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Contents

Preface 6

The Forces that Shape Japan
Wild Japan in Context 9
Along the Arc of Fire 18
The Story Begins with the Landscape 33
Oceans, Seas and Currents 38
Climate 41

Natural Ecology
The Habitats of Japan 57
The Flora and Vegetation of Japan 77
Japan's Biodiversity 89
Patterns of Wildlife Distribution 97

People and Wildlife
Islands and Extinction 123
Conservation Successes 127
Wildlife-watching 133

The Regions of Japan
Hokkaidō – Land of Ice and Snow 149
Honshū – The Heart of Japan 209
The Sky Islands at the Heart of Honshū 237
Southern Lands – Kyūshū and Shikoku 273
Northern Nansei Shotō 299
Southern Nansei Shotō 315
The Natural Marvels of the Izu, Ogasawara and Iwō Islands 333

Mammals and Birds of Japan
An Overview of Japan's Mammals 352
An Overview of Japan's Birds 356

Bibliography and Recommended Reading 362

Acknowledgements 366

Index 368

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The Forces that Shape the Land

Wild Japan in Context

On a global scale, the Japanese archipelago may seem a small and inconsequential group of islands situated in the northwest Pacific when compared with the immense scale of the Eurasian continent to its west. Islands, however, are invariably fascinating. The Japanese archipelago spans 3,000 km from northeast to southwest, encompasses more than 6,000 islands, and contains such a wide range of habitats, from subarctic and alpine to subtropical as well as from high mountain tops to great ocean depths, that its biodiversity[1] is astonishing, as is its underlying geodiversity[2]. The long isolation of many of the islands in the archipelago has resulted in the evolution of local forms and species of plants and animals. This, combined with the extraordinary contrasts in climate, fauna and flora found between the almost subarctic north and the subtropical south, results in the fascinating natural diversity of the Japanese archipelago.

Images of Japan as a tiny, crowded island nation, although largely promulgated by the Japanese themselves, are clichéd and misleading. In fact, Japan is larger than either Britain or New Zealand and is larger than most countries in Europe except Spain, and almost exactly equal in size to Germany.

To grasp the scope of Japan's wildlife diversity requires an understanding of the scale of the country itself, of the fabric of the land, its underlying geology, its geography, and its location and climate. The early sections of this book deal with these topics, while the main chapters focus on each region and the special wildlife to be found there.

Common images of Japan involve shiny cars, the latest electronic goods, and regimented ranks of commuters in business suits. Japan is, after all, an intensely developed country with a population of 126·71 million (2017)[3]. The Japanese people's belief in their racial and social homogeneity is an interesting one, not supported by observation. Furthermore, their self-image as 'loving nature' is a surprising one when one travels around an archipelago showing few clear signs of that 'love'. Yet, behind the façade of development, outside the bounds of the metropolitan areas, and beyond the supposed homogeneity, there is another, wilder Japan.

Japan's numerous cities are densely developed and house more than half of the population [UNSP].

Japan consists of thousands of islands, such as tiny Higashi-jima, in the Pacific Ogasawara Islands [MOEN].

1 The diversity of life forms living in a particular region or ecosystem.
2 The diversity of geological features in a particular region.
3 Declining from a peak of 127·09 million in 2015.

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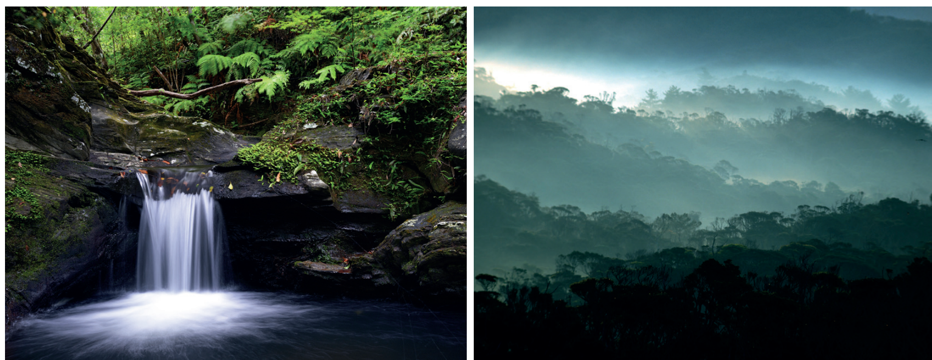

The range of habitats includes subtropical forest, such as in northern Okinawa [BOTH KuM].

Wild Japan is astonishingly diverse, and the reasons, although apparent, are little known among those who travel the standard tourist circuit of the country. Perhaps Japan's most significant feature is that it is not just an island country, but a country of islands. Furthermore, it is situated where the Oriental and the Temperate regions meet, meaning that Japan is situated at a significant natural-history crossroads.

The northern island of Hokkaidō[1] has a subarctic feel, while in the far south the Nansei Shotō, the islands that stretch between Kyūshū and Taiwan, lie within the subtropical zone. In between, there exists just about every habitat imaginable, including brackish coastal wetlands and high alpine meadows, dune forests and peat swamps, sea-ice-battered northern coasts and subtropical coral reefs. In the sand dunes of Tottori Prefecture there is even a hint of a desert landscape.

Following the geological process known as 'back-arc spreading' that separated what are now the Japanese islands from the edge of the Asian continent about 20–15 Mya, there have been numerous glacial episodes during which sea levels have fallen, as water was locked away in ice during glacial maxima, and risen, as that ice melted during interglacial periods. During past periods of lower sea levels the Japanese islands were connected to the Asian continent in three areas, via Sakhalin to the north, the Korean Peninsula to the west, and Taiwan to the south. These land bridges allowed land mammals to colonize what later became far more restricted islands as the sea levels rose once more. As a result, some of Japan's 170 or so mammal species, the Asiatic Black Bear and Eurasian Red Squirrel for example, are widespread across Asia, while others, including the Japanese Dormouse and Japanese Serow, are specific to these islands. Similar patterns are to be found here among most terrestrial groups of organisms.

Islands isolated for long periods are crucibles for the evolution of new species, and Japan's thousands of islands therefore support a fascinating mix of widespread Eurasian species and many more Asian species, along with numerous local endemic plants and animals. Many species, such as the evergreen tree Itaji Chinkapin, survived the last major glacial period (the Last Glacial Maximum, or 'LGM', was 21,000–18,000 years ago) in various refugia here, leaving Japan today with a fauna and flora that has both an ancient history and a modern diversity, reflecting a series of colonizations between ice ages.

Ancient Japanese people referred to their homeland as *Akitsu Shima*, a name that means 'Islands of the Dragonflies'. Quite rightly so, because not only is Japan recognized as an important centre of diversification of Odonata but, moreover, dragonflies and their cousins, the damselflies, are so common all summer and autumn long as to be among the most familiar and popular insects in the country; they are even commemorated in popular song and are regarded as deeply symbolic of autumn.

1 Previously Ezo (a word that appears in many Japanese species names), but named Hokkaidō, meaning the North Sea Road, in 1869 and formally adopted in 1910.

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Major biomes and biogeographical divisions of Japan

Key

- Alpine
- Subarctic
- Cool Temperate
- Temperate
- Warm Temperate
- Subtropical

Blakiston's Line

NANSEI SHOTŌ

Watase's Line

Hachisuka's Line

NANSEI SHOTŌ

Iwō and Ogasawara Islands (Subtropical)

Dragonflies, such as this Foot-tipped Darter, are abundant in Japan in autumn [TaM].

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Kämpfer, Thunberg, Siebold and Blakiston – Famous Names in Japanese Natural History

Wander through the pages of any Japanese natural-history volume and you will notice that the majority of names, whether English, Japanese or scientific, refer to the unique distinguishing characteristics of a species, perhaps its colour, voice, morphology, habitat or behaviour, or something else that is striking. This is the fascinating (to naturalists, at least) realm of taxonomic etymology.

In some cases the names of people appear in species' names. Some such names are given to honour individuals, perhaps referencing a sponsor, a mentor or a famous figure. Such is the case with the gecko *Homonota darwinii*, named after the great British naturalist Charles Darwin; the rare butterfly *Euptychia attenboroughi*, named in 2017 after Sir David Attenborough; and the particularly golden-haired horsefly *Scaptia beyonceae*, recently named after the singer and dancer Beyoncé. Bob Marley, J. R. R. Tolkien, President Barack Obama, Frank Zappa and many, many other public figures have been recognized in this way by taxonomic biologists. Being commemorated in such naming conveys a kind of inescapable immortality. Taxonomists are human, and some of the names they have chosen are not so much in honour as in contempt of someone with whom they have crossed scientific swords. The father of modern taxonomy, the Swede Carolus Linnaeus, even stooped to damning unfortunate colleagues with negative names. For example, Linnaeus named a small, unattractive and unpleasantly sticky plant with tiny flowers *Siegesbeckia orientalis*, because Prussian botanist Johann Siegesbeck had criticized Linnaeus's revolutionary binomial naming system. Much more recently, a Canadian entomologist named a new species of North American moth *Neopalpa donaldtrumpi*, because its yellowish-white head scales were reminiscent of Donald Trump's golden pompadour, although whether in honour or as insult is not clear.

While our human lives are brief, the echoes of some resonate through the centuries as cultural memes that pass from generation to generation, perhaps never to be forgotten. The natural history of Japan is replete with examples, but four names are outstanding: Kämpfer, Thunberg, Siebold and Blakiston. These four names and their histories span four centuries, but in natural history they are immortal.

During the Tokugawa Shogunate, Japan passed through centuries of *Sakoku*, from the early 1600s to the mid-1850s. The country was essentially closed to the outside world as the shogunate controlled and regulated trade and other relationships between Japan and the outside world. Foreign nationals were barred from entering Japan, and opportunities for the exchange of knowledge between Japan and the wider world were extremely limited. Like a chink in a solid door, the tiny island of Dejima, in the bay of Nagasaki, acted as the narrowest of conduits through which knowledge and trade with the West could pass. This permitted, but highly restricted, Dutch trading enclave was confined on a tiny fan-shaped island of just 1·9 ha. Those who worked there, and their overseers, nevertheless required their own physicians. The physicians of Dejima proved to be enterprising men who imparted a vast store of

The tiny island of Dejima, Nagasaki, was a crucial trading enclave [CNMW].

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The German physician Engelbert Kämpfer [*left* CCo] and the Japanese Larch named after him [*right* MAB].

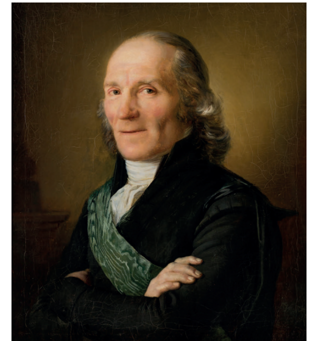
knowledge about Japan to the Western world and, conversely, introduced many aspects of Western life to Japan, not least among these being elements of Western medicine.

The first who garnered international attention was Engelbert Kämpfer (1651–1716), a German who had trained as a physician. Like so many physicians and clergymen of centuries past, he was also an ardent naturalist. His travels as a physician allowed him to collect specimens of previously undescribed species from then poorly known parts of the world, including Japan.

In September 1690, when Kämpfer arrived at Dejima, it was the only Japanese trading port open to westerners. Kämpfer was to remain in Japan for a little over two years (1690–1692) but was permitted on occasions to leave the tiny island of Dejima. It was during one of those brief excursions, to a temple in Nagasaki, that he noted and described the then poorly known and now widely planted living fossil the Ginkgo or Maidenhair Tree. At the time it was known in Europe only from fossils and was presumed long extinct. Among the many species named after him, one in particular – the Japanese Larch *Larix kaempferi* – will be familiar to anyone travelling in central or northern Honshū or in Hokkaidō. This colourful and deciduous conifer is native to subalpine slopes of Honshū, but it is a successful pioneer species thriving in open areas with dry soil and plentiful sunlight. It has been widely planted in Japan and, because of its rapid growth, it is an important forestry species. It can be seen especially in east Hokkaidō, where it is a common windbreak tree. It was named in honour of Kämpfer.

A half-century later, Dejima was once more home to a foreign naturalist who has left a significant mark. Swedish naturalist Carl Peter Thunberg (1743–1828) has been honoured as the 'Japanese Linnaeus', so great was his contribution to Japan. A student under Linnaeus at Uppsala University, Thunberg studied medicine and natural philosophy, and was therefore invited to collect botanical specimens from Dutch colonies, including the tiny Dutch enclave in Dejima.

First, as a ship's surgeon, Thunberg devoted himself to learning the Dutch language so that he could pass as a Dutch merchant (as they were the only Westerners allowed into Japan at that time). He arrived at Dejima in August 1775 and became its chief surgeon, remaining there, as had Kämpfer, for just two years. Trading his knowledge of Western medicine for permission to visit Nagasaki itself and even to travel outside the city to collect local botanical specimens, he began his exploration of Japan's flora.



Swedish naturalist Carl Peter Thunberg [GUUM]

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Thunberg was extraordinarily fortunate to have been allowed to travel from Nagasaki to Edo (Tōkyō) in 1776 as part of the Dutch representative's annual visit to the Shogun's court, and that overland journey enabled him to collect and preserve numerous plant specimens. His studies and his collections allowed him to undertake the first description of the Japanese flora, which was ultimately published as *Flora Japonica* in 1784, after his return to Sweden. His meandering return journey from Japan, from where he set out in November 1776, took him three years. On his way back to Sweden he visited London, where he met the great British botanist Sir Joseph Banks. Banks is himself commemorated in innumerable plant names, in particular the generic name *Banksia* for the many species commonly known as Australian honeysuckles. In London, Thunberg was able to examine the collection of Engelbert Kämpfer, his predecessor at Dejima, and we can imagine how thrilling an experience that must have been for him.

In the measured footsteps of Kämpfer and Thunberg came Philipp Franz Balthasar von Siebold (1796–1866), another German physician, who was destined to leave behind an astonishing legacy. Building on the works of his predecessors, Siebold's contributions to our knowledge of the Japanese flora and fauna were enormous. As with Thunberg, Siebold became a ship's doctor, learned Dutch and, like both Kämpfer and Thunberg before him, was posted to Dejima, arriving there in June 1823.

Trading his scientific and medical knowledge for information on Japan's customs, culture and natural history, at a time when, it seems, Japanese people were increasingly hungry for such knowledge, Siebold was eventually granted more extended access beyond the close confines of Dejima, even 'marrying' a local woman and fathering a daughter. He honoured his wife by naming a hydrangea, Taki's Hydrangea, after his pet name for her, and honoured his daughter with sufficient training and skills for her to become a highly regarded physician in her own right. Siebold's own collections rapidly expanded as his grateful patients 'paid' him in kind with objects ranging from ethnographic artefacts and artworks to natural-history specimens. He also sent Japanese specimen-collectors into the countryside. As was typical in that period, the specimens which he collected, including the first specimen of the huge Japanese Giant Salamander (now [NT]), were sent in shipments to various European museums.

Siebold's enquiring mind and acquisitive collecting eventually landed him in trouble, as during a journey to Edo he was caught with several maps in his possession (a treasonous act at that time). He was seized and placed under house arrest. Then, ultimately in October 1829, his six-year sojourn in Japan

Philipp Franz Balthasar von Siebold [CNMW]

Taki's Hydrangea, named for Siebold's wife [SABB].

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Japanese Giant Salamander was one of many significant specimens collected by Siebold [NBCL].

Southern Japanese Hemlock is one of many plant species named after Siebold [NZUE].

came to an end when he was expelled, having been accused of spying on behalf of Russia. Settling in the Dutch city of Leiden, he established a small private museum and wrote a number of books on Japanese ethnography, geography and natural history, as well as collections of literature and a dictionary.

I first came across Siebold's illustrious name in the context of the multi-volume *Fauna Japonica*, published from 1833 to 1850, which relied heavily on his specimen collection. It is renowned as having made the Japanese fauna the best-described non-European fauna of those times. Further serving to establish Siebold's name as one to live for ever was his work *Flora Japonica* (1835–1847), co-authored with German botanist Joseph Gerhard Zuccarini, much of which was published posthumously. Siebold's legacy lives on not only in his published works and the species named after him, but also in the species that he introduced to Europe and which have subsequently spread around the world. These include a range of species from azaleas and butterburs to the larch tree, named after his predecessor, Kämpfer. His knowledge of Japan, then closed and isolated, made him an invaluable expert and adviser, and even the American Commodore Matthew Perry, renowned for 'opening' Japan, is said to have consulted Siebold.

Little known in Europe or North America today outside the limited spheres of botany and horticulture, Siebold remains well known in Japan (as *Shiborudo*) and among naturalists, both as an important historical figure and as someone amply and eponymously commemorated in species' scientific names. These include a bird, White-bellied Green Pigeon, along with various trees and shrubs, among them Siebold's Magnolia, Siebold's Viburnum and Southern Japanese Hemlock, and a fern, Siebold's Wood Fern.

Whereas in earlier centuries the fragment of Nagasaki known as Dejima was the only conduit for knowledge exchange between Japan and the West, the second half of the 19th century, especially following the Meiji Restoration in 1868, brought the relaxation of certain restrictions. A number of other ports were opened to overseas trade, including Kōbe, Yokohama and especially Hakodate. It was to Hakodate, which had opened fully as a treaty port in 1859, that the British merchant and naturalist Thomas Wright Blakiston[1] (1832–1891) moved, initially to run his trading enterprise the West Pacific Company.

With far fewer restrictions placed on the movements of foreigners in Japan at that time, Blakiston was able, during his long, although not entirely continuous, residence in Hakodate from 1861 to 1884, to collect natural-history specimens himself, exchange specimens with others and buy specimens on offer. In collaboration with the entomologist Henry Pryer (1850–1888), who lived in Yokohama, Blakiston published a *Catalogue of the Birds of Japan*, the first work of its kind for Japan. This groundbreaking ornithological work provided the basis for a later compendious volume, *Birds of the Japanese Empire*, by Henry Seebohm, and stimulated, a century later, my own *Birds of Japan*.

1 Previously Captain Blakiston, but he resigned his army commission in 1862.

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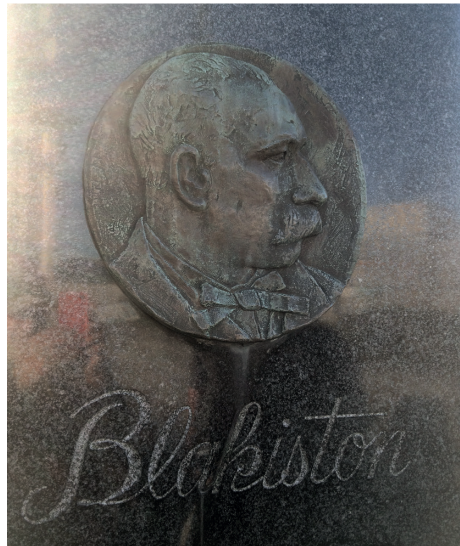
Blakiston was the first to recognize the fundamental difference between the fauna of Hokkaidō, which was more closely related to that of northern Asia, and that of Honshū, which was more closely related to the southern Asian fauna. In recognition of this insight, he is commemorated not just in the names of species, but also in the name of a globally significant biogeographical boundary.



The monument in Hakodate to British merchant and naturalist Thomas Wright Blakiston [MAB].

The fragmented crescent of islands that form the Japanese archipelago is divided by seawater channels, some deep, some with strong currents (see *p. 18–31* for a geological history of the formation of Japan). Some of those channels are so ancient as to dictate very strongly the distribution of wildlife in Japan today. One of the most important of these channels is Tsugaru Kaikyo, the strait that separates the Japanese main island of Honshū from Hokkaidō to the north.

So significant are the depth and age of the Tsugaru Kaikyo that whole suites of species are divided by it, and major distinctions between the fauna and flora north and south of it are recognized. Such biogeographical borders are given special names. Perhaps the most famous is Wallace's Line in Indonesia, named after one of the two original proponents of evolution by natural selection, Alfred Russel Wallace. In Japan, too, we have such lines. The one running through the Tsugaru Strait that separates Hokkaidō from Honshū has, since Blakiston's time, been recognized as a significant zoogeographical boundary and is now known as Blakiston's Line[1]; identified by Blakiston, it was immediately named after him. Blakiston's Line continues to be recognized today.

North of the biogeographical divide of Blakiston's Line occur such notable species as Blakiston's Fish Owl [CR] and Brown Bear. South of Blakiston's Line we find Japanese Serow, Japanese Giant Salamander, Asiatic Black Bear and Japanese Macaque. Some species, such as Red Fox, occur naturally on both sides of the 'line', indicating either their much more ancient distributions or that they have been able to colonize the northern and central parts of Japan successfully and separately more than once from the continent of Asia. A small selection of species occurs both north and south of Blakiston's Line, but not through natural causes. The Japanese Marten, a predatory denizen of the main islands south of the Tsugaru Strait, has been introduced into Hokkaidō and currently thrives there, mainly in the southwest. Conversely, the vegetarian rodent Siberian Chipmunk, considered appealing by tourists to Hokkaidō, has been introduced into various parts of Honshū, Shikoku and Kyūshū.

One of the specimens collected by Blakiston and shipped to Britain was of the enormous owl that now bears his name – Blakiston's Fish Owl. In 2021 it is both rare and endangered. I have had the good fortune of watching it frequently in the wild in Hokkaidō and observing it in the collection of specimens housed in Tring, in the English countryside, including the original specimen taken by Blakiston. Today, the Tring-based collection, which began as the private collection of Lord Lionel Walter, Baron Rothschild (1868–1937), houses almost 750,000 specimens of more than 95 percent of the world's bird

1 Named after the businessman and naturalist Thomas Wright Blakiston (TWB), who lived in Hakodate. The term was first used by John Milne in the questions session after TWB's presentation of the evidence to the Asiatic Society of Japan in Tōkyō.

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species. Among them are 8,000 type specimens (the representative specimens from which species are first described), including Blakiston's eponymous owl. The enormous diversity of priceless material there was certainly overwhelming, but, in the company of fish-owl researcher Mr Yamamoto Sumio, only one specimen captured and held our attention – the very specimen of the owl sent by Blakiston. Having stood together on cold winter nights beside frozen rivers in east Hokkaidō while watching for and listening to this owl, on seeing that rare specimen in Tring we felt as if we had been transported back in time. We could imagine what a thrill it must have been to be an ornithologist in Japan in the late 1800s.

Numerous Japanese naturalists have each left their mark on the natural history of the country, but few have achieved the great significance and international fame accrued by Kämpfer, Thunberg, Siebold and Blakiston, whose pioneering work allowed the West to learn so much about this fascinating country.

Blakiston's Fish Owl occurs only north of Blakiston's Line, which separates Hokkaidō from Honshū [MAB].

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Index

This index includes the animals, plants, places, people, categories and concepts mentioned in the text. It also includes the scientific names (in *italics*) of species referred to, as English names may not be familiar to some readers. The index does not include information included on the maps and illustrations.

Regular black text is used for species and general terms, **bold text** for geographical locations, and SMALL CAPITALS for people.

Page numbers in **bold text** highlight main sections in the book.

Page numbers in *italics* relate to the location of a photograph (in some cases there is also associated text on these pages).

Page numbers in regular text indicate other key references.

A

Accentor, Alpine (*Prunella collaris*) 60, 359
—, Japanese (*Prunella rubida*) 60, 155, 242, 357, 358, 359
Aichi Prefecture 36, 102, 242
Ainu 51, 97, 149, 150, 152, 163, 164, 167, 192, 262
Aira Caldera 26, 134, 273, *274*
Aira Volcano 273
Akan Village 181
Akan–Mashū National Park *23*, 30, 82, 137, 139, 156, *157*, 167, 232, 233
Akiyoshidai Quasi National Park *216*, 217
Akiyoshidō *216*, 217
Akkeshi 206
Albatross, Black-footed (*Phoebastria nigripes*) 74, 340, *341*, 346, 360
—, Grey-headed (*Thalassarche chrysostoma*) 54
—, Laysan (*Phoebastria immutabilis*) 340, *341*, 346
—, Short-tailed (*Phoebastria albatrus*) 6, *27*, 28, 74, 130, *131*, 334, 337, **340–343**, 346, 358, 360
Alder, Japanese (*Alnus japonica*) 83
Alpine *56*, 57, **59–61**, 79, 155, 244, 248, 250
Alps, Japan | Japanese 25, 33, 36, 43, *56*, 100, 133, 134, 173, 212, *238*, 240, *241*, **242–246**, 250, 262, 266, 308, 360
—, Northern 242, 244, 250
Amami Guntō National Park 312
Amami Ōshima 38, *43*, 44, *64*, *73*, 74, 92, 129, 130, 133, 294, 299, *300*, 302, 304, 307, **311–314**, 324, 331, 351, 360
Amanohashidate 214, *215*
Anchovy, Japanese (*Engraulis japonicus*) 183
Anisoptera 92
Ant, Big-headed (*Pheidole megacephala*) 351
Aomori Prefecture 98
Apple, Kirishima Crab (*Malus spontanea*) 134
—, Siberian Crab (*Malus baccata*) 83
Arasaki 134, *136*, 139, **276–279**
Ariake Inland Sea 134, *274*, 276
Asahi-dake 155
Ash, Manchurian (*Fraxinus mandschurica*) 151
—, Späth's (*Fraxinus spaethiana*) 151
Aso Caldera 23, *25*, 26, 273
Aso Global Geopark 273
Aso–Kuju National Park 273
Aspen, Eurasian (*Populus tremula*) 83
Auklet, Rhinoceros (*Cerorhinca monocerata*) *74*, **182–185**
AUSTIN JR, OLIVER 342
Avens, Aleutian (*Sieversia pentapetala*) 155
Azalea, Japanese (*Rhododendron japonicum*) 239
—, Kaempfer's (*Rhododendron kaempferi*) 274, *275*
—, Kyushu (*Rhododendron kiusianum*) 134, 274, *275*
—, Yakushima (*Rhododendron yakushimanum*) 133
Azusa River *244*

B

Badger, Japanese (*Meles anakuma*) *58*, 134, *136*, 198, 212, *259*
BALOGH, GREG 343
Bamboo, Broad-leaf (*Sasa palmata*) 152
—, Dwarf (*Sasa senanensis*) *67*
—, Kuril (*Sasa kurilensis*) 152
Bandai–Asahi National Park *127*, *238*, 239
Bass, Largemouth (or Black) (*Micropterus salmoides*) 124, *125*, 214, 270, 335
Basswood (*Tilia americana*) 80

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Bat, Bonin Fruit (=Bonin Flying Fox *Pteropus pselaphon*) ... 336, *339*, 347, 348
—, Greater Horseshoe (*Rhinolophus ferrumequinum*) ... *348*
—, Japanese Long-eared (*Plecotus sacrimontis*) ... *348*
—, Lesser Leaf-nosed (*Hipposideros turpis*) ... *354*
—, Little Bent-winged (*Miniopterus fuscus*) ... *348*
—, Okinawa Fruit (=Okinawa Flying Fox *Pteropus loochoensis*) ... 355
—, Okinawa Little Horseshoe (*Rhinolophus pumilus*) ... *348*
—, Ryukyu Fruit (=Ryukyu Flying Fox *Pteropus dasymallus*) ... *95*, **347–349**
—, Ryukyu Tube-nosed (*Murina ryukyuana*) ... *311*, 312
Bay, **Gesashi** ... 317
—, Kagoshima ... 34, 273
—, Kinkō ... 134, 273
—, Tōkyō ... 34, 212, 280
Bayadera, Yaeyama (*Bayadera ishigakiana*) ... 318
Bear, Asiatic Black (*Selenarctos thibetanus*) ... 98, *246*, **260–262**
—, Brown (*Ursus arctos*) ... 16, 97, 98, 123, 150, 155, **162–164**, 192, 200, 260, *352*
—, Moon (=Asiatic Black Bear *Selenarctos thibetanus*) ... 98, *246*, **260–262**
Beech, Siebold's (or Japanese) (*Fagus crenata*) ... 30, *31*, 83, 151, 217, 274
Beetle, Pandanus Bark (*Phylloplatypus pandani*) ... 349
—, Yambaru Long-armed Scarab (*Cheirotonus jambar*) ... 317, *319*
Beppu ... 30
Biodiversity ... **89–95**
Biogeography ... **92–121**
Birch, Erman's (*Betula ermanii*) ... 60, 83, 151, 155, *158*
—, Japanese Monarch (*Betula maximowicziana*) ... 274
Birds ... **356–361**
Bison, Steppe (*Bison priscus*) ... 250
Bittern, Cinnamon (*Ixobrychus cinnamomeus*) ... 302, *325*, 360
—, Eurasian (*Botauris stellaris*) ... 66
—, Yellow (*Ixobrychus sinensis*) ... 66, 325
Blackvein, Eastern (*Aporia hippia*) ... 239
Blakiston, Thomas Wright ... 4, **12–17**, 51, 52
Blakiston's Line ... 16, 98, 218, 260, 356
Blite, Sea (*Suaeda maritima*) ... 82
Blue, Large Shijimi (*Shijimiaeoides divinus asonis*) ... 273
Blue, Scarce Large (*Maculinea teleius*) ... 273
Blueberry, Oval-leaved (*Vaccinium ovalifolium*) ... 152
Bluegill (*Lepomis macrochirus*) ... 124, *125*, 214, 270, 335
Bluetail, Red-flanked (*Tarsiger cyanurus*) ... 60, *241*, 242
Boar, Wild (*Sus scrofa*) ... *265*, **324**
Bonin Islands ... **333–351**
Boobook, Northern (*Ninox japonica*) ... 154, 357, 359
Booby, Brown (*Sula leucogaster*) ... 74, 318, *334*, 340, **344–345**
Bōsō Peninsula ... 38, 256, 337
Brambling (*Fringilla montifringilla*) ... *112*, 357
Bulbul, Brown-eared (*Microscelis amaurotis*) ... 71, 140, *141*, *237*, **286–289**, 297, 311, 358, 359
—, Light-vented (*Pycnonotus sinensis*) ... 360
Bullfinch, Grey-bellied (*Pyrrhula griseiventris*) ... 112
Bullfrog, American (*Lithobates catesbeianus* or *Rana catesbeiana*) ... 335
Bunting, Chestnut-eared (*Emberiza fucata*) ... 66, *114*, 115
—, Elegant (*Emberiza elegans*) ... *114*, 357
—, Grey (*Emberiza variabilis*) ... 114, *115*, 358
—, Japanese Reed (*Emberiza yessoensis*) ... 66, 102, 212, *213*, 359
—, Masked (*Emberiza personata*) ... 114, *115*, 357
—, Meadow (*Emberiza cioides*) ... 66, *114*, 357
—, Rustic (*Emberiza rustica*) ... 114, *115*, 357
—, Yellow (*Emberiza sulphurata*) ... 114, *115*, 134, 357, 358
—, Yellow-breasted (*Emberiza aureola*) . 114, *115*
—, Yellow-browed (*Emberiza chrysophrys*) ... 358
Bush Warbler, Japanese (*Horornis diphone*) ... 66, 234, *284*, **290–291**, 359
Butterflies ... **109**
Butterfly, Ogasawara Blue (*Celastrina ogasawaraensis*) ... 350
Buttonquail, Barred (*Turnix suscitator*) ... 360
Buzzard, Eastern (*Buteo japonicus*) ... 60, 154, 159, *173*, 342
—, Grey-faced (*Butastur indicus*) ... 63, 357, 360
—, Oriental Honey (*Pernis orientalis*) ... 74
—, Rough-legged (*Buteo lagopus*) ... 173

C

Cabbage, Asian Skunk (*Lysichiton camtschatcensis*) ... *159*, *166*

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Cabbage, Deer (*Fauria crista-galii*) ... 155
Caldera, Aira ... 26, 134, 273, *274*
—, Aso ... 23, *25*, 26, 273
—, Kussharo ... *21*, 26, 27, *157*
—, Mashū ... 26, 27, *156*, 233
Callianthemum, Japanese (*Callianthemum hondoense*) ... 244
Camellia, Chinese (*Camellia reticulata*) ... 296
—, Japanese (*Camellia japonica*) ... **296–297**
Cape Erimo ... 51, 205, 207
Cape Hedo ... 317
Cape Muroto ... 143
Cape Nosappu ... 47, 52
Cape Ochiishi ... 52
Cape Sata ... 308
Cape Sōya ... 185
Cat (*Felis catus*) ... **270–271**
—, Iriomote (*Prionailurus bengalensis iriomotensis* (previously *Mayailurus iriomotensis*)) ... *94*, 300, *304*, 305, 312, 317
—, Leopard (*Prionailurus bengalensis*) ... 300, 305, *353*
—, Tsushima (*Prionailurus bengalensis euptilurus*) ... *353*
Cattle (*Bos taurus*) ... **270**
Cedar, Japanese (or Yakushima) (*Cryptomeria japonica*) ... 31, 133, *134*, *308*, 310
Central Japan ... 33, 60, 63, 66, 160, 189, 218, 257, 258, 306, 351, 353, 354, 358, 359, 360
Cherry, Mountain (*Prunus jamasakura*) ... 79, *85*
—, Yoshino (*Prunus yedoensis*) ... 79, *85*
Chestnut, Japanese (*Castanea crenata*) ... 79
—, Japanese Horse (*Aesculus turbinata*) ... 217
Chiba Prefecture ... 29, 256, 280, 351
Chichi-jima ... 28, 95, 140, 334, 336, 347, 348, 350, 351
Chichibu–Tama–Kai National Park ... 239, 260
Chicken (*Gallus gallus domesticus*) ... 270
Chinquapin, Japanese (*Castanopsis cuspidata*) ... 300
Chipmunk, Siberian (*Eutamias sibiricus*) ... 16, *97*, 189, **190–194**
Chōshi City ... 280
Chūbu Region ... 212
Chūgoku Mountains ... 214
Chūgoku Region ... 43, 217
Cicada, Ogasawara (*Meimuna boninensis*) ... 349
City, Chōshi ... 280
—, Hakodate ... 15, 16, 186
—, Hiroshima ... 80, 214, 217, *276*
—, Izumi ... 134, *136*, *276*, 277, 278, *279*
City, Kushiro ... 47, 166, 178, 181
—, Kyōto ... 80, 212, 221, 310
—, Nagoya ... 71, 80
—, Nara ... 212, 326
—, Ōsaka ... 71, 212, 218, 237
—, Shimonoseki ... 217
—, Tomakomai ... 286
—, Toyooka ... 214
—, Wakkanai ... 47, 185
Climate ... **41–55**
Clione (=Sea Angel *Clione limacina*) ... *47*
Clubtail, Yaeyama (*Leptogomphus yayeyamensis*) ... 301
Commensal(ism) ... 70, 71, *104*, **122**, 271
Competition ... **284–285**
Coral | Coral reef ... 10, *32*, 40, 57, 59, 74, 214, 217, 218, *298*, 300, 303, 308, 312, 315, 317, 318, 330, 345
Cormorant, Great (*Phalacrocorax carbo*) ... 68, **221**
—, Japanese (=Temminck's Cormorant *Phalacrocorax capillatus*) ... 73, 165, **221**, 358
—, Pelagic (*Phalacrocorax pelagicus*) ... *221*
—, Red-faced (*Phalacrocorax urile*) ... 73, **221**, 359
—, Temminck's (*Phalacrocorax capillatus*) ... 73, 165, **221**, 358
Corncrake (*Crex crex*) ... 336
Cottongrass, Hare's-tail (*Eriophorum vaginatum*) ... 239
Cowberry (*Vaccinium vitis-idaea*) ... 155
Crab, Asian Soldier (*Mictyris brevidactylus*) ... *331*
—, Dussumier's Fiddler (*Tubuca dussumieri*) ... *331*
—, Japanese Horseshoe (*Tachypleus tridentatus*) ... 214, *215*
—, Milky Fiddler (*Uca lactea*) ... *331*
—, Orange Fiddler (*Uca vocans*) ... *331*
—, Orange Mud (*Scylla olivacea*) ... *331*
—, Tetragonal Fiddler (*Gelasimus tetragonon*) ... *331*
Crake, Ruddy-breasted (*Porzana fusca*) ... 66
—, Slaty-legged (*Rallina eurizonoides*) ... 360
Cranberry, Mountain (*Vaccinium vitis-idaea*) ... 155
Crane, Common (*Grus grus*) ... 277
—, Demoiselle (*Grus virgo*) ... 277
—, Hooded (*Grus monacha*) ... 71, 134, *136*, 139, *141*, **276–279**, 357
—, Red-crowned (*Grus japonensis*) ... 6, 66, *126*, 129, 130, 136, 139, 152, *172*, **178–180**, 197, 276, 335, 359

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Crane, Sandhill (*Antigone canadensis*) ... *277*
—, Siberian (*Leucogeranus leucogeranus*) ... 277, *279*
—, White-naped (*Antigone vipio*) ... 71, 100, 134, 139, **276–279**, 357
Crawfish, Louisiana (*Procambarus clarkii*) ... 351
Crayfish, Japanese (*Cambaroides japonicus*) ... 351
—, Signal (*Pacifastacus leniusculus*) ... 351
Cricket, Band-legged Ground (*Dianemobius nigrofasciatus*) ... *30*
Crossbill, Red (*Loxia curvirostra*) ... 112, *113*, 188
Crow, Carrion (*Corvus corone*) ... 70, 233
—, Japanese (or Large-billed) (*Corvus* (*macrorhynchos*) *japonensis*) ... 70, 71, 102, *103*, **230–233**, 357, 359
—, Oriental (*Corvus orientalis*) ... 70, 102, *103*, **230–233**
Cuckoldry ... 234
Cuckoo, Common (*Cuculus canorus*) ... 66, 167, **234–235**, 290
—, Lesser (*Cuculus poliocephalus*) ... 234, *235*
—, Oriental (*Cuculus optatus*) ... 234, *235*, 290
Cultivation ... **70–71**
Current, Kuroshio ... 38, 73, 134, 299
—, Oyashio ... 38, 73, 202, 353
—, Sōya ... 38
—, Tsugaru ... 38
—, Tsushima ... 38, 214
Currents ... **38–40**
Cycad, Sago (=Japanese Sago Palm *Cycas revoluta*) ... 57, 315
Cypress, Hinoki (or Japanese) (*Chamaecyparis obtusa*) ... 31, 261
—, Patagonian (*Fitzroya cupressoides*) ... 310

D

Daikoku Island ... 207
Daisetsu Mountains ... *58*, *60*, 97, 137, 149, **155**, 162, 191, 247, *251*
Damselfly, Amami (*Rhipidolestes amamiensis*) ... *301*, 312
—, Ryukyu (*Coeliccia ryukyuensis*) ... *93*, 301, 321
—, Shikoku (*Rhipidolestes hiraoi*) ... 274
—, Yaeyama Gossamer-wing (*Euphaea yayeyamana*) ... 301
—, Yakushima (*Rhipidolestes yakusimensis*) ... 274
—, Yambaru (*Rhipidolestes shozoi*) ... 321
Daylily, Amur (*Hemerocallis middendorffii*) ... 83
—, Hokkaidō (*Hemerocallis yezoensis*) ... 83
Deer, Ancient Japanese (*Cervus praenipponic*) ... 250
Deer, European Red (*Cervus elaphus*) ... 321
—, Japanese (or Sika) (*Cervus nippon*) ... 6, *96*, *284*, *304*, 310, **321–323**, 326
—, Spotted (*Axis axis*) ... 310
—, Yabe's Giant (*Sinomegaceros yabei*) ... 250, *251*
Dejima ... **12–15**, 327
Dipper, Brown (*Cinclus pallasii*) ... 68, 217, 274, **282–284**
Dog (*Canis lupus familiaris*) ... **270–271**
—, Raccoon (=Tanuki *Nyctereutes procyonoides*) ... 98, 228, 242, **258–259**, 265, 304, *353*
Dogwood, Kousa (*Cornus kousa*) ... 244, *245*
Dollarbird (*Eurystomus orientalis*) ... 63, 359
Dolphin, Common Bottle-nosed (*Tursiops truncatus*) ... 144, 146
—, Indo-Pacific Bottlenose (*Tursiops aduncus*) ... *145*, 146
—, Pacific White-sided (*Lagenorhynchus obliquidens*) ... 98, 140, *143*, 144, 146
—, Risso's (*Grampus griseus*) ... 98, 144
—, Spinner (*Stenella longirostris*) ... *145*, 146
Dormouse, Japanese (*Glirulus japonicus*) ... 10, *98*, 100, 104, *105*, 354
Dove, Oriental Turtle (*Streptopelia orientalis*) ... 102, *103*, 359
—, Rock (=Feral Pigeon *Columba livia*) ... 71
Dragon, Komodo (*Varanus komodoensis*) ... 267
Dragonflies ... **92–93**
Dragonfly, Japanese Relict (*Epiophlebia superstes*) ... 92, *93*
—, Okinawa Sarasayama (*Sarasaeschna kunigamiensis*) ... 321
—, Pryer's Petaltail (=Pryer's Petaltail *Tanypteryx pryeri*) ... 92, *93*
Duck, Eastern Spot-billed (*Anas zonorhyncha*) ... *103*, 357
—, Falcated (*Mareca falcata*) ... 224, *225*, 359
—, Harlequin (*Histrionicus histrionicus*) ... **118**, 204, 281
—, Long-tailed (*Clangula hyemalis*) ... *119*
—, Mandarin (*Aix galericulata*) ... *68*, **226–229**, 281
—, Tufted (*Aythya fuligula*) ... 214, 358
Dugong (*Dugong dugon*) ... 352
Dunes | Dune Forest ... 10, 59, 79, 82, 83, *84*, 127, 191, 214, *215*

E

Eagle, Golden (*Aquila chrysaetos*) ... 173, *246*
—, Steller's (Sea) (*Haliaeetus pelagicus*) ... 47, 136, 159, 165, **170–172**, 174, *356*

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Eagle, White-tailed (Sea) (*Haliaeetus albicilla*) 47, 159, 165, **170–172**, *175*, 359
Earthquakes **28–29**
Edo 14, 29, 33, 34, 43, 71, *72*, 86, 134, 160, 162, 333
Edo Period 296
Egret, Eastern Cattle (*Bubulcus coromandus*) 357, 359
—, Intermediate (*Egretta intermedia*) 357, 360
—, Little (*Egretta garzetta*) 359
—, Pacific Reef (*Egretta sacra*) 73, 360
Elephant, Naumann's (*Palaeoloxodon naumanni*) *89*, 250, *251*
Elm, Father David (*Ulmus davidiana*) 151
Emperor Tenmu 296
Endemism **90–91**
Ermine (=Stoat *Mustela erminea*) 197
Extinction **123–125**
Ezo Fuji 186, *187*

F

Falcon, Peregrine (*Falco peregrinus*) 159
Fennel, Hog's (*Peucedanum multivittatum*) 155
Fern, Siebold's Wood (*Dryopteris sieboldii*) 15
Fieldfare (*Turdus pilaris*) 358
Fig, Curtain (*Ficus macrocarpa*) 310
—, Sea (*Ficus superba* var. *japonica*) 310
Finch, Asian Rosy (*Leucosticte arctoa*) 112
Fir, Maries' (*Abies mariesii*) 31, 244, *245*
—, Momi (*Abies firma*) 31, 274
—, Nikko (*Abies homolepis*) 31
—, Sakhalin (*Abies sachalinensis*) 83, 151
—, Veitch's Silver (*Abies veitchii*) 31
Fish, Barbel Flying (*Exocoetus monocirrhus*) 98
Flatworm, New Guinea (*Platydemus manokwari*) 351
Flora **77–87**
Flutterer, Variegated (*Rhyothemis variegata*) . *301*
Flycatcher, Blue-and-white (*Cyanoptila cyanomelana*) 234, *240*, 285, 357, 359
—, Grey-streaked (*Muscicapa griseisticta*) 357
—, Japanese Paradise (*Terpsiphone atrocaudata*) 63, *285*, 358, 360
—, Narcissus (*Ficedula narcissina*) *241*, 242, 285, 358
Flying Fox, Bonin (*Pteropus pselaphon*) 336, *339*, 347, 348
—, Okinawa (*Pteropus loochoensis*) 355
—, Ryukyu (*Pteropus dasymallus*) *95*, **347–349**
Flying Squirrel, Japanese (*Pteromys momonga*) *90*, *189*, 195, 218, *219*, 220
—, Japanese Giant (*Petaurista leucogenys*) *88*, 100, 134, *136*, 189, 212, 218, *219*, 220
—, Siberian (*Pteromys volans*) 100, 156, 189, 190, **194–196**, 218, 353
Fox, African Bat-eared (*Otocyon megalotis*) 258
—, Red (*Vulpes vulpes*) 16, 97, **160–161**, 263, 353
Fritillary, Dark Green (*Speyeria aglaja*) 109
—, East Asian (*Argyynis ruslana*) *109*
—, Silver-washed (*Argynnis paphia*) 109
Frog, Amami Brown (*Rana kobai*) *303*
—, Amami Green Tree (*Rhacophorus viridis amamiensis*) *303*
—, Amami Ishikawa's (*Odorrana splendida*) *91*, *303*, 312
—, Amami Tip-nosed (*Odorrana amamiensis*) 303, 312
—, Eiffinger's Tree (*Chirixalus eiffingeri*) 318
—, Greater Tip-nosed (*Rana supranarina*) 317
—, Hallowell's Tree (*Hyla hallowellii*) 303
—, Hokkaidō Brown (*Rana pirica*) *166*
—, Holst's (*Rana holsti*) *317*, 321
—, Namie's (*Rana namiyei*) *320*, 321
—, Okinawa Ishikawa's (*Odorrana ishikawae*) 317, *319*, 321
—, Okinawa Tip-nosed (*Odorrana narina*) *317*
—, Otton (*Rana subaspera*) *303*
—, Owston's Green Tree (*Rhacophorus owstoni*) 318
—, Ryukyu Brown (*Rana okinavana*) 303, *317*
—, Ryukyu Kajika (*Buergeria japonica*) . *302*, 303
—, Utsunomiya's Tip-nosed (*Odorrana utsunomiyaorum*) 317
—, Yaeyama Harpist (*Rana psaltes*) 317
Fuji Five Lakes 212
Fuji–Hakone–Izu National Park 240, 338
Fukushima 29, 239
Fungus, Green PePe (*Mycena chlorophos*) *334*
Fur Seal, Northern (*Callorhinus ursinus*) 40, *50*, 98, **202–205**

G

Gadow, Hans 269
Gadwall (*Mareca strepera*) 359
Gap, **Kerama** 311, 355
Garganey (*Spatula querquedula*) 357
Gecko, Kuroiwa's Ground (*Goniurosaurus kuroiwae*) *320*, 321, 327

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Gecko, Micronesian Saw-tailed (*Perochirus ateles*) ... 336
Geography ... **33–37**
Geology ... **18–31**
Geopark, San'in Kaigan ... 129, 214
—, Unzen Volcano Area ... 26, 129
Geoparks ... **129**
Gesashi Bay ... 317
Gifu Prefecture ... 36, 191, 221, 222, 242
Ginkgo (*Ginkgo biloba*) ... 13, *85*, **86–87**
Glacial Maximum ... 10, 89, 248, 249, 250
Glacier ... 244, 250, *251*
Glasswort, Common (*Salicornia europaea*) ... *82*
Global Geopark, Aso ... 273
Goat, Feral (*Capra aegagrus hircus*) ... 351
Goldeneye, Common (*Bucephala clangula*) ... *119*
Goosander (=Common Merganser *Mergus merganser*) ... 118, *119*, 359
Goose, Brent (*Branta bernicla orientalis*) ... 73
—, Cackling (*Branta hutchinsii*) ... 224, *225*
—, Greater White-fronted (*Anser albifrons*) ... 136, *137*, 210, 224, *224*, 359
—, Lesser White-fronted (*Anser erythropus*) . 224
—, Snow (*Anser caerulescens*) ... 224, *225*
—, Taiga Bean (*Anser fabalis middendorffii*) .. 359
—, Tundra Bean (*Anser serrirostris*) ... 224
Gorge, Three-Level ... *217*
Goshawk, Northern (*Accipiter gentilis*) ... 159, 226, 228
GOWLAND, WILLIAM ... 245
Grass, Bamboo (*Sasa veitchii*) ... 66, 151
—, Murain (*Ischaemum anthephoroides*) ... 83
Grassbird, Marsh (*Locustella pryeri*) ... 66, 102, *213*, 359
Grasshopper Warbler, Lanceolated (*Locustella lanceolata*) ... 66, 102
—, Middendorff's (*Locustella ochotensis*) ... 66, *101*, 102
—, Sakhalin (*Locustella amnicola*) ... 66, *101*, 102, 359
—, Styan's (*Locustella pleskei*) ... *339*, 340
Grasslands ... **66–67**
Grebe, Black-necked (*Podiceps nigricollis*) ... 118
—, Red-necked (*Podiceps grisegena*) ... 118, 359
—, Slavonian (*Podiceps auritus*) ... 118
Greenfinch, Ogasawara (*Chloris kittlitzi*) ... 334, 336
—, Oriental (*Carduelis sinica*) ... 102, *103*, 112, 195, 340, 357, 359, 361
Greenling, Japan Sea (*Pleurogrammus azonus*) ... 183
Grosbeak, Japanese (*Eophona personata*) ... *112*
—, Pine (*Pinicola enucleator*) ... 60, 112, *113*, 359
Grouse, Hazel (*Tetrastes bonasia*) ... 60, *148*, 173, *249*, 359
Guillemot, Common (*Uria aalge*) ... *185*, 359
—, Spectacled (*Cepphus carbo*) ... 165, *185*, 359
Gull, Black-tailed (*Larus crassirostris*) ... 116, *120*, *121*, 358
—, Common (*Larus canus*) ... 121
—, Common Black-headed (*Chroicocephalus ridibundus*) ... 357
—, Franklin's (*Leucophaeus pipixcan*) ... 357
—, Glaucous (*Larus hyperboreus*) ... *121*
—, Glaucous-winged (*Larus glaucescens*) ... *121*
—, Saunders's (*Chroicocephalus saundersi*) ... 68, 134
—, Slaty-backed (*Larus schistisagus*) ... *121*, 359
—, Vega (*Larus vegae*) ... 121

H

Habitats ... **57–75**
Habu, Okinawa (*Protobothrops flavoviridis*) ... *313*, 314, 327
—, Princess (*Protobothrops okinavensis*) *313*, 314
—, Sakishima (*Trimeresurus elegans*) ... 317
—, Tokara (*Protobothrops tokarensis*) ... 314
Hachigorō Toshima Wetlands ... 214
Hachijō Island | Hachijō-jima 28, 333, 337, 338
Hachisuka's Line ... 355
Hagi ... 217
Haha-jima ... 28, 95, 334, 335, 336, 348, 350, 351
Hairstreak, Ezo (*Favonius jezoensis*) ... 109
—, Green (*Callophrys rubi*) ... 109
—, Many-striped (*Japonica saepestriata*) ... *109*
—, Oriental (*Favonius orientalis*) ... 109
—, Zephyrus (*Neozephyrus japonicus*) ... 109
Hakodate | Hakodate City ... 15, 16, 186
Hare, Japanese (*Lepus brachyurus*) . **257**, 264, 352
—, Mountain (*Lepus timidus*) ... 173, 198, **257**, 264, 354
Harrier, Eastern Marsh (*Circus spilonotus*) ... 66
HASEGAWA HIROSHI ... 342, *343*, 346, 347
HATTORI TŌRU ... 340
Hawfinch (*Coccothraustes coccothraustes*) ... *112*
Hawk-Cuckoo, Northern (*Hierococcyx sparverioides*) ... 234, *235*
Hawk-Eagle, Japanese (or Mountain) (*Nisaetus orientalis*) ... 173, 228
Hazel, Evergreen Witch (*Distylium racemosum*) ... 274

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Hazel, Fragrant Witch (*Corylopsis glabrescens*) ... 134
Heather, Clubmoss Mountain (*Cassiope lycopodioides*) ... 155, *186*
Hemlock, Northern Japanese (*Tsuga diversifolia*) ... 31, *245*
—, Southern Japanese (*Tsuga sieboldii*) ... *15*, 31, 274
Heron, Black-crowned Night (*Nycticorax nycticorax*) ... 325
—, Chinese Pond (*Ardeola bacchus*) ... *325*
—, Grey (*Ardea cinerea*) ... 325
—, Japanese Night (*Gorsachius goisagi*) ... 63, *358*
—, Malayan Night (*Gorsachius melanolophus*) ... *325*, 360
—, Purple (*Ardea purpurea*) ... 302, *325*, 360
—, Striated (*Butorides striata*) ... 359
Herring, Pacific (*Clupea pallasii*) ... 143
Hiba (=Thujopsis *Thujopsis dolobrata*) ... 31, 83
Hichiso Precambrian Museum ... 20
Hida Mountains ... 242, 244, 250
Hidaka Mountains ... 21, 247, 248
Hiroshima City ... 80, 214, 217, *276*
Hobby, Northern (*Falco subbuteo*) ... 359
Hokkaidō ... **149–208**
Honeyeater, Bonin (Island) (*Apalapteron familiare*) ... 65, *75*, 95, 334, 336, *339*, 358, 360
Honshū ... **209–272**
Horse (*Equus caballus*) ... **270–271**
Hot Springs (Onsen | Rotenburo) ... **30**, 165, 177
Huchen, Japanese (*Hucho perryi*) ... *166*, 167
Hwamei, Chinese (*Garrulax hwamei*) ... *291*
Hydrangea, Climbing (*Hydrangea petiolaris*) ... *151*, 152
—, Taki's (*Hydrangea otaksa*) ... *14*
Hymenoptera ... 92

I

Ibis, Crested (*Nipponia nippon*) ... 6, 71, 100, *130*, 212, *213*, 335, 359
Inland Sea ... 38, 43, 214, *272*, 322
Invasive alien species ... 218, 270, *349*, 351
Iriomote Island | Iriomote-jima ... 304, 318, 324, 331
Iriomote–Ishigaki National Park ... 317
Iris, Beachhead (*Iris setosa*) ... 83
Ishikari Plain ... 36
Ishikari River ... 280
Island, Daikoku ... 207
—, **Hachijō** ... 28, 333, 337, 338
—, **Iriomote** ... 304, 318, 324, 331
—, **Minami Iwō** ... 28, 336, 348
—, **Miyake** ... 26, 27, 28, 333, 335, 337, **338–339**, 340
—, **Miyako** ... 300, 315
—, **Rebun** ... 134, 181
—, **Rishiri** ... 74, 134
—, **Sado** ... 38, *70*, 71, 100, 104, 130, 212, 258
—, **Teuri** ... 74, 181, **182–185**, 357
—, **Yonaguni** ... 33, 315, 360
Islands, Bonin ... **333–351**
—, **Iwō** ... **333–351**
—, **Izu** ... **333–351**
—, **Kerama** ... 140, 143, 146, *147*, *315*, 321, *323*
—, **Ogasawara** ... **333–351**
—, **Oki** ... 129, 214
—, **Ryūkyū** ... 301, 302, 303
—, **Senkaku** ... 343, 360
—, **Yaeyama** ... *34*, 38, 92, 109, 200, 243, 301, 315, 317, *319*, 320, 325, 347, 354, 360
Itaji Chinkapin (*Castanopsis sieboldii*) ... 10, *64*, *248*, 274, 299, 310, 317
Itsukushima Shrine ... *216*, 217, 326
Iwō Islands ... **333–351**
Iwō-zan ... *23*, 30, *158*, 165
Izu Islands ... **333–351**
Izu Ōshima ... 218, 256, 337
Izumi City ... 134, *136*, *276*, 277, 278, *279*
Izu-numa ... 136, *137*, 139, 210, 224

J

Jackdaw, Daurian (*Coloeus dauuricus*) ... *286*, 357
Jacob's Ladder, Kyūshū (*Polemonium kiushianum*) ... 273
Japan Alps | Japanese Alps ... 25, 33, 36, 43, *56*, 100, 133, 134, 173, 212, *238*, 240, *241*, **242–246**, 250, 262, 266, 308, 360
Japanolirion, Oze (*Japanolirion osense*) ... 239
Jay, Eurasian (*Garrulus glandarius*) ... 230, *233*
—, Lidth's (*Garrulus lidthi*) ... 65, 311, *320*, 321, 358, 360
Jigokudani ... 212, *251*, 253, *255*, 256
Jōmon ... 133, 149, 263, 271, 296, 309, *309*
Jōshinetsu Kōgen National Park ... 239
Juniper, Shore (*Juniperus conferta*) ... 83

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K

Kabaya Tsuruhiko ... 318
Kagoshima Bay ... 34, 273
Kagoshima Prefecture ... 34, *70*, 277
Kamel, Georg Joseph ... 296
Kamikōchi ... *244*, *245*
Kämpfer, Engelbert ... 4, **12–17**, 86, 296
Kamuy Mintara ... 97, 150
Kandelia, Narrow-leaved (*Kandelia candel*) ... 82, 330
Kansai Region ... 36, 212, 214
Kantō Plain ... 33, 34, 36, 43, 280
Kantō Region ... 29, 33, 34, 36, 43, 212, 280
Karst landscape ... *216*, 217
Karuizawa ... 134, 139, 212
Kasai Marine Park ... 212
Kasai Rinkai Kōen ... 212
Katsura (*Cercidiphyllum japonicum*) ... *62*, 151
Kawaguchi Magojiro ... 290
Keelback, Tiger (*Rhabdophis tigrinus*) ... *326*
Kerama Gap ... 311, 355
Kerama Islands ... 140, 143, 146, *147*, *315*, 321, *323*
Kestrel, Common (*Falco tinnunculus*) ... 359
Kii Mountains ... 214
Kii Peninsula ... 256
Kingfisher, Collared (*Todiramphus chloris*) ... 358
—, Common (*Alcedo atthis*) ... 68, 217, **281**, 282, *283*
—, Crested (*Megaceryle lugubris*) ... 68, 274, **281**, *283*
—, Ruddy (*Halcyon coromanda*) ... 63, *275*
Kinki Region ... 43
Kinkō Bay ... 134, 273
Kirishima Mountains ... 27, 34, 127, 133, 134, *135*, 273, *274*
Kirishima–Kinkōwan National Park ... 133, *135*, 273
Kite, Black-eared (*Milvus lineatus*) ... 70, **105–106**, 159, *173*
Kiwi, Hardy (*Actinidia arguta*) ... 152
—, Variegated-leaf Hardy (*Actinidia kolomikta*) ... *151*, 152
Knot, Great (*Calidris tenuirostris*) ... *275*, 276
Kōbe ... 15, 212
Kōchi Prefecture ... 52, 140
Kodonospora tetracolumnaris (a fungus) ... 349
Komakusa (*Dicentra peregrina*) ... *244*
Koshiabura (*Acanthopanax sciadophylloides*) ... 151
Kuroshio Current ... 38, 73, 134, 299
Kushiro City ... 47, 166, 178, 181
Kushiro River ... 167
Kushiro Shitsugen National Park 139, 166, 178
Kussharo Caldera ... *21*, 26, 27, *157*
Kussharo Kotan ... 158
Kussharo-ko | Kussharo, Lake ... 26, 30, 36, *48*, *157*, 158, 167
Kyōto City ... 80, 212, 221, 310
Kyōto Prefecture ... 214
Kyūshū ... **273–298**

L

La Pérouse Strait ... 38, 150, **46–49**
Lagoon, Sekisei ... 318
Lake Biwa ... *36*, 59, 68, 214, *215*
Lake Inba ... 351
Lake Kasumigaura ... 36
Lake Kussharo ... 26, 30, 36, *48*, *157*, 158, 167
Lake Mashū ... *156*, 158, 159
Lake Nakaumi ... 214
Lake On-ne-tō ... 156
Lake Rausu ... 165
Lake Shikotsu ... 36, *61*, *186*
Lake Shinji ... 214
Lake Tōya ... 36, 186
Lakes, Fuji Five ... 212
Landscape, Karst ... *216*, 217
Langur, Northern Plains (*Semnopithecus entellus*) ... 310
Lapwing, Grey-headed (*Vanellus cinereus*) ... 359
Larch, Japanese (*Larix kaempferi*) ... *13*, 15, 31
Law, The Wildlife Protection and Hunting ... 204
Lawngrass, Japanese (*Zoysia japonica*) ... 82
Leiothrix, Red-billed (*Leiothrix lutea*) ... 66, 351
Lily of the Valley, Asian (*Convallaria keiskei*) .. 83
Lily, Thunberg's (*Lilium maculatum*) ... 83
Lime, Japanese (*Tilia japonica*) ... 83
Linden, American (*Tilia americana*) ... 80
Line, Blakiston's ... 16, 98, 218, 260, 356
—, Hachisuka's ... 355
—, Watase's ... 354, 355
Lingonberry (*Vaccinium vitis-idaea*) ... 155
Linnaeus, Carl ... 12, 13
Lizard, Green Anole (*Anolis carolinensis*) ... 336, **349–351**
—, Okinawan Tree (*Japalura polygonata polygonata*) ... 321, *327*
Lotus (*Nelumbo nucifera*) ... 136

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Luehdorfia, Japanese (*Luehdorfia japonica*) 212
Lupin, False (*Thermopsis lupinoides*) 83

M
Macaque, Japanese (*Macaca fuscata*) 6, 16, 92, 98, *99*, 123, 133, 139, 212, *236*, 237, 239, 246, 250, *251*, **252–256**, 258, 286, 300, 302, 310, 323, 326, 353, 355
—, Rhesus (*Macaca mulatta*) 256, 310
—, Taiwan (*Macaca cyclopis*) 256, 258
Magnolia, Japanese Whitebark (*Magnolia obovata*) 79
—, Kobushi (*Magnolia kobus*) 79
—, Siebold's (*Magnolia sieboldii*) 15
Magpie, Azure-winged (*Cyanopica cyanus*) 234, 359
—, Oriental (*Pica serica*) 286
Mallard (*Anas platyrhynchos*) *103*, 224, 227
Mammals **352–355**
Mamushi, Japanese (*Gloydius blomhoffii*) *327*
Mangrove Apple (*Sonneratia alba*) 82, 330
—, Black (*Bruguiera gymnorrhiza*) 82, *329*,
—, Grey (*Avicennia marina*) 82, 330
—, Looking-glass (*Heritiera littoralis* and *Lumnitzera racemosa*) 317, 330
—, Oval-leaf (*Kandelia obovata*) 310
—, Spider (*Rhizophora stylosa*) 82, 330
Mangroves **328–331**
Maple, Painted (*Acer mono*) 83
Marimo (*Aegagropila linnaei*) *156*
Marten, Japanese (*Martes melampus*) 16, *197*, *198*, 199, *242*
Martin, Asian House (*Delichon dasypus*) *289*
—, Sand (*Riparia riparia*) 359
Maruyama River 214
Mashū Caldera 26, 27, *156*, 233
Mashū-ko *156*, 158, 159
Mashū, Lake *156*, 158, 159
Matatabi (=Silver Vine *Actinidia polygama*) 152
Matrona, Japanese (*Matrona japonica*) *93*, *301*
Me-Akan 156
Megachiroptera 347, 348
Meiji Restoration .. 15, 52, 127, 129, 149, 262, 271
Meiji Shrine *212*
Merganser, Common (*Mergus merganser*) 118, *119*, 359
—, Red-breasted (*Mergus serrator*) 118, *119*
Microchiroptera 347, 348
Migration **360–361**
Milkwort, Sea (*Lysimachia maritima*) 82
Minami Iwō Island | Minami Iwō-jima 28, 336, 348
Ministry of the Environment 6, 178, 205, 343, 351
Minivet, Ryukyu (*Pericrocotus tegimae*) . 358, 360
Mink, American (*Neovison vison*) 52, *123*, 124, 197
Mistletoe, Japanese (*Viscum album* var. *coloratum*) 106
Miyagi Prefecture 104, 136, 139, 224
Miyake Island | Miyake-jima 26, 27, 28, 333, 335, 337, **338–339**, 340
Miyako Island | Miyako-jima 300, 315
Mongoose, Small Asian (or Small Indian or Javan) (*Herpestes javanicus*) 95, 124, *314*, 321, 336, 351
Monkey, Snow (=Japanese Macaque *Macaca fuscata*) 6, 16, 92, 98, *99*, 123, 133, 139, 212, *236*, 237, 239, 246, 250, *251*, **252–256**, 258, 286, 300, 302, 310, 323, 326, 353, 355
Mountains, Chūgoku 214
—, Daisetsu *58*, *60*, 97, 137, 149, **155**, 162, 191, 247, *251*
—, Hida 242, 244, 250
—, Hidaka 21, 247, 248
—, Kii 214
—, Kirishima 27, 34, 127, 133, 134, *135*, 273, *274*
—, Shirakami 129, *209*, 210
Mouse, Eurasian Harvest (*Micromys minutus*) 104, *105*
—, House (*Mus musculus*) 271
—, Large Japanese Field (*Apodemus speciosus*) 104, *105*, 304
—, Small Japanese Field (*Apodemus argenteus*) 104
Mt Asahi 155
Mt Aso 22, *25*, 26, 27, 273
Mt Bandai 239
Mt Chibusa 335
Mt Daisen 214
Mt Fuji .. *1*, *18*, 26, 33, 57, 134, 178, 212, 240, 338
Mt Iwate 210
Mt Iwō *23*, 30, *158*, 165
Mt Kirishima 273
Mt Miyanoura 133, 308
Mt Oyama 338
Mt Rausu 165

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Mt Sakurajima 26, 27, 34, 134, 273, *274*
Mt Shinmoe *22*, 134
Mt Usu 26, 27, 129, 186
Mt Yonaha 317
Mt Yōtei 186, *187*
Mt Yuwan 299
Mudskipper, Barred (*Periophthalmus argentilineatus*) *329*
Muko-jima 28, 336, 346
Muroran 140
Murre, Common (=Common Guillemot *Uria aalge*) *185*, 359
Murrelet, Japanese (*Synthliboramphus wumizusume*) 74, 358
Museum, Hichiso Precambrian 20
Myōkō–Togakushi Renzan National Park 239
Myotis, Large-footed (*Myotis macrodactylus*) *347*
—, Yanbaru (*Myotis yanbarensis*) *311*, 312

N

Nagano Prefecture 30, 36, *67*, 98, 139, 212, 237, 239, 242, 244, 250, *251*, 253, 260, 280
Nagasaki **12–15**, 335
Nagoya City 71, 80
Nansei Shotō 6, 10, 33, 38, 43, 57, 60, 65, 73, 77, 82, 83, 92, 95, 138, 139, 140, 144, 243, 274, 285, 294, **299–332**, 347, 352, 356, 357, 358, 359, 360, 361
Nara City 212, 326
National Park, Akan–Mashū *23*, 30, 82, 137, 139, 156, *157*, 167, 232, 233
—, **Akiyoshidai Quasi** *216*, 217
—, **Amami Guntō** 312
—, **Aso–Kuju** 273
—, **Bandai–Asahi** *127*, *238*, 239
—, **Chichibu–Tama–Kai** 239, 260
—, **Fuji–Hakone–Izu** 240, 338
—, **Iriomote–Ishigaki** 317
—, **Jōshinetsu Kōgen** 239
—, **Kirishima Kinkōwan** 133, *135*, 273
—, **Kushiro Shitsugen** 139, 166, 178
—, **Myōkō–Togakushi Renzan** 239
—, **Nikko** *66*, 239, *240*
—, **Nishi-Chūgoku Sanchi Quasi** 217
—, **Ō-numa Quasi** 186
—, **Oze** *239*
—, **Rishiri–Rebun–Sarobetsu** 181
—, **Saikai** 273
—, **San'in Kaigan** 214
National Park, Shiretoko 97, **165–167**
—, **Unzen–Amakusa** 273
—, **Yambaru** 317
Natural Monument 52, 80, 105, 266, 269, 278, 312, 342, 346
Needlewood (*Schima wallichii*) *299*
Nematode, Pine Wood (*Bursaphelenchus xylophilus*) 335
Nemuro 47, 207
Nemuro Peninsula 52, 198
Nemuro Strait 52, 136, 140, 143, 146, 165, 170, 204
Newt, Anderson's Crocodile (*Echinotriton* (or *Tylototriton*) *andersoni*) 303, *304*
—, Sword-tailed (*Cynops ensicauda*) *302*, 303
Nightingale, Common (*Luscinia megarhynchos*) 290
Niigata Prefecture 36, 70, 104, 191, 239, 280
Nikkō National Park *66*, 239, *240*
Nishi-Chūgoku Sanchi Quasi National Park 217
Nōbi Plain 36
Noddy, Brown (*Anous stolidus*) 74, 318, 360
Northern Alps 242, 244, 250
Noto Peninsula 212, 361
Nutcracker, Spotted (or Eurasian) (*Nucifraga caryocatactes*) *56*, 60, 230, *233*, 292, 360
Nuthatch, Eurasian (*Sitta europaea*) 194, 295

O

O-Akan 156
Ō-numa Quasi National Park 186
Oak, Daimyo (*Quercus dentata*) 83
—, Japanese Blue (*Quercus glauca*) 274
—, Japanese Willow-leaf (*Quercus salicina*) 274
—, Jolcham (*Quercus serrata*) 310
—, Mongolian (*Quercus mongolica*) 83, 151, 165, 260, 274
—, Okinawan (*Quercus miyagii*) *65*, 300
Oakleaf, Orange (*Kallima inachus*) *65*, 109
Odonata 10, 92
Ogasawara Islands **333–351**
Oki Islands 129, 214
Okinawa 10, 33, 43, 44, 46, *64*, 74, *76*, 92, 95, 102, 106, 129, 130, 140, 166, 200, 234, 257, 294, 300, 302, 305, 307, 311, 312, 315, *316*, 317, 318, 320, 321, 326, 336, 347, 348, 351, 352, 355, 360
Okinawa Trough 23, 299

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Orca (*Orcinus orca*) ... 98, 136, *142*, 143, 144, *145*, 146, *352*
Oriental Region 10, 301, 354, 355, 356, 359, 360
Ōsaka City ... 71, 212, 218, 237
Ōsaka Plain ... 36
Osprey, Western (*Pandion haliaetus*) ... *68*
Ōsumi Peninsula ... 273
Otter, Eurasian (*Lutra lutra*) ... 51, 52, 123, 198, 280
—, Japanese (*Lutra nippon*) ... 355
—, Sea (*Enhydra lutris*) ... 40, **50–52**, 57, 198
Owl, Blakiston's Fish (*Bubo blakistoni*) ... 16, *17*, **152–154**
—, Eastern Grass (*Tyto longimembris*) ... 358
—, Japanese Scops (*Otus semitorques*) ... 154
—, Long-eared (*Asio otus*) ... 154
—, Oriental Scops (*Otus sunia*) ... 154
—, Ryukyu Scops (*Otus elegans*) ... 65
—, Short-eared (*Asio flammeus*) ... 154
—, Ural (*Strix uralensis*) ... 154, *154*, 357
Oyashio Current ... 38, 73, 202, 353
Oze National Park ... *239*

P

Palaearctic Region ... 104, 109, 257, 301, 353, 354, 356, 359, 360
Palm, Japanese Sago (*Cycas revoluta*) ... 57, 315
—, Mangrove (*Nypa fruticans*) ... 330
—, Yaeyama (*Satakentia liukiuensis*) ... 318
Paperplant, Glossy-leaf (*Fatsia japonica*) ... 79
Parakeet, Rose-ringed (*Psittacula krameri*) ... 351
Park, **Kasai Marine** ... 212
Partridge, Chinese Bamboo (*Bambusicola thoracicus*) ... 66, *223*
Peafowl, Indian (*Pavo cristatus*) ... 284, 285
Peninsula, **Boso** ... 38, 256, 337
—, **Kii** ... 256
—, **Nemuro** ... 52, 198
—, **Noto** ... 212, 361
—, **Osumi** ... 273
—, **Shimokita** ... 98, 139, 253, 260, 265
—, **Shiretoko** ... 30, *38*, 47, 96, 121, 129, 136, 140, *144*, *145*, 146, 158, 162, *163*, **165–166**, *170*, 174, 198, 202, 204, 232, 233, *352*
Penstemon, Shrub-like (*Penstemon frutescens*) ... 155
Petaltail, Pryer's (*Tanypteryx pryeri*) ... 92, *93*
Petrel, Band-rumped Storm (*Oceanodroma castro*) ... 359
—, Bonin (*Pterodroma hypoleuca*) ... 74, 360
—, Bulwer's (*Bulweria bulwerii*) ... 360
Petrel, Leach's Storm (*Oceanodroma leucorhoa*) ... 74, 359
—, Matsudaira's Storm (*Oceanodroma matsudairae*) ... 74, *334*, 358, 360
—, Swinhoe's Storm (*Oceanodroma monorhis*) ... 358, 359
—, Tristram's Storm (*Oceanodroma tristrami*) 74
Phalarope, WiIson's (*Phalaropus tricolor*) ... 357
Pheasant, Copper (*Syrmaticus soemmerringii*) ... 63, 134, 212, **222–223**, 357, 358
—, Green (*Phasianus versicolor*) ... *66*, *67*, 70, 134, 212, **222–223**, 358, 359
Photography ... **146–147**
Pig (*Sus scrofa domesticus*) ... 270, 324
Pigeon, Feral (*Columba livia*) ... 71
—, Japanese Wood (*Columba janthina*) . 339, 358
—, Ryukyu Green (*Treron permagnus*) ... 65, 302, *308*, 360
—, White-bellied Green (*Treron sieboldii*) ... 15, 116, *117*
Pika, Northern (*Ochotona hyperborea*) ... 137, 155, **246–250**, 257, 354
Pine, Bonin Screw (*Pandanus boninensis*) ... 83
—, Bristlecone (*Pinus longaeva*) ... 310
—, Dwarf Siberian (*Pinus pumila*) ... 31, *60*, 82, 165, 191, 261
—, Fern (*Podocarpus macrophyllus*) ... 79
—, Japanese Black (*Pinus thunbergii*) . 79, 83, 214
—, Japanese Red (*Pinus densiflora*) ... *30*, 31, 79, 83, 214, 274
—, Japanese Stone (*Pinus pumila*) ... 31, *60*, 82, 165, 191, 261
—, Screw (*Pandanus odoratissimus*) ... 83
Pintail, Northern (*Anas acuta*) ... *224*, 280
Pipistrelle, Bonin (*Pipistrellus sturdeei*) ... 355
—, Endo's (*Pipistrellus endoi*) ... *354*
Pipit, Olive-backed (*Anthus hodgsoni*) ... 234
Pitta, Fairy (*Pitta nympha*) ... 63, 274, 359
Plain, **Ishikari** ... 36
—, **Kantō** ... 33, 34, 36, 43, 280
—, **Nōbi** ... 36
—, **Ōsaka** ... 36
—, **Tokachi** ... 36
Plate Tectonics ... **18–23**
Play behaviour ... **230–233**
Plinius Secundus, Gaius (Pliny the Elder) ... 290
Plover, Long-billed (*Charadrius placidus*) ... 68, *69*, 281, *282*
Pollock, Walleye (*Theragra chalcogramma*) ... 143, 172

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Population **9**
Porpoise, Dall's (*Phocoenoides dalli*) 97, 140, *144*, 146
—, Harbour (*Phocoena phocoena*) 98, 146
—, Indo-Pacific Finless (*Neophocaena phocaenoides*) 140, 214
Prefecture, **Aichi** 36, 102, 242
—, Aomori 98
—, Chiba 29, 256, 280, 351
—, Gifu 36, 191, 221, 222, 242
—, Kagoshima 34, *70*, 277
—, Kōchi 52, 140
—, Kyōto 214
—, Miyagi 104, 136, 139, 224
—, Nagano 30, 36, *67*, 98, 139, 212, 237, 239, 242, 244, 250, *251*, 253, 260, 280
—, Niigata 36, 70, 104, 191, 239, 280
—, Saga 80
—, Shiga 59
—, Shizuoka 242, 244, 331
—, Tochigi *66*, 239
—, Tottori 10, 59, 80, 127, 214, *215*
—, Wakayama 256
—, Yamagata 239
—, Yamaguchi 217
—, Yamanashi 191, 239, 242, 244, 260
Primrose, Wedgeleaf (*Primula cuneifolia*) 155
Pryer, Henry 15
Ptarmigan, Rock (*Lagopus muta*) 60, *61*, 134, 239, 246, *249*, 250, 360
Pufferfish, Tiger (*Takifugu rubripes*) 217
Puffin, Atlantic (*Fratercula arctica*) 183
—, Horned (*Fratercula corniculata*) 183
—, Tufted (*Fratercula cirrhata*) *74*, 183, 359
Pygmyfly, Northern (*Nannophya pygmaea*) *93*

Q

Quasi National Park, **Akiyoshidai** *216*, 217
—, Nishi-Chūgoku Sanchi 217
—, Ō-numa 186

R

Rabbit, Amami (*Pentelagus furnessi*) 90, *91*, *95*, 129, 257, *302*, 304, 306, **312–314**, 352, 353
—, European (*Oryctolagus cuniculus*) *257*
Raccoon, North American (*Procyon lotor*) *123*, 124, 270, 355
Rail, Okinawa (*Gallirallus okinawae*) 65, 95, 290, 303, *307*, 315, 317, **318–321**, 358, 360
Rainy Season 25, *34*, 41, *42*, 43, 44, 264, 273
Ramsar Sites 124, 127, 311, 331
Rat, Amami Spiny (*Tokudaia osimensis*) 304, *305*, 312
—, Brown (or Norway) (*Rattus norvegicus*) *104*, 271
—, Okinawa Spiny (*Tokudaia muenninki*) 304, *305*, 312
—, Ryukyu Long-haired (*Diplothrix legata*) 90, *305*, 306, 312
—, Tokunoshima Spiny (*Tokudaia tokunoshimensis*) 312
Ratsnake, Four-lined (=Japanese Striped Snake *Elaphe quadrivirgata*) *326*
—, Japanese (*Elaphe climacophora*) *326*, 327
Rausu 165
Raven, Northern (*Corvus corax*) 102, 159, **230–233**
Ray, Reef Manta (*Mobula alfredi*) 318
Rebun Island 134, 181
Red Data Book of Japan 123
Redpoll, Common (*Acanthis flammea*) 112, *113*
Redshank, Common (*Tringa totanus ussuriensis*) 359
Redstart, Daurian (*Phoenicurus auroreus*) *284*
Reed Warbler, Black-browed (*Acrocephalus bistrigiceps*) 66, *69*, 167
—, Oriental (Acrocephalus orientalis) 66, 234
Reed, Common or Japanese (*Phragmites australis* or *P. japonicus*) 82
Region, **Chūbu** 212
—, Chūgoku 43, 217
—, Kansai 36, 212, 214
—, Kantō 29, 33, 34, 36, 43, 212, 280
—, Kinki 43
—, Oriental 10, 301, 354, 355, 356, 359, 360
—, Palaearctic 104, 109, 257, 301, 353, 354, 356, 359, 360
—, San'in 82
—, Tōhoku 23, 29, 30, 43, 82, 210, 239
—, Tōkai 43
Rhinoceros, Indian (*Rhinoceros unicornis*) 265
Rhododendron, Japanese (*Rhododendron brachycarpum*) 152
Ring of Fire 21, 24, 152
Rishiri Fuji 181, 182
Rishiri Island 74, 134
Rishiri–Rebun–Sarobetsu National Park 181
River, **Azusa** *244*
—, Ishikari 280
—, Kushiro 167
—, Maruyama 214
—, Shinano 36, 280

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River, Tone ... 212, 280
Robin, Izu (*Larvivora tanensis*) ... 134, *335*, 339, 358, 360
—, Japanese (*Larvivora akahige*) ... 60, *308*, 358
—, Okinawa (*Larvivora namiyei*) ... *76*, 302, 321, 358, 360
—, Ryukyu (*Larvivora komadori*) ... 65, *308*, 311, 358, 360
—, Siberian Blue (*Larvivora cyane*) ... *284*, 357
Rook, Eastern (*Corvus pastinator*) ... *286*, 357
Rose, Japanese Beach (*Rosa rugosa*) ... 83
Rosefinch, Long-tailed (*Carpodacus sibiricus*) ... 66, 112, *113*, 359
—, Pallas's (*Carpodacus roseus*) ... 112, *113*
Rowan, Japanese (*Sorbus commixta*) ... 106, 155
Rubythroat, Siberian (*Luscinia calliope*) ... 60, 137, *138*, 155, *234*, 359
Ryūkyū Islands ... 301, 302, 303

S

Sable (*Martes zibellina*) ... 191, **197–199**
Sado Island ... 38, *70*, 71, 100, 104, 130, 212, 258
Saga Prefecture ... 80
Saikai National Park ... 273
Sakura-jima ... 26, 27, 34, 134, 273, *274*
Salamander, Chikushi Spotted (*Hynobius oyamai*) ... 102
—, Ezo (*Hynobius retardatus*) ... 102
—, Hokkaidō (*Hynobius retardatus*) ... 102
—, Japanese Black (*Hynobius nigrescens*) ... *101*
—, Japanese Clawed (*Onychodactylus japonicus*) ... *101*, 102
—, Japanese Giant (*Andrias japonicus*) ... 14, *15*, 16, 92, 100, 214, 239, **267–269**
—, Mikawa (*Hynobius mikawaensis*) ... 102
—, Stejneger's (*Hynobius stejnegeri*) ... 102
Salmon, Chinook (or King Salmon) (*Oncorhynchus tshawytscha*) ... 175
—, Cherry (or Masu Salmon) (*Oncorhynchus masou*) ... 175
—, Chum (or Dog Salmon) (*Oncorhynchus keta*) ... 166, **174–175**
—, Coho (or Silver Salmon) (*Oncorhynchus kisutch*) ... 175
—, Dog (or Chum Salmon) (*Oncorhynchus keta*) ... 166, **174–175**
—, Humpback (or Pink Salmon) (*Oncorhynchus gorbuscha*) ... 166, **174–175**
—, King (or Chinook Salmon) (*Oncorhynchus tshawytscha*) ... 175
—, Masu (or Cherry Salmon) (*Oncorhynchus masou*) ... 175
Salmon, Pink (or Humpback Salmon) (*Oncorhynchus gorbuscha*) ... 166, **174–175**
—, Red (or Sockeye Salmon) (*Oncorhynchus nerka*) ... 175
—, Silver Salmon (or Coho Salmon) (*Oncorhynchus kisutch*) ... 175
—, Sockeye (or Red Salmon) (*Oncorhynchus nerka*) ... 175
Saltwort (*Salsola komarovii*) ... 82
San'in Kaigan Geopark ... 129, 214
San'in Kaigan National Park ... 214
San'in Region ... 82
Sand Lance, Japanese (*Ammodytes personatus*) ... 183
Sandan-kyō ... *217*
Sandpiper, Common (*Actitis hypoleucos*) ... 281
—, Green (*Tringa ochropus*) ... 281
Sarobetsu ... 181
Sasa (*Sasa veitchii*) ... 66, 151
Sasanka, Japanese (or Sasanqua) (*Camellia sasanqua*) ... 296, *297*
Satoyama ... 70, *71*
Scoter, Black (*Melanitta americana*) 118, *119*, 204
—, Siberian (or Stejneger's) (*Melanitta stejnegeri*) ... 118
Sea Angel (*Clione limacina*) ... *47*
Sea Lion, Japanese (*Zalophus japonicus*) .. 50, 355
—, Steller's (*Eumetopias jubatus*) .. 40, *50*, **202–205**
Sea of Japan ... 23, 24, 25, 28, 36, 38, 41, 43, 46, 59, 60, 74, 90, 134, 150, 202, 209, 210, 212, 214, 224, 237, 239, 249, 286, 296, 356, 361
Sea of Okhotsk ... 20, 28, 38, 46, 50, 55, 59, 60, 139, 143, 152, 159, 165, 166, 170, 172, 202, 204, 205, 224, 353, 358, 361
Sea-ice ... **46–49**
Sea, Inland ... 38, 43, 214, *272*, 322
Seal, Bearded (*Erignathus barbatus*) . 50, *206*, 207
—, Kuril (*Phoca stejnegeri*) ... 50, *202*, *206*, 207
—, Largha (*Phoca largha*) ... *50*, **202–207**
—, Northern Fur (*Callorhinus ursinus*) ... 40, *50*, 98, **202–205**
—, Ribbon (*Histriophoca fasciata*) ... 50, *207*
—, Ringed (*Pusa hispida*) ... 50, 206
—, Spotted (=Largha Seal *Phoca largha*) ... *50*, **202–207**
—, West Pacific Harbour (=Kuril Seal *Phoca stejnegeri*) ... 50, *202*, *206*, 207
Season, Rainy ... 25, *34*, 41, *42*, 43, 44, 264, 273
—, Typhoon ... 25, *34*, 41, *44*, 237, 280
Sedge, Asiatic Sand (*Carex kobomugi*) ... 82, 214
—, Hoppner's (*Carex subspathacea*) ... 82

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Seebohm, Henry ... 15
Sekisei Lagoon ... 318
Senkaku Islands ... 343, 360
Sequoia, Giant (*Sequoiadendron giganteum*) . 309
Serow, Japanese (*Capricornis crispus*) ... *5*, 10, 16, 30, 98, *99*, 101, 123, 134, 139, *141*, 237, 239, *242*, 246, **264–267**
Setonaikai ... 38, 43, 214, *272*, 322
Shark, Great Hammerhead (*Sphyrna mokarran*) ... 318
—, Hammerhead (Sphyrnidae) ... 98
—, Smooth Hammerhead (*Sphyrna zygaena*) ... 318
—, Whale (*Rhincodon typus*) ... 318
Shearwater, Bryan's (*Puffinus bryani*) ... 74
—, Short-tailed (*Puffinus tenuirostris*) *53*, *54*, 136
—, Streaked (*Calonectris leucomelas*) ... *53*, *54*, 55, 73, 333, *334*, 337, 340, 358
Sheep (*Ovis aries*) ... 270
Shelduck, Common (*Tadorna tadorna*) . 280, *282*
Shiga Prefecture ... 59
Shikoku ... **273–298**
Shimokita Peninsula ... 98, 139, 253, 260, 265
Shimonoseki City ... 217
Shinano River ... 36, 280
Shinmoe-dake ... *22*, 134
Shintō ... 209, 243, 270
Shirakami Mountains ... 129, *209*, 210
Shirakami Sanchi ... 129, *209*, 210
Shiretoko National Park ... 97, **165–167**
Shiretoko Peninsula ... 30, *38*, 47, 96, 121, 129, 136, 140, *144*, *145*, 146, 158, 162, *163*, **165–166**, 170, *170*, 174, 198, 202, 204, 232, 233, *352*
Shizuoka Prefecture ... 242, 244, 331
Short, Lester ... 320
Shoveler, Northern (*Spatula clypeata*) ... 359
Shōwa Shinzan ... 26, 186, *187*
Shrew Mole, Japanese (*Urotrichus talpoides*) .. *201*
Shrew, Eurasian Least (*Sorex minutissimus*) ... *89*, **200–201**
—, House (*Suncus murinus*) ... *200*
—, Lesser Pygmy (=Eurasian Least Shrew *Sorex minutissimus*) ... *89*, **200–201**
—, Long-clawed (*Sorex unguiculatus*) ... *201*
—, Shinto (*Sorex shinto*) ... *201*
Shrews ... **200–201**
Shrike, Bull-headed (*Lanius bucephalus*) ... 234, **292–293**
—, Northern (*Lanius borealis*) ... 292, *293*
—, Tiger (*Lanius tigrinus*) ... *293*, 359
Shrine, Itsukushima ... *216*, 217, 326
—, Meiji ... *212*
—, Tōshōgū ... 239, *243*
Siebold, Philipp Franz Balthasar von ... 4, **12–17**, 268, 296
Silk Road ... 214
Silvergrass, Maiden (*Miscanthus sinensis*) ... 66
Silvertop, Beach (*Glehnia littoralis*) ... 214
Siskin, Eurasian (*Spinus spinus*) ... *113*
Skimmer, Bonin (*Boninthemis insularis*) ... *334*
—, White-tailed (*Orthetrum albistylum*) ... *93*
Skink, Japanese (*Plestiodon japonicus*) ... 267
—, Ogasawara Snake-eyed (*Cryptoblepharus nigropunctatus*) ... 336, 349
Skua, South Polar (*Stercorarius maccormicki*) ... *361*
Slider, Red-eared (*Trachemys scripta*) ... *351*
Smew (*Mergellus albellus*) ... 359
Snail, Ani Island Mandarina (*Mandarina anijimana*) ... *336*
—, East African Land (*Achatina fulica*) ... 351
Snake, Brown Tree (*Boiga irregularis*) ... 307, 336
—, Japanese Coral (*Sinomicrurus japonicus*) . *327*
—, Japanese Striped (*Elaphe quadrivirgata*) ... *326*
—, Pryer's Keelback (*Hebius pryeri*) ... 303
—, Ryukyu Green (*Cyclophiops semicaricartus*) ... *327*
—, Ryukyu Odd-tooth (*Lycodon semicarinatus*) ... *326*
Snipe, Common (*Gallinago gallinago*) ... *168*
—, Greater Painted (*Rostratula benghalensis*) ... *71*, 359, 360
—, Latham's (*Gallinago hardwickii*) ... 66
—, Pin-tailed (*Gallinago stenura*) ... 168, *169*
—, Solitary (*Gallinago solitaria*) ... 168, *169*
—, Swinhoe's (*Gallinago megala*) ... 168
Snow, Henry ... 51
Soils ... **31**
Someiyoshino (=Yoshino Cherry *Prunus yedoensis*) ... 79, *85*
Sōya Current ... 38
Sōya Strait ... 150, 359
Spangle, Long-tailed (*Papilio macilentus*) ... 109
Sparrow, Eurasian Tree (*Passer montanus*) ... 71, **122**, 140, 359
—, House (*Passer domesticus*) ... 122
—, Russet (*Passer rutilans*) ... *122*
Sparrowhawk, Chinese (*Accipiter soloensis*) ... 74, 361
—, Eurasian (*Accipiter nisus*) ... 159
—, Japanese (*Accipiter gularis*) ... 63

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Spindle, Japanese (*Euonymus japonicus*) 79
Spoonbill, Black-faced (*Platalea minor*) 68, *275*, *325*
Sprite, Orange-tailed (*Ceriagrion auranticum*) 301, *301*
Spruce, Ezo (*Picea jezoensis*) 151
Spruce, Sakhalin (*Picea glehnii*) 83
Squirrel, Eurasian Red (*Sciurus vulgaris*) *188*, **189–190**
—, Five-striped Palm (*Funambulus pennantii*) 191
—, Japanese (*Sciurus lis*) *99*, 100, 189, **218–220**, 353
—, Japanese Flying (*Pteromys momonga*) *90*, *189*, 195, 218, *219*, 220
—, Japanese Giant Flying (*Petaurista leucogenys*) *88*, 100, 134, *136*, 189, 212, 218, *219*, 220
—, Pallas's (*Callosciurus erythraeus*) *188*, 189, 218, *219*, 355
—, Siberian Flying (*Pteromys volans*) 100, 156, 189, 190, **194–196**, 218, 353
Starling, Chestnut-cheeked (*Agropsar philippensis*) *108*, 357, 358
—, Common (*Sturnus vulgaris*) *108*
—, White-cheeked (*Spodiopsar cineraceus*) 70, 71, **108**
Steller, Georg Wilhelm 170
Steppe-tundra 89
Stoat (*Mustela erminea*) 197
Stonechat, Stejneger's (*Saxicola stejnegeri*) 66, *284*
Stork, Oriental (*Ciconia boyciana*) 6, 71, 100, 130, *131*, 214, 335, 359
Strait, La Pérouse 38, 150, **46–49**
—, **Nemuro** 52, 136, 140, 143, 146, 165, 170, 204
—, **Sōya** 150, 359
—, **Tokara** 38, 304, 311, 353, 355
—, **Tsugaru** 16, 38, 98, 150, 152, 162, 186, 218, 253, 260, 354, 356
Stubtail, Asian (*Urosphena squameiceps*) 66, 234, *291*
Sun goddess 134
Swallow, Barn (*Hirundo rustica*) 285, *289*
—, Pacific (*Hirundo tahitica*) 360
—, Red-rumped (*Cecropis daurica*) 360
—, White-breasted Wood (*Artamus leucorynchus*) 358
Swan, Bewick's (*Cygnus bewickii*) 73, **176–177**, 214, *216*, 224, 280, 359
—, Mute (*Cygnus olor*) *177*
—, Whooper (*Cygnus cygnus*) 53, 73, 136, 139, 152, 158, **176–177**, 224, *225*
Sweetfish (*Plecoglossus altivelis*) 221
Swift, House (*Apus nipalensis*) 360

T

Tairo-ike 339
Tanega-shima 38, 104, 300
Tanuki (*Nyctereutes procyonoides*) 98, 228, 242, **258–259**, 265, 304, *353*
Tateshina 134, 212
Tattler, Grey-tailed (*Tringa brevipes*) 276
Tea (*Camellia sinensis*) 297
Teal, Baikal (*Anas formosa*) 224, *225*
—, Eurasian (*Anas crecca*) 224
Tern, Black-naped (*Sterna sumatrana*) 74, 360
—, Bridled (*Onychoprion anaethetus*) 318
—, Greater Crested (*Thalasseus bergii*) 360
—, Roseate (*Sterna dougallii bangsi*) 74, 360
—, Sooty (*Onychoprion fuscatus*) 74, 360
Teuri Island | Teuri-tō 74, 181, **182–185**, 357
The Wildlife Protection and Hunting Law 204
Thistle, Kirishima (*Saussurea scaposa*) 134
Three-Level Gorge *217*
Thrush, Amami (*Zoothera major*) 65, 303, *304*, 307, 311, 358, 360
—, Brown-headed (*Turdus chrysolaus*) 60, **110–111**, 358
—, Dusky (*Turdus eunomus*) **110–111**, 357
—, Eastern Blue Rock (*Monticola philippensis*) 73, 116, *117*
—, Eyebrowed (*Turdus obscurus*) 110, *111*
—, Izu (*Turdus celaenops*) 134, 333, *335*, 339, 360
—, Japanese (*Turdus cardis*) 60, 110, *111*, 357
—, Mistle (*Turdus viscivorus*) 358
—, Pale (*Turdus pallidus*) 110, *111*
—, Siberian (*Geokichla sibirica*) 60, 110, *111*
—, White's (*Zoothera aurea*) 60, *110*
Thujopsis (*Thujopsis dolobrata*) 31, 83
Thunberg, Carl Peter 4, **12–17**
Tickell, W. L. N. 343
Tiger, Bengal (*Panthera tigris*) 265
Tip, Orange (*Anthocharis cardamines*) 239
Tit, Great (*Parus major*) 243
—, Japanese (*Parus minor*) *243*, 295, 359
—, Long-tailed (*Aegithalos caudatus*) *289*
—, Marsh (*Poecile palustris*) *243*, 359
—, Orii's (*Sittiparus olivaceus*) 243, 358
—, Owston's (*Sittiparus owstoni*) 95, 134, *137*, *243*, *335*, 339, 358, 360
—, Varied (*Sittiparus varius*) 95, **243**, 295, 357, 358
—, Willow (*Poecile montanus*) 243

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Toad, East Japanese (*Bufo japonicus*) *237*, 239
—, Japanese Stream (*Bufo torrenticola*) ... *237*, 239
—, Narrow-mouthed (*Microhyla okinavensis*) 303
Tochigi Prefecture *66*, 239
Tōhoku Region 23, 29, 30, 43, 82, 210, 239
Tokachi Plain 36
Tōkai Region 43
Tokara Strait 38, 304, 311, 353, 355
Tokugawa Hidetada 296
Tokuno-shima 129, 300, 305, 307, 312, 313
Tōkyō 14, 29, 33, 34, 43, 71, *72*, 86, 134, 160, 162, 333
Tōkyō Bay 34, 212, 280
Tomakomai City 286
Tone River 212, 280
Tori-shima *27*, 28, 130, 334, 337, **340–347**
Tortoiseshell, Small (*Aglais urticae*) 109
Tōshōgū Shrine 239, *243*
Tottori Prefecture 10, 59, 80, 127, 214, *215*
Toyooka City 214
Tree, Amur Cork (*Phellodendron amurense*) . 152
—, Brush Pot (*Cyathea lepifera*) 317
—, Camphor (*Cinnamomum camphora*) 79, **80–81**
—, Cinnamon (*Cinnamomum zeylanicum*) 80
—, Isu (*Distylium racemosum*) 274, 310
—, Japanese Bay (*Machilus thunbergii*) 79, 300
—, Maidenhair (=Ginkgo *Ginkgo biloba*) 13, *85*, **86–87**
—, Octopus (*Pandanus boninensis*) *349*
—, Prickly Castor-oil (*Kalopanax pictus*) ... 83, 151
Trillium, Kamchatkan (*Trillium camschatcense*) *166*
Trough, **Okinawa** 23, 299
Trout, Steelhead (*Oncorhynchus mykiss*) 175
Tsugaru Current 38
Tsugaru Strait | Tsugaru Kaikyo 16, 38, 98, 150, 152, 162, 186, 218, 253, 260, 354, 356
Tsunami **28–29**
Tsurui Village 181
Tsushima 38, 52, 74, 134, 197, 271, *275*, 278, 353, 354
Tsushima Current 38, 214
Turtle, Black-breasted Leaf (*Geoemyda japonica*) *319*
—, Common Snapping (*Chelydra serpentina*) 351
—, Green (*Chelonia mydas*) 98, 311, 318
—, Loggerhead (*Caretta caretta*) *310*, 311, 318
—, Ryukyu Box (or Yellow-margined Box) (*Cistoclemmys evelynae*) *319*
Typhoon Season 25, *34*, 41, *44*, 237, 280

U

UNESCO World Heritage Site 129, 308, 351
Unzen Volcano Area Geopark 26, 129
Unzen–Amakusa National Park 273
Utari . 51, 97, 149, 150, 152, 163, 164, 167, 192, 262
Utoro 97, 165

V

Vegetation **77–87**
Viburnum, Forked (*Viburnum furcatum*) 152
—, Siebold's (*Viburnum sieboldii*) 15
Village, **Akan** 181
—, **Tsurui** 181
Vine, Silver (*Actinidia polygama*) 152
Violet, Dogtooth (*Erythronium japonicum*) *249*, 250
Viper, Japanese Pit (=Japanese Mamushi *Gloydius blomhoffii*) *327*
Vitex, Beach (*Vitex rotundifolia*) 83, 214
Volcano **23–28**, 31, 186, 336, 338
Volcano, **Aira** 273
Vole, Grey Red-backed (*Myodes rufocanus*) ... *105*
—, Hokkaidō Red-backed (*Myodes rex*) 306
Vulcanology | Vulcanism **23–28**, 31, 186, 336, 338

W

Wagtail, Eastern Yellow (*Motacilla tschutschensis*) *325*
—, Grey (*Motacilla cinerea*) 68
—, Japanese (*Motacilla grandis*) 68, 281, *282*, 358
—, White (*Motacilla alba*) 102, *103*
Wakayama Prefecture 256
Wakkanai City 47, 185
Wakoto 158
Walnut, Japanese (*Juglans ailantifolia*) 151
Walrus (*Odobenus rosmarus*) 50, 207
Wapiti, North American (*Cervus canadensis*) 321
Warbler, Black-browed Reed (*Acrocephalus bistrigiceps*) 66, *69*, 167
—, Eastern Crowned (*Phylloscopus coronatus*) 234
—, Ijima's Leaf (*Phylloscopus ijimae*) 333, *335*, 339, 358
—, Lanceolated (Grasshopper) (*Locustella lanceolata*) 66, 102
—, Middendorff's Grasshopper (*Locustella ochotensis*) 66, *101*, 102
—, Oriental Reed (*Acrocephalus orientalis*) 66, 234

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Warbler, Sakhalin Grasshopper (*Locustella amnicola*) 66, *101*, 102, 359
—, Sakhalin Leaf (*Phylloscopus borealoides*) 60
—, Styan's Grasshopper (*Locustella pleskei*) *339*, 340
—, Wood (*Phylloscopus sibilatrix*) 358
Watase's Line 354, 355
Watercock (*Gallicrex cinerea*) 307
Waterhen, White-breasted (*Amaurornis phoenicurus*) 307, *307*, 360
Waxwing, Bohemian (*Bombycilla garrulus*) **106–107**
—, Japanese (*Bombycilla japonica*) **106–107**, *288*
Weasel, Japanese (*Mustela itatsi*) 197, *198*, 338, *339*, 351
—, Least (*Mustela nivalis*) 197, *198*, 199
—, Siberian (*Martes sibirica*) 197
Weston, Walter 100, **245**, 262
Wetlands **68–69**
Wetlands, **Hachigoro Toshima** 214
Whale-watching **140–146**
Whale, Baird's Beaked (*Berardius bairdii*) 98, 144
—, Blue (*Balaenoptera musculus*) 140
—, Bryde's (*Balaenoptera brydei*) *144*
—, Fin (*Balaenoptera physalus*) *144*
—, Great Sperm (*Physeter macrocephalus*) 98, *142*, 143, 144, 146
—, Grey (*Eschrichtius robustus*) 144
—, Humpback (*Megaptera novaeangliae*) *40*, 143, 144, *145*, 146, *147*, 315, 317
—, Killer (=Orca *Orcinus orca*) 98, 136, *142*, 143, 144, *145*, 146, *352*
—, Northern Minke (*Balaenoptera acutorostrata*) 97, 98, 136, 140, 143, 144, *145*, 146, 165
—, Short-finned Pilot (*Globicephala macrorhynchus*) 98
White-eye, Bonin (=Bonin (Island) Honeyeater *Apalapteron familiare*) 65, *75*, 95, 334, 336, *339*, 358, 360
—, Japanese (*Zosterops japonicus*) *75*, *288*, *296*, 297, 340, 357, 359
Wigeon, Eurasian (*Mareca penelope*) 224, 280
Willow, Bakko's (*Salix bakko*) 83
Wingnut, Japanese (*Pterocarya rhoifolia*) 151
Wolf, Grey (*Canis lupus*) 123, 262, 264, 355
—, Hokkaidō (*Canis lupus hattai*) *125*
—, Japanese (*Canis lupus hodophilax*) *125*
Woodcock, Amami (*Scolopax mira*) 303, *307*, 358, 360
—, Eurasian (*Scolopax rusticola*) 168, *169*, 307
Woodpecker, Black (*Dryocopus martius*) 60, 156, *159*, 294, *295*
—, Eurasian Three-toed (*Picoides tridactylus*) 359
—, Great Spotted (*Dendrocopos major*) 60, *294*
—, Grey-headed (*Picus canus*) 63, 294, *295*, 359
—, Japanese (*Picus awokera*) 63, 294, *295*, 311, 357, 358
—, Japanese Pygmy (*Yungipicus kizuki*) 60, 156, 195, *196*, *294*, 311, 340, 358, 359, 360
—, Lesser Spotted (*Dryobates minor*) 294, *295*
—, Owston's (*Dendrocopos owstoni*) 65, *294*, *300*, 303, 311, 358, 360
—, Pryer's (*Dendrocopos noguchii*) *65*, 95, *294*, 302, 303, 307, 317, 318, *319*, 321, 358, 360
—, White-backed (*Dendrocopos leucotos*) 60, *294*
Woodpeckers **294–295**
Wormwood, Asian Coastal (*Artemisia fukudo*) 82
—, Steller's (*Artemisia stelleriana*) 83
Wryneck, Eurasian (*Jynx torquilla*) *295*, 359

Y

Yaeyama Islands *34*, 38, 92, 109, 200, 243, 301, 315, 317, *319*, 320, 325, 347, 354, 360
Yaku-shima 104, *133*, *134*, *135*, 253, 274, 300, 302, **308–311**, 321, 322, 326, 327, 360
Yaku-sugi (=Japanese Cedar *Cryptomeria japonica*) 31, 133, *134*, *308*, 310
Yamagata Prefecture 239
Yamaguchi Prefecture 217
Yamanashi Prefecture 191, 239, 242, 244, 260
Yamashina Institute for Ornithology 320, 346, 361
Yamashina Yoshimaro 340, 342, 343
Yambaru *10*, *76*, 92, 95, *316*, 317, 320
Yambaru National Park 317
Yanbaru *10*, *76*, 92, 95, *316*, 317, 320
Yellowthroat, Common (*Geothlypis trichas*) 358
Yew, Japanese (*Taxus cuspidata*) 214
Yokohama 15, 29, 160, 207
Yonaguni Island | Yonaguni-jima 33, 315, 360
Yoshii Masashi 343

Z

Zelkova, Japanese (*Zelkova serrata*) 79, 217
Zygoptera 92

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