community, trying to convince people, then proposed the park in 2009. This park offered great protection for Black-faced Spoonbills, but there are still difficulties because some of their habitats are still privately owned. If a person didn't want his land to be included in the park, it was not included. So if you look at a map of the park, it has a very strange shape. It is not a park with a neat boundary. All the private areas are excluded.[46]

The park still has many fish ponds run by private fishermen, but most of these ponds are not active. The Satellite Tracking Program continues in Taijiang National Park, with six Black-faced Spoonbills caught and equipped with satellite tags in winter 2012-2013.[47] A bird with a satellite tag is more than a flagship species: it becomes part of the human collective as it is equipped to send warning signals of extinction. A parallel may be drawn with the banded birds of the MAPS program or the birds infected with avian influenza: bird diseases can be seen as opportunities for birdwatchers to pass alliances beyond the opposition between the national government and local inhabitants, with other forms of expert knowledge. When birds are described as sick, the threat of their extinction appears more urgent than if they suffer from other environmental changes. This threat produces emotional identification in the public, and the need for collaboration between experts in human and animal health. The monitoring of biodiversity can thus be modelled on the surveillance of diseases in wild birds.

By contrast, it is interesting to describe the failure of a sentinel collective in Kinmen, where the military position of a sentinel was not transformed into a democratic movement for the protection of the environment. Kinmen is an island on the shores of the Chinese sea, very close to Xiamen, which remained a property of the Republic of China and became the site of several fights between the two Chinas. The Wild Bird Society of Kinmen has started a petition arguing that the construction of a highway would destroy the rich biodiversity of the island, preserved by half-a-century of military presence. They gained the support of the Wild Bird Society of Xiamen, which showed that with the same ecosystem and a higher level of development, many species found in Kinmen had disappeared from Xiamen. But local inhabitants support the construction project, and the Wild Bird Society has not found a "flagship species" that would crystallise the movement for the Taiwanese public. Kinmen birdwatchers defend the natural and cultural environment of the whole island – old houses from South Asian merchants – rather than a natural site.

According to some birdwatchers in Taipei, the reluctance of Kinmen inhabitants to be a site for nature conservation comes from their past as the "frontier" and "battleground" between Taiwan and the People's Republic of China. It is precisely because it was a site of military simulations that it could now become an experimental place for nature conservation, as the territory has been preserved from development. But relations with China have changed the local economy: Kinmen inhabitants now make profit from their vineyards and receive governmental subsidies, after being "sacrificed" during the Cold War. The military sentinel of Kinmen did not turn into an environmental sentinel, because birdwatchers were not followed by local inhabitants or national authorities in their conservation project. It would have been possible for Kinmen residents to fight against the construction project by arguing that it was a threat coming from mainland China, but this argument did not arise.

However, despite the failure of the movement to protest the construction of the highway, Kinmen has become a major site for tourists, particularly birdwatchers from mainland China who enjoy the preservation of the site in contrast with the same landscape on the other side of the border. This may be another version of a democratic sentinel: the formation of an awareness of environmental issues in a newly mobile Chinese elite. The head of the HKBWS after 1997, Chiu Ying Lam, thus promoted the teaching of conservation in mainland China. He organised a symposium in Chengdu in 2006 where birdwatching societies could exchange views on management issues. After this symposium, China Bird Net was created as a network between birdwatching societies in China. While the first international bird races organised in China in the 1990s (one of them in Beidaihe) attracted mostly foreigners, in December 2002, the section of the WWF for China organised a bird race in Dongting Lake Reserve that successfully engaged Chinese birdwatchers.[48] This expansion of birdwatching societies raises the same issues as their democratisation in Hong Kong and Taiwan, particularly as bird photographs are highly popular and the teaching of environmental knowledge is unsystematic. In China, no popular bird book was published before *A Field-Guide to the Birds of China*, co-authored by John MacKinnon and He Fenqi in 2000.

Conclusion

As the development of the Chinese economy brings more amateurs to birdwatching practices and at the same time threatens the habitat of birds, Taiwan and Hong Kong play the role of vanguards and sentinels for China, since they connect a passion for birds with protection of the environment, following a Western model that became indigenised. This article has shown a plurality of ways to raise environmental consciousness, starting with the passionate observation of bird "flagship" species.

A first diversity lies in the historical models for organising birdwatching societies. The comparison between Taiwan and Hong Kong shows that US and British models differ in the way they map a territory and give meaning to the decline of the numbers in a bird species. While the US model (reinforced by the Japanese protection of nature) encourages the development of natural parks where the habitat of birds is preserved and biodiversity is valued, the British model insists more on the preservation of feeding sites for migratory birds. This may be one of the reasons for the emphasis in Taiwan on subspecies or endemic species and in Hong Kong on lists of birds – added to the difference between an island separated from the continent and a territory at the end of a river delta. The perception of a "first-see" or "rare species" depends on the way common birds are defined, and the quest for rare birds is a main motivation for their preservation. Colonial heritage as well as ecology of the territories both have a role in the divergence between Hong Kong and Taiwan birdwatching activities.

46. Interview in Taipei, 30 April 2013.
47. On the history of procedures for satellite tracking, see Etienne Benson, *Wired Wilderness: Technologies of Tracking and the Making of Modern Wildlife*, Baltimore, Johns Hopkins University Press, 2010.
48. See Han Lianxian, "The development of birdwatching societies in Mainland China," *HKBWS Bulletin*, No. 205, 2007, pp. 2-7.

Second, diversity arises from the assemblages of actors under a bird species considered rare or endangered. Local inhabitants, conservationists, microbiologists, and local and national authorities can intervene at different stages in the construction of a public problem through the impact of a development project on a bird species. These actors are aware that some birds become a "flagship species" for environmental problems that far outweigh their actual number, but there is an aesthetic moment in the use of a bird species that crystallises various interests. The problem is therefore how to make these various engagements sustainable, for instance by creating programs for monitoring health or biodiversity in a protected area. Environmental threats affecting birds have the potential to provide alerts on more general environmental issues. Diseases such as botulism or influenza have a strong emotional potential because the decline of the number of birds turns into actual massive deaths of birds, similar to the fear of a pandemic. But these mobilisations can also appear as a diversion: wild birds can be blamed for diseases that mostly affect domestic poultry, and raise issues of trade controls rather than conservation.

Finally, there are diverse ways to connect passionate engagement in birdwatching and production of knowledge in a community. The publication of bird books and websites is a defining moment in the life of birdwatching societies. Meetings such as bird races or bird counts entertain conflicting values of collaboration and competition in ways that are attractive to birdwatchers. If the social life of birdwatching is close to that of hunting societies, it aims at a collective production of knowledge through the suspension of the desire to catch and conquer natural kinds. This article has shown that the military model of organisation of birdwatching societies borrowed from colonial governmentality – high level of visual equipment, focus on collective threats, monitoring of a territory – have been transformed by a civic defence of the habitat in environmental movements. The digitalisation of knowledge – photographs can be downloaded immediately on a website and commented upon – increases the number of people who can access this knowledge, but also opens spaces for the expression of attachment to a locality.

For these various reasons, birdwatchers in Hong Kong and Taiwan can be considered sentinels of environmental change in China. They look at natural phenomena occurring on the borders of China, in spaces that have rich natural and cultural value. They produce data and numbers in such a way that local attachments can be transformed, through consultation and exchange, into a general knowledge about the ecology of the South China Sea. Yet this analysis has also shown how environmental movements around bird species can fail to constitute sentinel collectives in a sustainable way, either because they come from above, or because the link between local mobilisation and international networks of knowledge is missed, or because a "military post of surveillance" such as Kinmen is not converted into an environmental watching site. These failures are indicators of the potential impact of birdwatching activities as they expand from Hong Kong and Taiwan to the rest of China. They also show that the protection of natural parks, such as Guandu, Tainan, and Mai Po, is not sufficient to guarantee a successful globalisation of Western practices of nature conservation. Environmental movements involve much more local participation and knowledge production than the definition of an enclosed area for wilderness. They entail the formation of long-term relationships between humans and birds at the borders between territories and between species. The process of democratisation of birdwatching societies as sentinels of the environment, despite their paradoxical military heritage, may be oriented toward this form.

Frédéric Keck is a researcher at the Laboratoire d'anthropologie sociale, and the head of the research department of the Musée du Quai Branly, Paris.
Musée du Quai Branly, 222 rue de l'Université, 75343 Paris Cedex 07 (frederic.keck@quaibranly.fr).