HKU KE IP 2011/12-52 September 2013

A Review of Hong Kong's Wild Animal and Plant Protection Laws

Amanda S. Whitfort BA (Hons), LLB, LLM*
Andrew Cornish Ph. D **
Rupert Griffiths PgDip ***
Fiona M. Woodhouse BA (Hons), MA, VetMB, MRCVS****

*Associate Professor, Faculty of Law, The University of Hong Kong.
** Ecological Consultant, Cornerstone Ecology
***Animal Welfare Management Consultant, Greenwing Ltd.
**** Deputy Director (Welfare), Society for Prevention of Cruelty to Animals (Hong Kong).

EXECUTIVE SUMMARY

Hong Kong has a rich terrestrial, freshwater and marine biodiversity, and a long history of legislation going back to 1870 to protect aspects of it. However, over the past fifteen years, experts have noted that a variety of loopholes exist which deny a holistic legislative approach to conserving biodiversity. Some of these loopholes were intentional and reflect historical perspectives, others unintentional and represent a failure to keep abreast of emerging threats. Some suggestions have been made from a conservation perspective as to how to improve the law, but no formal review has taken place until now, let alone one incorporating legal expertise.

Given that context, the review comprises an analysis of the existing legislation for conserving terrestrial, freshwater and marine native fauna and flora in Hong Kong, with the aims of making recommendations to the HKSAR Government for law reform, and enhancing understanding in the conservation community. It is intended to feed into the process of formulating Hong Kong's first Biodiversity Strategy and Action Plan (BSAP) under the Convention of Biological Biodiversity (CBD), which Hong Kong joined through an extension of China's CBD membership in 2011. Formulation of the BSAP will take place from 2013-14.

In this review, we consider the effectiveness of the Wild Animals Protection (Cap. 170), Forests and Countryside (Cap. 96), Fisheries Protection (Cap. 171), Country Parks (Cap. 208) and Marine Parks (Cap. 476) Ordinances in protecting wild, native species in Hong Kong. We make a variety of recommendations to update and unify these Ordinances with regards to protecting species of conservation concern, and assert how these can inform the Environmental Impact Assessment Ordinance (Cap. 499). We have also provided some general comment on the enforcement of these Ordinances with regards to protecting wild, native species. However we have not analysed whether the levels of punishment for non-compliance are sufficiently high to provide a deterrent, or analysed in detail the effectiveness of specific types of enforcement, as such analyses are beyond the scope of this study.

In total, we make 15 Recommendations for legislative amendments involving:

- The creation of a "List of Hong Kong Species of Conservation Concern" which includes fauna and flora, and is periodically updated and used to inform lists of protected species under all relevant Ordinances.
- The addition of freshwater fishes, and marine fishes and invertebrates to lists of protected species, via the List of Hong Kong Species of Conservation Concern.
- Improved measures to manage invasive alien species.
- Prevention of new public actions against non-protected species through potential loopholes in the definition of 'hunting.'
- Increased controls for the possession of protected wild animals.
- Additional protection for protected plant species on private land.
- Making allowances for accidental interactions with protected marine species (i.e. physical contact such as a collision with a boat, or accidental capture with a net that causes death, injury or stress to the animal).
- Improving the assessment of impacts to species under the Environmental Impact Assessment Ordinance.

The recommendations were formulated with the consensus of experts in the non-governmental conservation community. If followed, they will address all the major (and some more minor) areas required to unify and update the legislation protecting wild, native animals and plants for many years to come. Following the recommendations would be a major contribution not just to meeting with the standards of the CBD, but also to securing the long-term conservation and sustainable use of Hong Kong's rich biodiversity, if done in parallel with progressive policies, and the provision of sufficient resources for effective enforcement.

ACKNOWLEDGEMENTS

We wish to record our thanks to the staff of the Agriculture, Fisheries and Conservation Department, WWF-Hong Kong (Dr. Michael Lau, Alan Leung and Samantha Lee), Kadoorie Farm and Botanical Garden (Dr. Gary Ades, Paul Crow and Andrew Brown) and Ruy Barretto S.C., and staff of the University of Hong Kong's School of Biological Science (Professors David Dudgeon, Yvonne Sadovy and Gray Williams) for their assistance and advice to us in the course of preparing this review paper.

The review was supported by Hong Kong University's Knowledge Exchange Fund which is provided by the University Grants Committee.

TABLE OF CONTENTS

1. INTRODUCTION

The Hong Kong Government has long committed itself to the protection of specified kinds of wildlife through legislation going back to the Protection of Birds Ordinance of 1870, and a regulation to the Licensing Ordinance in 1913 that provided the first protection for certain plants (Dudgeon and Corlett 2004).

While a lot of information is known on many of the species naturally occurring in Hong Kong, it is not clear what the overall trends in Hong Kong's biodiversity have been in recent decades. The picture is clearer on land as several studies have identified biodiversity hotspots starting with The Biodiversity Survey of Hong Kong (completed by The University of Hong Kong in 2002). In addition, Fellows *et al.* (2002) listed for the first time the terrestrial and freshwater fauna of conservation concern of Hong Kong, using a suite of criteria ranging from the IUCN Red List global species status, to the number of localities a species was found within Hong Kong. While Fellows *et al.* needs to be updated as more than a decade has passed since it was published, the conservation status of most marine flora and fauna has never been determined.

What is known is that there remain many threats to biodiversity and wildlife in Hong Kong, and some are increasing in magnitude. On the terrestrial side, ongoing threats include deforestation, erosion, hunting, trapping, fires, pollution, the expansion of concrete environments (including stream channelisation), and alien invasive species (Dudgeon and Corlett 2004). The main threats to our natural coastlines and marine environment include organic and chemical pollution, dredging and reclamation, overfishing and destructive fishing practices (Sadovy and Cornish 2000), although all trawling in Hong Kong waters has been banned since 31 Dec 2012. Climate change is likely to pose further stress to a wide variety of habitats and species.

Hong Kong's original nature conservation legislation was drafted a considerable time ago. Some of the Ordinances have had sections updated over the years, but parts are now out of date and need to be reviewed. For example, the Wild Animals Protection Ordinance (WAPO) was drafted over 30 years ago and the list of animals protected under it has not been amended since 1996. As a result, there are some major inconsistencies between those species of most

conservation concern (e.g. rare, endemic, or in decline), and the degree of protection offered to different species under the law.

For example, experts have noted that while the list of animals on the WAPO probably includes most of the species that could be threatened by collecting or trapping, it also includes some common species and non-native species (see p. 16 for examples) but none of the freshwater fishes that are captured for the aquarium trade (Dudgeon and Corlett 2004). Furthermore, the legislation does not specifically recognize the need for management programmes to reduce populations of certain kinds of alien invasive species (such as the Red-eared Slider *Trachemys scripta elegans*, and Mile-a-minute creeper *Mikania micrantha*) that may threaten native species and habitats. Alien invasive species are defined as "non-native organisms that cause, or have the potential to cause, harm to the environment, economies, or human health" following the IUCN Invasive Species Specialist Group definition www.issg.org/database/welcome/content.asp).

A variety of plant species receive protection under the Forestry Regulations of the Forests and Countryside Ordinance. The list of protected plant species is less comprehensive than the protected animal species list, because it largely covers plants of high-altitude areas that are almost all included within Country Parks (Dudgeon and Corlett 2002), and hence protected by the Country Parks Ordinance.

The inadequacies of outdated legislation are even more extreme when considering the marine environment, which has an extent greater than that of Hong Kong's land area. While the WAPO lists a handful of large marine animals (i.e. whales and dolphins, marine turtles, dugongs), no marine fishes or invertebrates receive legislative protection; on the contrary, they are specifically excluded from inclusion under the WAPO, as animal is defined under WAPO as *any form of animal life other than fish and marine invertebrates*.

The objective of this report is to review local laws and makes recommendations to the HKSAR government for law reform, and to enhance understanding in the conservation community of the limitations of the existing legislation, and ways that it might be improved. In particular we

review the effectiveness of the Wild Animals Protection, Forests and Countryside, Fisheries Protection, Country Parks and Marine Parks Ordinances in protecting wild, native species in Hong Kong. We make a variety of recommendations to update and unify these Ordinances with regards to protecting species of conservation importance based on up-to-date conservation principles, and identify how these can inform the Environmental Impact Assessment Ordinance.

We have also provided some general comment on the enforcement of these Ordinances with regards to protecting wild, native species. However, we have not analysed whether the levels of punishment for non-compliance are sufficiently high to provide a deterrent, nor analysed the effectiveness of specific types of enforcement, as those issues are beyond the scope of this study.

In 2011, mainland China's membership of the United Nation's Convention on Biological Diversity (CBD) was extended to Hong Kong. The Convention requires members to develop and implement Biodiversity Strategies and Action Plans to protect biodiversity by 2015. The following seven-step process is recommended by CBD and has been adapted to the local context by Hopkinson (2012) as follows:

1. Identifying and Engaging Stakeholders
2. Assessing Hong Kong's Biodiversity and links with well-being
3. Developing a Strategy
4. Developing an Action Plan
5. Implementing the BSAP
6. Monitoring and Evaluating
7. Reporting

Reviewing the institutional framework for the conservation of native species including policies and legislation falls under Step 2 as follows:

2.3 Initiate development of a Hong Kong "Red List"

2.4 Review existing institutional framework for conservation

This present Report will also touch on the need to be able to differentiate invasive alien species from native species which, under the Hopkinson (2012) framework, falls under:

2.6 Review the drivers of biodiversity loss within and outside Hong Kong's borders.

2. METHODOLOGY

This study was explicitly intended to review wildlife legislation by bringing together expertise in both Hong Kong's legislature and local biodiversity and nature conservation. The combined knowledge of the authors was enhanced through desktop research and the input of and interviews with leading academics in terrestrial, freshwater and marine biodiversity, and senior experts from nature conservation organisations. Staff from the Agriculture, Fisheries and Conservation Department (AFCD), were also interviewed. Lastly, desktop research of other jurisdictions was conducted where it was felt that i) a conservation issue was relatively new, and thus not well provided for under existing legislation in Hong Kong; and, ii) a suite of measures might be adapted from the approaches and legislation of countries considered to be progressive, and with a history of managing similar issues.

3. THE ORDINANCES AND SUGGESTIONS FOR LAW REFORM

3.1 The Wild Animals Protection Ordinance, Cap 170

The purpose of this Ordinance is to *make provision for the conservation of wild animals, and for purposes connected therewith*. The Ordinance was first enacted in 1976.
On paper, at least, the Ordinance provides a solid legislative means to protect native fauna, barring a few loopholes and necessary updates to the list of protected species. The Ordinance has been instrumental in stopping widespread hunting activities in Hong Kong in the decades since it was introduced.

For the general public it has been a tool that has raised awareness about species that require special attention and has contributed to focusing conservation efforts on vulnerable species such

as the endemic Romer's Tree Frog (*Liuixalus romeri*). On a less positive note, being listed as protected has failed to prevent major declines and the possible future local extinction of a number of species, including the Green turtle (*Chelonia mydas*). This marine species migrates widely outside Hong Kong where it faces major threats, (see Box 1).

With regards to enforcement, the general view of those who provided expert input to this study seems to be that while enforcement has improved in some areas, they would like to see even broader enforcement activities and fuller utilisation of available legal enforcement structures. Closer liaison with other enforcement agencies would also be beneficial, in line with best practice in other jurisdictions.

Box 1. Green turtles (*Chelonia mydas*)

Green turtles are listed as Endangered on the IUCN Red List (Seminoff 2004). They occur around Hong Kong in the summer months, and used to lay eggs annually on a number of beaches. However, since the late 1990s, the only regularly used beach has been at Sham Wan on Lamma Island. In 1999, this beach was specified under the Wild Animals Protection Ordinance (Amendment of Schedule 6) Notice 1999 as a Restricted Area. The restricted period is from 1 June to 31 October, during which patrols are regularly conducted by AFCD staff to control unauthorized activities and to monitor the nesting activities of green turtles.

From a legislative perspective, Green turtles receive (or could receive if regulations were enacted) substantial protection. In addition to the beach at Sham Wan being a Restricted Area, they have been listed as a protected species under WAPO since 1980, as a Protected Marine and Coastal Species under the Marine Parks Ordinance since 1996, and as a species that could receive protection under the Fisheries Protection Ordinance since 1962.

However, despite this array of possibilities, the numbers of Green turtles nesting at Sham Wan (and indeed all of Hong Kong) are now so low that it is not uncommon that in some years none lay eggs, and indeed the species appears to be facing functional extinction (WWF-Hong Kong 2007).

When AFCD introduced protection measures at Sham Wan beach, the numbers of nesting Green turtles was already low. Prior to 1999, Lamma villagers were known to collect and eat turtles and their eggs. Globally it is estimated that about 200,000 to 300,000 marine turtles are accidentally killed by shrimp trawling nets and offshore longlines. Fisheries bycatch in waters around Hong Kong and Southern China could be one of the main reasons why Green turtles are disappearing, along with coastal developments around previously remote nesting beaches (WWF-Hong Kong 2007).

3.1.1. Inconsistencies Between The Conservation Status Of Different Species, And Their Protection Under The Law

Hong Kong's Wild Animals Protection Ordinance Cap 170 was drafted over 30 years ago. As has already been noted, under the Ordinance an animal is defined as *any form of animal life other than fish and marine invertebrates.* The lack of inclusion of fish and marine invertebrates in this and other Ordinances has proved to be one of the major weaknesses of WAPO.

Furthermore, a review of the Hansard discussion of the Ordinance at Hong Kong's Legislative Council in 1980 reveals that the list of protected species at Schedule 2 was only intended to protect those animals perceived as vulnerable to hunting. It was not intended to identify those species at conservation risk. The list has not been updated since 1996, and there are now nearly 500 species, including endemic freshwater fish, shrimps and dragonflies, which are not listed in Schedule 2 and are in need of legal protection (see Appendix 1).

Schedule 2 also provides protection to many common species which are not of conservation concern, such as the Tree sparrow (*Passer montanus*) and the Chinese bulbul (*Pycnonotus sinensis*) (Dudgeon and Corlett 2004) and some alien species such as the Red eared slider and the House Crow (*Corvus splendens*) which are not only thriving in Hong Kong (e.g. Lee & Choi 2005) but may be putting native species at risk. It also includes some species that are not believed to occur in Hong Kong including Reeve's Muntjac (P. Crow pers. comm.) and dugong.

The list in Schedule 2 is used as an official guide for planning and conservation. Environmental Impact Assessments, that are potentially important for the protection of significant wildlife habitats from development, routinely refer to the list in Schedule 2 to determine the importance of relevant species. However, the list is clearly out of date, was not based on scientific studies, and is inconsistent.

A piecemeal approach to the legislative amendment of Schedule 2 would be slow and cumbersome and as will be noted elsewhere in this report, there is also a legislative need to maintain lists of protected species of flora, and marine fish and invertebrates, respectively, under the Forest and Countryside Ordinance, and Fisheries Protection Ordinance. From a

practical perspective, and in order to be able to communicate more clearly this important conservation topic to society, there should be a unification of the different lists of protected species, greater clarity on the criteria used to identify species in need of protected species status, and the processes for adding or removing species from the protected species lists.

3.1.2. Recommendation 1: Compile A "List of Hong Kong Species Of Conservation Concern" And Use It To Update The List Of Wild Animals Protected Under Schedule 2 Of The WAPO

The list of protected animal species needs to be updated to:

- Include species of conservation concern that are not currently included
- Remove non-native species that may potentially be damaging to local biodiversity
- Remove common species and others of little conservation concern to allow for a greater focus on those that warrant greater conservation attention.

In order to accomplish this, and unify lists of protected species under different Ordinances, it is recommended that a "List of Hong Kong Species of Conservation Concern" (hereafter termed The List), based on the IUCN Red List criteria (but adapted to local circumstances) be established. The IUCN Red List of Threatened Species is internationally accepted as the most comprehensive, objective approach globally for assessing the conservation status of animal and plant species. The concept of The List is supported by Kadoorie Farm and Botanic Garden and WWF-Hong Kong. Initially, we recommend The List should follow the list created by Fellowes *et al.* (2002) as this was compiled by leading conservation experts with a considerable degree of rigor, but reference should also be made to useful discussions in Barretto *et al.*, 2011 p. 62-70 and Hopkinson, 2012 p. 18-19 on adapting the IUCN criteria to the scale of Hong Kong. Fellowes *et al*. (2002) identifies those terrestrial and freshwater species which, according to the best information available in 2002, deserve protection under Schedule 2; it is attached to this paper as Appendix 1. It is worth emphasising that none of the species in that list have – as of 2013 – been added to Schedule 2 of the WAPO.

Fellowes *et al*. (2002) will require updating, to include recently-discovered species of

conservation concern such as the Mai Po Bent-winged Firefly (*Pteroptyx maipo*). A similar assessment of conservation status needs to be carried out for marine species. Indeed, the recently-initiated process of creating a Biodiversity Strategy and Action Plan (BSAP) for Hong Kong (2013 – 2014) provides a timely opportunity to achieve this as it should include the development of a "Red List for Hong Kong" (Hopkinson 2012). We recommend that under the BSAP, an approved local 'Scientific Authority' or 'Secretariat' be set up with government and external expert representation, and tasked with the responsibility to manage local species status listings in the form of a published List of Hong Kong Species of Conservation Concern, and to define the criteria for the list.

Once established, The List should be routinely used to update lists of protected species under all relevant Ordinances, including the WAPO and The Forest and Countryside Ordinance (see Recommendation 7). The List can also provide reference for Environmental Impact Assessment studies (see Recommendation 14, 15) and the identification of SSSI's (Sites of Special Scientific Interest) and other areas zoned for conservation. The List would also help inform Town Planning Board decisions on developments with an impact on biodiversity.

The processes for adding or removing species from lists of protected species based on the List of Hong Kong Species of Conservation Concern should also be defined and made publicly available. We recognise that there may be certain circumstances whereby those species protected by law should be modified from those on The List, such as for ease of enforcement. For example, if there are two species that appear very similar, and one is common while the other is rare and of conservation concern, it may desirable to protect both, rather than risk harm to the rare species if it were to be mis-identified as the common species. Another example, in adopting the precautionary principle, would be to protect new species to science that are risk of harvesting by collectors, even if there is not enough information to determine their conservation status for The List.

3.1.3. The Exclusion Of Protection For Freshwater Fishes

As has already been noted as an issue, the WAPO defines an animal as *any form of animal life*

other than fish and marine invertebrates. There are certainly native freshwater fishes of conservation concern; Fellows *et al.* (2002) lists 25 species, and see Box 2. More recently in 2011, AFCD noted that 21 freshwater fish species were considered of conservation concern, and that four species appear extinct as they have not been recorded for 10 years or more. While AFCD suggested drafting species action plans to conserve these fishes, curiously there was no mention of providing protected-species status as a possible first step (AFCD 2011).

It should be noted that freshwater invertebrates can be protected under the WAPO, as they are not excluded from the definition of animal.

Box 2. Hong Kong Paradise Fish (*Macropodus hongkongensis*)

The Hong Kong paradise fish, which was only recognized as a distinct species in 2002, is only known to occur from a small number of lowland freshwater sites in Hong Kong and Guangdong. Many sites are vulnerable to development and the Sham Chung marsh with the largest known sub-population was bulldozed in the late 1990s (Chan *et al.* 2008). The species is collected locally for sale in aquarium shops, along with many other local species of freshwater fish, invertebrates, and the Hong Kong newt (Chan 2002).

Despite meeting the criteria to be included as Endangered on the IUCN Red List (Chan *et al.* 2006), and being clearly at risk from several major threats, the species still receives no legal protection in the Territory it was discovered and named after.

3.1.4. Recommendation 2: Include Freshwater Fishes Under WAPO, And Use A List Of Hong Kong Species Of Conservation Concern As The Basis For Including Freshwater Fish Species Of Conservation Concern Under Schedule 2

A number of amendments are necessary to WAPO to ensure that protected species can include freshwater fishes, but also to allow for the continuation of fishing for non-protected freshwater fishes (outside Country Parks) as follows:

- Add freshwater fish to the definition of *animal* at Section 2
- Provide a definition of *fishing* at Section 2 and also specify that *hunting* does not include *fishing*
- Amend Section 4 to prohibit *hunting* AND *fishing* of *protected wild animals*
- Freshwater fish species on The List can then be added to Schedule 2 in line with Recommendation 1

It may be necessary to provide a definition of "freshwater" so that it is clear which Ordinances will cover estuarine, brackish water and diadromous species.

3.1.5. Managing Invasive Alien Species

Many non-native species have established themselves locally, including at least 150 plant species, 20 birds, a few mammals, hundreds of terrestrial invertebrates and a number of freshwater fishes (Dudgeon and Corlett 2004). Invasive alien marine species have been far less studied but certainly occur. One of the largest is the Red Drum (*Sciaenops ocellatus*) which grows to 1.5 m in length and was introduced for local mariculture from the United States, but which has evidently escaped and appears to have established itself in local waters (Wilson 2001).

The invasion of alien species is a global conservation management problem that deserves legislative attention. Target 9 of the CBD Aichi Biological Targets requires that: *By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment*. Within Hong Kong, the established pool of alien species includes a number of invasive species that may need control or eradication e.g. see Box 3, but this is currently prevented by Cap 170 with the notable exception of Section 15 which allows for a special permit to be issued for the hunting of any species if the Director of AFCD sees fit to issue it.

Box 3. Common Snapping Turtle (*Chelydra serpentina*)

The Common snapping turtle is an invasive alien species from North America that probably entered Hong Kong through the pet trade. It has also invaded mainland China, Taiwan and Japan (van Dijk 2012). This species is a voracious predator that eats insects, fish, clams, crayfish, snails, worms, frogs, tadpoles, snakes, turtles, birds, small mammals, and aquatic plants (Minnesota Department of Natural Resources 2013). As the Common snapping turtle is now present in some local reservoirs, it is may be negatively impacting local biodiversity but to an unknown degree (KFBG pers. comm. 2013).

All Chelonian (turtles, terrapins, tortoises etc.) species occurring in the wild are protected under Schedule 2, but the Common snapping turtle is an invasive alien species and should not receive protection.

In order to gain insight into an appropriate legislative response to the threat of invasive alien species, some examples of overseas legislation were reviewed, as set out below.

3.1.6. Overseas Legislation For Managing Impacts From Invasive Alien Species

Invasive alien species have been recognized as a global threat to biodiversity more recently than say, hunting or pollution. In some cases the legislative response has been to simply add provisions to relevant legislation. For example Canada has legislation to address invasive alien species in 14 different Acts. This review has instead chosen to focus on two nations that have faced major threats to their rich endemic wildlife, and invested substantial resources to combating those threats: Australia and New Zealand. Both countries have consolidated their legislative response to invasive alien species within a single Act. How legislation in the two countries both protects native wildlife, and allows for actions to be taken to control or eradicate invasive alien species (but not how measures are taken at borders to prevent the entry of alien species), was examined.

Australia

The Environment Protection and Biodiversity Conservation Act 1999 (the EPBC Act) is the Australian Government's central piece of environmental legislation. It provides a legal framework to protect and manage, nationally and internationally, important flora, fauna, ecological communities and heritage places — defined in the EPBC Act as matters of national

environmental significance.

Under the EPBC Act, the Commonwealth can, among other things:

- list key threatening processes. These processes threaten the survival, abundance or evolutionary development of a native species or ecological community. Examples of invasive species listed as key threatening processes are rabbits, foxes, cats, pigs, unmanaged goats, rodents on islands, red imported fire ants, *Phytophthora cinnamomi*, chytrid fungus
- develop and implement threat abatement plans. These plans outline the research, management and other actions necessary to reduce the impacts of a listed key threatening process on affected listed threatened species and ecological communities
- make or adopt and implement recovery plans.

A process can be listed as a key threatening process if it could:

- cause a native species or ecological community to become eligible for inclusion in a threatened list (other than the conservation dependent category); or
- cause an already listed threatened species or threatened ecological community to become more endangered; or
- adversely affect two or more listed threatened species or threatened ecological communities.

A threatening process is defined as a key threatening process if it threatens or may threaten the survival, abundance or evolutionary development of a native species or ecological community. For example, invasive species listed as key threatening processes are predation by the European red fox, feral rabbits or unmanaged goats. The assessment of a threatening process as a key threatening process is the first step to addressing the impact of a particular threat under Commonwealth law.

Threat abatement plans provide for the research, management, and any other actions necessary to reduce the impact of a listed key threatening process on native species and ecological communities. Implementing the plan should assist the long-term survival in the wild of affected native species or ecological communities.

New Zealand

Invasive alien species are managed in New Zealand under the Biosecurity Law Reform Act 2012. It provides a legal basis for excluding, eradicating and effectively managing pests and unwanted organisms, and its powers can be used by government agencies, regional councils and pest management agencies. It is an enabling tool that provides a range of functions, powers and options for the management of risk organisms.

Part 5 of the Act allows for the eradication or effective management of harmful organisms that are present in New Zealand by providing for:

- the development of effective and efficient instruments and measures that prevent, reduce, or eliminate the adverse effects of harmful organisms on economic wellbeing, the environment, human health, enjoyment of the natural environment, and the relationship between Māori, their culture, their traditions and their ancestral lands, waters, sites, wāhi tapu, and taonga; and
- the appropriate distribution of costs associated with the instruments and measures.

An "unwanted organism" is defined in the Biosecurity Act 1993 as any organism a chief technical officer believes capable of causing unwanted harm to any natural and physical resources or human health. Several departments have such chief technical officers. It also includes any new organism the Environmental Risk Management Authority (ERMA) has declined approval to import, or any organism specified in the Second Schedule of the Hazardous Substances and New Organisms Act 1996.

Unwanted organisms include “notifiable” organisms which are generally limited to those organisms which cause, or have the potential to cause, serious harm to natural and physical resources or human health.

To be made a notifiable organism, an organism needs to:

- have been determined as a notifiable organism by a chief technical officer; and
- have been declared as a notifiable organism by Order in Council.

A Register is kept of all unwanted and notifiable organisms.

Management options under the Biosecurity Act are:

- import and border controls aimed at effective management of risks associated with the importation of risk goods, including treatment of contaminated goods and craft;
- access to Part VI powers for organisms declared unwanted organisms;
- exigency actions where other options are not adequate or available;
- national pest management strategies that provide access to powers and rules by any organisation that is declared a pest management agency. Any response must be undertaken within those powers or rules, unless the strategy is subsequently amended or revoked in accordance with the Biosecurity Act;
- regional pest management strategies (mainly administered by regional councils);
- access by regional councils to powers in the Biosecurity Act for small-scale management programmes without needing to have a pest management strategy; and
- enforcement of prohibitions which make it an offence to sell, propagate, breed, release or display an unwanted organism or pest.

Appropriate legislation to control the import/release of alien and potentially invasive species into the wild (either intentionally or accidentally) should be introduced into Hong Kong, and will be required as part of Hong Kong's commitment to implementing the CBD.

3.1.7. Recommendation 3: Remove The Protection Afforded To Invasive Alien Species Under WAPO Schedule 2 (And Potentially Other Ordinances)

Section 15 of the Ordinance does allow special permits to be issued to allow the hunting of any animal, including protected species, and indeed the Agriculture, Fisheries and Conservation Department (AFCD) uses this to facilitate the trapping and occasional killing of nuisance Eurasian Wild pig (*Sus scrofa*), and presumably the culling programme for House Crows (*Corvus splendens*) (e.g Lee and Chow 2007). However, we do not believe this is a satisfactory arrangement as for example i) there is no transparency on how decisions to select species for pest management are made; ii) lists of such species are not made public; and. iii) there is a

distinct lack of clarity as to the degree to which invasive alien species that are classified as protected species can or should be controlled.

In learning from the legislative responses of Australia and New Zealand to invasive alien species, we recommend that the WAPO be amended to allow for the process of identifying terrestrial and freshwater "unwanted organisms" (defined as invasive alien species which cause, or have the potential to cause, significant harm to natural and physical resources or human health), and for the creation of a public list of such unwanted organisms. The criteria and procedure by which an invasive alien species would be identified as an unwanted organism would also need to be defined. Logically, those unwanted organisms listed under WAPO will be animals, while unwanted plants would be listed under the Forest and Countryside Ordinance (Recommendation 10).

Furthermore, as the intention should be that only government agencies and approved experts (including contractors) be authorized to act to manage unwanted organisms using approved methods, and under a species specific management plan, the procedures for defining and regulating such courses of action should be defined.

Lastly, in order to ensure that management strategies tackling unwanted organisms can include private land, changes are suggested to the relevant Ordinances (see Recommendation 10).

3.1.8. Recommendation 4. Prevention Of New Public Actions Against Non-Protected Species Through Potential Loopholes In The Definition Of "Hunting"

In order to facilitate the public to act against pests such as cockroaches and rodents, the WAPO specifically allows certain tools such as small traps and poisons. This raises the possibility that the public might use such pest management tools to target native but relatively common species such as the Tree sparrow if they are removed from the Schedule 2 list of protected species, as per Recommendation 1 (above). The targeting of wild species that were previously protected, by the public, is certainly not desirable, and the WAPO will need amending to ensure this is not permissible.

3.1.9. Recommendation 5: Rename Pest Control Tools From "Hunting Appliances" To "Approved Pest Management Appliances"

The Wild Animals Protection Ordinance was originally aimed at curbing the illegal hunting and trapping of wildlife in Hong Kong, which was a major problem in the late 1970's. As such, it protects all wild animals in Hong Kong (with the notable exception of fish and marine/freshwater invertebrates) from hunting, unless carried out with an AFCD approved hunting appliance. Approved hunting appliances are listed in the regulations at Cap 170A. Clearly these appliances (pest poisons, insecticides and pesticides and spring-back or cage type rat and mice traps) are not intended for traditional hunting but as aids to manage pests. Conversely and specifically, hunting or trapping appliances (defined as live decoys, pitfalls, arms, nets, gins, snares, poison or poisoned weapons, bird limes, traps or bright lights) may not be used to hunt wild animals,

Within the further confines of a country park, it is an offence under the Country Parks and Special Areas Regulations Cap 208A to even possess a hunting or trapping appliance unless a special permit has been issued by the AFCD. It is an offence to both carry or discharge such items without a permit.

It is a misnomer to call pest control aids "hunting appliances". There is concern within the KFBG and WWF that the use of the term "hunting" has encouraged the public to believe hunting of wild animals is permitted in Hong Kong. We recommend the list of approved hunting appliances should be re-titled as "approved pest management appliances".

3.1.10. Recommendation 6: Enhance Controls For The Possession Of Protected Wild Animals, To Reduce The Opportunity For Laundering Locally Caught Wildlife Into The Legal Trade

Whilst it is an offence to possess a protected wild animal, the law provides a defence where the possessor can provide documentary evidence that the animal was not taken in Hong Kong; for

instance, the provision of an import permit for that species or documentary proof of purchase outside Hong Kong. Conservationists note that there is anecdotal evidence to suggest that laundering of locally caught wildlife into the legal trade does occur, although may be difficult to readily prove. For certain species, notably critically-endangered Golden-coin turtles (*Cuora trifasciata*), the "leakage" of wild caught animals into the legal trade may be increasing the possibility of the species becoming extinct in the wild (G. Ades, pers. comm.).

We recommend that a permit system and individual identification system be introduced for entry and possession of any WAPO Schedule 2 protected wild animal into Hong Kong that would reduce the opportunity for illegal trade in protected species by helping to verify that the animal was sourced outside of Hong Kong. An individual animal identification system will need to be developed. For reference, options presently acceptable for identifying live CITES Annex A species for trade within the European Union include a uniquely marked close ring for birds, and unalterable microchips for other animals, or where this is not possible due to the physical or behavioural characteristics of the specimen concerned, a ring, band, tag, tattoo or other appropriate method (Department of Environment, Food and Rural Affairs 2011).

3.2. The Forests and Countryside Ordinance Cap 96

The purpose of this Ordinance is to *consolidate and amend the law relating to forests and plants, and to provide for the protection of the countryside*. Section 21 of the Ordinance provides general protection to all living plants in plantations and forests on government land. The Ordinance was first enacted in 1937.

3.2.1. The List Of Protected Plant Species Needs Updating

The Forestry Regulations of the Forests and Countryside Ordinance (FCO) contain a list of protected plant species, including all native tree-ferns, camellias, orchids, rhododendrons and a number of other species. Possession of any portion of plants on the list is an offence, and the regulation has proved very useful. However, the list was primarily created to protect those species of value to collectors, rather than those that may be threatened by development or habitat loss, and also contains many common species, while omitting rarities (Dudgeon and

Corlett 2004).

3.2.2. Recommendation 7: Compile A List of Hong Kong Species of Conservation Concern And Use It To Update The List Of Wild Plants Protected Under The FCO

The list of protected plant species needs to be updated to include species of conservation concern that are not currently included.

In order to accomplish this, and to unify lists of protected species under different Ordinances, it is recommended that the plant species of conservation concern be updated through The List proposed in Recommendation 1, which in turn can be used to routinely update lists of protected plant species under the Forestry Regulations of the Forests and Countryside Ordinance. The List can then also serve to inform EIA studies (see Recommendation 14) and the identification of SSSI's (Sites of Special Scientific Interest) and other areas zoned for conservation, with regards to plants.

3.2.3. Protected Plants Should Be Conserved On Private Land

The effectiveness of section 21 of the FCO is undermined by the restrictive definition of forest and plantation contained in section 2. Only plants on government land are protected and as such, a private land owner can cut and clear any plant species with impunity, even those of conservation value. We recommend that private owners should not be permitted to cut or otherwise damage those rare plant species listed at Regulation 2 of the Forestry Regulations (as updated). Given that the list of plants in Regulation 2 includes species of high conservation value, and that protected animals under the WAPO cannot be harmed simply because they are found on private land, the exception afforded to private land owners should be removed.

The ongoing deliberate destruction of vegetation to degrade land (essentially site formation and drainage works) and make it easier to apply for development permission, and illegal removal of Incense trees (*Aquilaria sinensis*) highlight in different ways, the need for additional legislative protection for rare plant species.

3.2.4. Recommendation 8: Provide Protection For Rare Plant Species Found On Private Land Under The FCO

The legal protection of plants currently extends only to those found in forests and plantations on government land. Rare plant species should receive legal protection wherever they occur. With the recognition of international conservation principles, there is no longer any reason to limit the application of conservation protection measures to government land. Further, extending protection of rare plants to private land will create consistency with the treatment of animals under the WAPO (i.e. they cannot be hunted on private land).

3.2.5. Recommendation 9: Amend The FCO To Restrict The Possession Of Tools That Might Be Used To Damage Protected Plants

We recommend that the Ordinance be amended to prohibit the possession of choppers, saws and pick axes, without a permit, in forests, plantations and elsewhere in the countryside (similar to the ban on possession of traps and hunting devices in country parks under WAPO). If individuals cannot legitimately carry such items, it will make it more difficult for them to remove or damage protected plant species. Obviously such a restriction could not be enforced on private land (or land zoned for agriculture) but would not be required if Recommendation 8 is adopted.

3.2.6. Recommendation 10: Amend The FCO To Allow The Authorities To Be Able To Control Alien Plant Species On Private Land

Invasive alien plants can currently be managed on government land through the issue of special permits under Section 23. As invasive alien plants can spread from private to government land, we recommend that authorities should have the power to enter private land and tackle invasive alien plant species so as to be able to provide comprehensive management of unwanted organisms. We note that private lands within Country Parks are still governed by Country Park regulations.

The Forest and Countryside Ordinance should be amended to allow for the process of identifying unwanted (plant) organisms, and a public list of such unwanted organisms should be created in line with Recommendation 3.

3.3. The Fisheries Protection Ordinance Cap 171

The Fisheries Protection Ordinance (FPO) was intended *to promote the conservation of fish and other forms of aquatic life within the waters of Hong Kong and to regulate fishing practices and to prevent activities detrimental to the fishing industry* whereby "fish" is defined as all forms of aquatic life and turtles. The FPO was first enacted in 1962.

Under Section 4 of the Ordinance, regulations can be enacted for:

(a) the prohibition or restriction of the use of explosives for the purpose of fishing;

(b) the prohibition or restriction of the use of toxic substances for the purpose of fishing;

(c) the prohibition or restriction of the taking of any variety of fish, or fish of any size, from the waters of Hong Kong;

(d) the prohibition or restriction of the use of any specified kinds of net or of nets having a mesh of any specified size for the purpose of fishing;

(e) the conservation of oysters and oyster beds;

(f) the prohibition or restriction of the collection, removal or destruction of any variety of fish spawn or turtle eggs;

(g) the protection of spawning areas;

(ga) the prohibition or restriction of the use of any apparatus of a class or description specified under paragraph (gb), for the purpose of fishing;

(gb) the specification by the Director, by notice published in the Gazette, of the class or description of apparatus for the purposes of paragraph (ga);

(h) generally, the protection or regulation of fishing.

These regulations facilitate quite wide-ranging management measures that potentially could have been used to control the marine capture fishery so that its impacts on populations of marine species and biodiversity were minimized. However, the only regulations that were enacted were those relating to the prohibition of explosives and toxic substances, destructive fishing such as electric fishing, and the use of dredging and suction devices (and in 2012, trawling). These seem to have been fairly successful. For example, in the mid-1990s explosives were still occasionally being used in remote areas every year and arrests made (Cornish & McKellar 1998), but very few cases seem to have been reported more recently.

3.3.1. Fishing Has Had A Major Impact On The Abundance Of Different Species Of Marine Fish And Invertebrates

Regulations to prohibit or restrict the taking of any species, or otherwise regulate the amount of fishing were never enacted, with major consequences. A dramatic increase in fishing effort caused a decline in fish catches per unit of effort starting in the 1960's, along with major changes in ecosystem structure as larger species became rarer (see Box 4 for an example), and small fishes and benthic invertebrates became more abundant (Cheung and Sadovy 2004).

Box 4. Chinese Bahaba (*Bahaba taipingensis)*

The Chinese bahaba is one of the largest species of croakers, a family of marine fishes, and grows up to 2 m in length. The species has a small global distribution, occurring only within China from the Yangtze River southwards to Hong Kong. It aggregates to spawn in the mouths of major estuaries including the Pearl River Estuary, making it vulnerable to fishers who specifically target it.

The swimbladder of this species is highly prized for its medicinal properties and can be worth > US$ 50,000 per kg dried. As a result, the Chinese bahaba has been heavily targeted and the numbers and size of fish caught has dropped dramatically since peak catches in the 1930s to 1950s. The species is classified by the IUCN as Critically Endangered globally (Ng & Cheung, 2006), and has been listed as a Grade II State Protected Species in the Peoples Republic of China since 1989. Thus it is protected, and its exploitation is limited and regulated by Chinese authorities under Chinese legislation.

In Hong Kong, there are no restrictions on catching Chinese bahaba by recreational or licensed commercial fishers. As the species appears to be close to extinction, and as it is protected in the rest of its range in Mainland China, compatible legislation for conserving the Chinese bahaba should be enacted in Hong Kong.

The sustainability of fisheries and maintenance of marine biodiversity should markedly improve following the 2012 amendments to the FPO which banned trawling in Hong Kong waters from the 31 December 2012. All local owners of non-trawling fishing vessels have been permitted, under the new licensing scheme, to register their boats and continue fishing. While the numbers of non-trawling fishing vessels will not be allowed to expand, these moves alone cannot guarantee the development of sustainable fisheries as a licensing system can only control fishing effectively if it is pursued in accordance with resource availability, and appropriate limits set on fishing effort.

However, there has not yet been a study to quantify the harvesting capacity of the remaining fleet, and to determine whether this will prevent, or allow a recovery of fish stocks and the ecosystem. In addition, under the ecosystem based management approach (such as that promulgated for example, by the Marine Stewardship Council), the fishery should also ensure that it does not adversely impact populations of species that are unintentionally caught, especially rare and endangered species, in order to be considered sustainable.

Thus far, the restrictive amendments to the FPO have specifically exempted recreational fishing from non-fishing vessels involving hand lining and other so called non-damaging fishing methods. However, as recreational fishing has been growing in Hong Kong and targets many of the same species, legislation will also be needed to manage recreational fishing, including spearfishing.

The 2012 amendment to the Fisheries Protection Ordinance also provides for the designation of Fisheries Protection Areas (FPAs) in Hong Kong waters to protect spawning and nursery grounds of susceptible marine fish. These may provide an additional and useful fisheries tool in the future to building sustainable fisheries, but discussions on how to optimally designate FPAs have not yet been initiated.

Box 5. Whale shark (*Rhincodon typus)*

Whale Sharks are found in all tropical and warm temperate seas except the Mediterranean.

The Whale shark is the largest living shark species, growing to around 20 m in length. They are filter feeders and harmless to humans. The major threats to Whale sharks are from fishing - small-scale harpoon and entanglement net fisheries have taken place in various regions of the world including Taiwan, and the Philippines. Whale sharks are listed as Vulnerable on the IUCN Red List (Norman 2005).

Whale Sharks are legally protected in Australian Commonwealth waters and the states of Queensland, Tasmania and Western Australia, the Maldives, Philippines, India, Thailand, Malaysia, Honduras, Mexico, and US Atlantic waters. Full legal protection is under consideration in South Africa and Taiwan (POC) has recently introduced an annual quota for its fishery. In 1999 the Whale shark was listed on Appendix II of the Bonn Convention for the Conservation of Migratory Species of Wild Animals (CMS). The Whale Shark was added to Appendix II of the Convention on International Trade in Endangered Species (CITES) in 2003.

Whale shark sightings have regularly been reported in the summer months offshore from Hong Kong by divers, but only rarely seem to venture into Hong Kong waters. However, one was caught in 2008 in southern waters and subsequently died while the fisher apparently tried to negotiate its sale, and another was photographed off Lamma Island in 2012.

Live Whale sharks receive no protection in Hong Kong waters (partly as neither China nor Hong Kong are parties to CMS, nor the separate CMS MoU on sharks), although any imported Whale shark fins or other parts require a CITES import permit. While anybody catching and retaining a Whale shark in local waters technically has to follow CITES regulations regarding possession, there is a clear and pressing case for ensuring this species of global conservation concern receives local legislative protection alongside other vulnerable species.

3.3.2. Some Marine Species Of Fish And Invertebrates Will Need Special Protection From Fishing

The examples of the Chinese bahaba and Whale shark (Boxes 4 and 5, respectively), along with many commercially-important fishes that have been overexploited such as the Hong Kong grouper (*Epinephelus akaara*, Cornish 2003a) illustrate that some fish species will need to be excluded from being fished, if they are to be effectively conserved. As has been noted before, the WAPO does include some marine species (whales, dolphins, and marine turtles) under Schedule 2 of protected species, yet specifically excludes marine fish and invertebrates, opening the possibility of expanding the definition of "animals" to include marine fish and invertebrates as a way of moving such species of conservation concern onto lists of protected species. However, the WAPO was not designed, and is not well-equipped, to protect species of conservation concern within groups of species that it is otherwise legally (and societally

acceptable) to harvest from the wild, and as such we do not recommend this option.

As has already been noted, the FPO does however, allow for regulations to be made to conserve species (and their spawn/eggs) amongst those that might be legally fished, but as such regulations have not yet been enacted, it is unclear how this might best function from a practical and conservation perspective. Therefore, reference has been made to examples from two progressive countries overseas with strong nature conservation policies, and large expanses of marine waters that are fished.

3.3.3. Overseas Legislation for Managing Impacts from Fishing on Protected Species

Australia

The Environment Protection and Biodiversity Conservation Act 1999 (EPBC Act) establishes four different categories of protected species in Commonwealth areas**.** These provide for the recovery of populations and/or the long-term conservation of a species. The following four categories are collectively defined as protected species.

1. ***Threatened species*** generally include species with low population numbers, those that have had a reduction in habitat or distribution, or are subject to an increase in other threats to the species survival.

2. ***Migratory species*** are listed to meet Australia's obligations under certain International treaties (such as the Convention on Migratory Species) i.e. provide protection for species listed in the Convention.

3. ***Marine species*** are listed to provide general protection to Australia's marine native wildlife to reduce the likelihood of population decline.

4. ***All Cetaceans*** are protected.

Examples of marine animal species that are classified as protected and which occur in the waters of Commonwealth fisheries include whales, dolphin, seabirds, sea snakes, turtles, seals and sea lions, dugongs, crocodiles, sea horses, and a small number of shark and other fish

species.

Although it is an offence under the EPBC Act to “interact” with protected species, all Commonwealth fisheries have been assessed and accredited under the Act on the basis that the management plan or regime includes all reasonable steps to ensure that members of protected species are not adversely affected by the fishing operation. This means that as long as operators are fishing in accordance with the fishery management arrangements it is not an offence to interact with a protected species. It is, however, an offence not to report these interactions (to the Australian Fisheries Management Authority or the Department of the Environment, Water, Heritage and the Arts).

An "interaction" means any physical contact an individual (person, boat or gear) has with a protected species that causes death, injury or stress to the animal directly resulting from fishing activities. This includes any collisions, catching, hooking, netting, entangling, or trapping of a protected species.

New Zealand

The Ministry of Fisheries has the responsibility under the Fisheries Act 1996 (Sections 8, 9, and 15) to avoid, remedy and mitigate any adverse effects of fishing on the aquatic environment, including protected species. In addition, provisions of the Marine Mammals Protection Act 1978 and the Wildlife Act 1953 require those who accidentally or incidentally kill or injure marine mammals or protected wildlife to report to a conservation or fishery officer. This includes both commercial and non-commercial fishing activities.

New Zealand’s Department of Conservation (DOC) has developed a process of classifying the threats to species; this process has been applied to all New Zealand’s species groups, including marine species. Lists are maintained of New Zealand’s seabirds and marine mammals and their IUCN and DOC threat classifications.

Protected species include almost all New Zealand seabirds, all marine mammals, some marine reptiles, black and some red corals, and a few fish including the Great white shark (*Carcharodon carcharias*). Fishing has the potential to affect all of these groups through direct

incidental capture or damage, habitat modification, competition effects, or other indirect effects.

It is not illegal to accidentally catch protected species providing they are immediately released alive and unharmed. Catches of protected species need to be reported to the DOC and/or Ministry of Fisheries as soon as possible. No part of the animal may be retained, but DOC may request dead specimens be landed for scientific research.

As can be seen, Australia and New Zealand have devised similar practical approaches to protecting specific marine species within areas that are fished. Fortunately, it would be relatively straightforward to adopt a similar approach in Hong Kong by modifying existing legislation. The example of the Chinese bahaba (Box 4) also demonstrates that species that form spawning aggregations may be particularly vulnerable to fishing, and at such times the aggregation may need to be protected from fishing.

3.3.4. Recommendation 11. Enact FPO Regulations To Protect Specified Marine Fish And Invertebrates (Including Spawn/Eggs), Based On A List Of Hong Kong Species Of Conservation Concern

In accordance with Recommendation 1, it is recommended that The List be established and to include marine fish and invertebrates. While the criteria for determining marine species of conservation concern may be different from that of terrestrial species, the intention is that one list be compiled with all terrestrial, marine and freshwater animals and plants of conservation concern.

Furthermore, we recommend that under Section 4 of the Fisheries Protection Ordinance, regulations be enacted for:

- the prohibition or restriction of the taking of any variety of fish, or fish of any size, from the waters of Hong Kong
- the prohibition or restriction of the collection, removal or destruction of any variety of fish spawn or turtle eggs

- the protection of spawning areas.

Those species of marine fishes and invertebrates on The List, should be then protected under the new FPO regulations, and classified as protected species (although there may be compelling reasons why the marine species protected under the FPO might not be identical to those on The List, see Recommendation 1).

As is the case for Recommendation 1, we suggest that once established, The List should be routinely used to update lists of protected species under all relevant Ordinances, including the Fisheries Protection Ordinance and provide reference for EIA studies and the identification of SSSI's (Sites of Special Scientific Interest), Marine Parks, Marine Reserves and Fisheries Protection Areas.

3.3.5. Recommendation 12. Amend The FPO To Allow For Accidental Interactions With Protected Marine Species

In order to deal with marine protected species that may be accidentally caught with legal fishing methods, the legislation from Australia and New Zealand provides a useful reference point (particularly as the approach is very similar between the two countries).

We recommend that the FPO be amended so that it is not illegal to accidentally interact with protected species (including collisions, catching, hooking, netting, entangling, or trapping) providing:

- Animals that are alive and unharmed are immediately released
- Catches of protected species that are injured or dead are reported to the AFCD as soon as possible
- AFCD may request dead specimens be passed to them for scientific research, or discarded
- No part of the animal may be retained

We do not recommend that allowances be made for "accidental" spearfishing. Visual

identification of the target should be a critical part of this activity.

3.4. Marine Parks Ordinance Cap 476

As previously stated, the legal protection accorded to marine fish and other marine and coastal species is unsatisfactory. The Marine Parks and Marine Reserves Regulations Cap 476A, enacted in 1995, provides some additional although rather piecemeal protection to marine animals (and habitats) within Hong Kong's four designated parks. Mobile animals only enjoy protection when within the geographic limits area of the parks, where they cannot be fished, hunted or removed, except by permit holders (which currently includes several hundred small-scale commercial fishing vessels). Disturbing the eggs, juvenile or the nesting sites of any protected marine species is also prohibited, although in practice only provides additional protection for a small number of species (i.e. turtles) in Schedule 2 to the Ordinance.

The Schedule 2. Protected Marine and Coastal Species are:

1. Dolphins, whales and porpoises
2. Bats
3. Wild birds
4. Sea turtles terrapins, tortoises
5. Stony corals, true corals and black corals
6. Marine grasses
7. Sea horses
8. Horseshoe crabs

3.4.1. Other Species Additional To Those In Schedule 2 Should Be Protected In Marine Parks

In keeping with our previous recommendations, the Schedule 2 Protected Marine and Coastal Species List should also include those marine fish and invertebrates protected under the Fisheries Protection Ordinance. While the Chief Executive of Hong Kong pledged to ban commercial fishing in all marine parks in the policy address of 2008, this has yet to occur, and

it is possible that fishing by indigenous villagers may continue (under permit) for the foreseeable future.

3.4.2. Recommendation 13. Amend Schedule 2 Of The MPO To Include Protection Of Certain Marine Fish And Invertebrates.

In order to enhance the consistency of the marine species protected throughout Hong Kong waters (by being consistent with the FPO for any new species identified under The List), an addition should be made to the MPO Schedule 2 list of Protected Marine and Coastal Species as follows "9. Other species of marine fish and invertebrates listed as protected species under Section 4 of the Fisheries Protection Ordinance" i.e. following Recommendation 9.

We note that section 43 of the Fisheries Protection Ordinance stipulates that where the FPO is inconsistent with the Marine Parks Ordinance, the latter shall prevail.

3.5. Country Parks Ordinance Cap 208

The purpose of this Ordinance is to *provide for the designation, control and management of country parks and special areas, the establishment of the Country and Marine Parks Board, and related purposes.* It was enacted in 1976.

The Ordinance provides the legislative tools to protect large swathes of an impressive portion of our natural environment, although the country parks mostly cover upland habitats, and conversely, have a low coverage of lowland freshwater systems. One conservationist interviewed for this study commented that compared to the Country Parks Ordinance, all other statutory countryside protection mechanisms in Hong Kong are weak in terms of long term protection of habitats and species.

While enforcement is thought generally to be good in country parks, those interviewed for this study noted that there is room for improvement and that, for example, children with fishing nets in country parks, and members of the public with herbs and medicinal plants that have apparently been collected within country parks can occasionally be seen. Furthermore, the

trapping and collecting of species of high commercial value, e.g. the Golden coin turtle and Incense trees, is still believed to be widespread even inside country parks. In order to address enforcement issues, we suggest that a practical approach to increasing enforcement (see 3.7), rather than legislative amendments is appropriate.

Regulation 6 of the Country Parks and Special Areas Regulations allows for permits to be issued for persons to use hunting a trapping appliances within country parks, while Regulation 8 allows for permits to cut, pick and uproot plants. These should be sufficient to allow for the control of invasive alien species within country parks as part of species-specific management plan defined under the WAPO or FCO (see Recommendation 2).

3.6. Environmental Impact Assessment Ordinance Cap 499

Environmental impact assessments are one of the most important tools to reduce the impacts of development on biodiversity. However, there are some shortcomings with regards to how EIAs evaluate impacts to species that will be highlighted below.

3.6.1. Lack Of Clarity In Assessing The Ecological Importance Of Different Species

Under the Environmental Impact Assessment Ordinance (EIAO), assessing the impacts of development to wildlife species is defined under the Technical Memorandum Annex 8 as follows:

"Annex 8: Criteria for evaluating ecological impact

Ecological impact refers to the effect on a habitat or species due to direct or indirect changes in the environment brought about by a project. Besides magnitude and scale, the significance of an ecological impact is also related to the asserted importance of the habitat or species to be affected. In general, the impact on an important habitat or species will be more significant in comparison to other less important ones.

The following are some general criteria that can be used for evaluation of the significance of an ecological impact and the ecological importance of a site/habitat or a species. These criteria are not exhaustive and may carry different weight in different cases."

Table (3) Evaluating species found within a site / habitat

Criteria	**Remarks**
Protection status	Species listed under local legislation and international conventions for conservation of wildlife shall be given special attention. References shall also be made to those protected by law in China, especially Guangdong Province.
Distribution	Species with restricted distribution (locally or regionally) will be rated higher than those more widespread ones. More weight shall be given to species which are endemic to Hong Kong or South China.
Rarity	Normally the rarer the species, the more value it has. However care shall be taken in assessing exotic weeds, escaped cultivars or captive species, vagrants and introduced species which have lower value. Greater weight shall be given to those which are internationally rare, than to regionally rare (within South China) and finally locally (within Hong Kong) rare species. Reference could be made to Red Data Books and species lists of international conventions for conservation of wildlife.

As can be seen, Table 3 of the Technical Memorandum acknowledges that there may be species of conservation importance that do not appear in lists under local legislation, but then only provides an indication of how to assess the significance of impacts to such species, which is liable to lead to subjective interpretations. While it is positive that the EIAO, as currently written, does not specifically exclude any groups of species from consideration (as with the

WAPO for instance), there may be some knock-on effects as, for example, EIAs have only occasionally given greater weightings to species of commercially valuable marine fishes that are identified with the criteria in Table 3 as deserving greater attention (A. Cornish, pers. obs), and instead normally treat them as a homogenous group. This is probably also as the conservation status of only a few non-protected local marine species have been defined, and there is no marine equivalent of the Fellowes *et al.* (2002) list which can readily be referred too.

3.6.2. An Overly Narrow Definition Of Marine Species Of Importance To Fisheries

Annex 9. Criteria for evaluating fisheries impact (under the EIAO)

Annex 9 consists of a table containing "some general criteria that can be used for evaluation of fisheries impact of a proposed development." The only general criterion that refers to evaluating species level impacts to fisheries from development is as follows:

Criteria	**Conditions under which the fisheries impacts of a proposed development would be rated higher**
Destruction and disturbance of nursery and spawning grounds	Nursery and spawning grounds of commercially important species are disturbed or destroyed, affecting the recruitment of juveniles and hence the adult population in future

This criterion, which refers only to commercially-important species, omits other types of species whose depletion could have significant impacts to fisheries, such as through impacts to ecosystem structure, and therefore, fisheries. Such impacts have been poorly studied in Hong Kong, but it is believed, for example, that overfishing of the once common Black-spot tuskfish (*Choerodon schoenleinii*), a notable predator of *Diadema* sea urchins is at least partly responsible for the huge numbers of these sea urchins found on local reefs, and urchin feeding activity may in turn be inhibiting the growth of corals and other sessile benthic organisms (Cornish 2003b).

3.6.3. Recommendation 14: Amend The EIAO Technical Memorandum Annex 8 To Refer Specifically To A List of Hong Kong Species Of Conservation Concern

Formulation of The List formed the basis for Recommendation 1. Table 3 of the EIAO TM should be amended to indicate that species of conservation concern on The List should be given a higher weighting when determining the significance of impacts to native species. Referring directly to The List, rather than lists of protected species under the Wild Animal Protection, Forests and Countryside, and Fisheries Protection Ordinances, means that EIAs can take advantage of updates to The List immediately, without waiting for the lists of protected species to be updated by law, which may take months.

3.6.4. Recommendation 15: Amend The EIAO Technical Memorandum Annex 9 To Include Ecologically Important Marine Species On The List of Hong Kong Species of Conservation Concern

Species of conservation concern on The List that are also of particular importance to the maintenance of ecosystem integrity should be highlighted as significant when considering the impacts of development on fisheries, through an amendment to Annex 9 of the Technical Memorandum.

3.7. Consider Establishing Additional Bodies To Assist With Enforcement

Finally, it is the view of some in the conservation community that authorities are currently insufficiently equipped to deal with the targeting by criminals of high-value species such as Incense trees and Golden-coin turtles. Chinese Pangolins (*Manis pentadactyla*) may also be at risk. As such, we encourage the parties involved in the formulation of Hong Kong's BASP to consider recommending that a Wildlife Crimes Unit should be set up to handle crimes involving conservation issues. This has been done successfully overseas (e.g. the United Kingdom), and specialist enforcement with appropriate investigation skills should improve enforcement of the law, and provide further protection to Hong Kong's biodiversity.

A programme whereby members of the public are appointed as volunteer Nature Wardens by

the Agriculture and Fisheries Department could also be revived to provide an additional watchdog function, particularly outside office hours (i.e. when government enforcement efforts are reduced). This role could include providing timely information or evidence of illegal wildlife activity, and could contribute to rising awareness of conservation issues among the general public. Such a programme is permitted under section 16 of WAPO, which states that The Chief Executive may appoint any person to be a nature warden or honorary nature warden.

4. CONCLUSION

The legislation reviewed here provides the backbone of the HKSAR Government's efforts to conserve biodiversity. The effectiveness of any legislation to protect biodiversity is dependent on appropriateness of the legislation itself (the Ordinances and regulations enacted) to reduce the impacts of threats, on the effectiveness of enforcement (in the field, and the willingness of courts to prosecute offenders to the maximum extent permitted), and supporting policies. Taken as a whole, those Ordinances focused on protecting terrestrial species have played a major role in reducing the extent and impacts of hunting and collecting on biodiversity over the years. Furthermore, the country parks (and special areas) cover nearly 40% of the land area, and with the exception of the poaching of a few high-value species, largely provide effective protection for the species that inhabit them. By comparison, the impact of those Ordinances aimed at conserving marine biodiversity are a work in progress. The marine parks and reserve cover less than 3% of the sea area and commercial fishing by permit holders is still permitted in the marine parks, while the FPO was woefully underutilized (in terms of meaningful regulations that were not enacted), until very recently.

The CBD encourages an ecosystem approach to conserving biodiversity, and strengthening current approaches to conserving marine and freshwater species to provide consistent and holistic protection to Hong Kong's wide diversity of native flora and fauna has been a fundamental principle underlying this review.

Furthermore, new threats and challenges have emerged that require updates to the legislation. In particular, recommendations are made to address invasive alien species in a way that emulates

global best practice, to reduce impacts of the ongoing development of rural private lands on plants of conservation concern, and to support the government policy of transforming the marine capture fishery to sustainability.

The recommendations here were formulated with the consensus of experts in the non-governmental conservation community, and if followed will address all the major (and some more minor) areas required to unify and update the legislation relating to the protection of wild, native animals and plants for many years to come. Some of the changes will require the approval of the Legislative Council, but fundamentally we have managed to avoid the need for entirely new Ordinances. Furthermore, moving to consolidated lists for species of conservation concern, and invasive alien species, and having these inform the relevant Ordinances, will allow for faster responses to new threats at a species level in the future without legislative amendments. Following the recommendations would be a major contribution not just to meeting with the standards of the CBD, but also to securing the long-term conservation and sustainable use of Hong Kong's rich biodiversity, if done in parallel with progressive policies, and resources for enforcement.

5. REFERENCES

Agriculture, Fisheries and Conservation Department. 2011. *The Proposed Action Plan for the Conservation of Freshwater Fish in Hong Kong*. Advisory Council on the Environment Nature Conservation Subcommittee Discussion Paper (NCSC 1/2011). Prepared by AFCD Apr 2011.

Barretto G., P. Cribb and S. Gale. 2011. *Wild Orchids of Hong Kong*. Natural History Publications. pp. 697.

Chan B.P.L 2002. *Should freshwater fishes be protected by law?* Porcupine!, The Newsletter of the Department of Ecology and Biodiversity. The University of Hong Kong. Number 25 (May 2002).

Chan B.P.L., D. Dudgeon and X. Chen. 2008. *Threatened fishes of the world: Macropodus hongkongensis.* Environmental Biology of Fishes 81(4): 367-368.

Cheung W.L. and Y.J. Sadovy. 2004. *Retrospective evaluation of data-limited fisheries: a case from Hong Kong*. Reviews in Fish Biology and Fisheries 14(2): 181-206.

Cornish A.S. and D. McKellar. 1998. *A history of fishing with explosives and poisons in Hong Kong waters.* Naga, the ICLARM Quarterly, 21(3): 4-9.

Cornish, A. 2003a. *Epinephelus akaara*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. http://www.iucnredlist.org/details/43974/0. Downloaded on 27 August 2013.

Cornish A.S. 2003b. *Diadema sea urchins and the Black-spot tuskfish*. Porcupine!, The Newsletter of the Department of Ecology and Biodiversity. The University of Hong Kong. Number 28 (April 2003).

Department of Environment, Food and Rural Affairs. 2011. *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). General guidance notes for commercial use within the European Union (EU).* GN2 Feb 2011. Viewed 27 Aug 2013. www.defra.gov.uk/ahvla-en/files/cites-gn2.pdf.

Dudgeon D. and R. Corlett 2002. *The Biodiversity Survey of Hong Kong*. www.biosch.hku.hk/ecology/bs/pages/html/intro01.html. Downloaded on 20 May 2013.

Dudgeon D. and R. Corlett 2004. *The Ecology and Biodiversity of Hong Kong*. Friends of the Country Parks. pp 336.

Fellowes J.R., M.W.N. Lau, D. Dudgeon, G. Reels, G.W.J. Ades, G.J. Carey, B.P.L. Chan, R.C. Kendrick, K.S. Lee, M.R. Leven, K.D.P. Wilson, and Y.T. Yu. 2002. *Wild animals to watch: Terrestrial and freshwater fauna of conservation concern in Hong Kong*. Memoirs of the Hong Kong Natural History Society 25: 123-159.

Hopkinson L. 2012. *Developing a Biodiversity Strategy and Action Plan for Hong Kong.* Civic Exchange. pp 55.

Lee W.H. and I.C. Choi. 2005. *House Crows (Corvus splendens) - Notes on their Population and Control in Hong Kong.* Hong Kong Biodiversity: Issue 8: 10-11.

Lee W.H. and G.K.L. Chow 2007. *An update on the population control of House Crow (Corvus splendens) in Hong Kong*. Hong Kong Biodiversity: Issue 15: 11-15.

Minnesota Department of Natural Resources. 2013. *Species Profile, Common snapping turtle*. http://www.dnr.state.mn.us/rsg/profile.html?action=elementDetail&selectedElement=ARAAB01010. Downloaded 4 June 2013.

N.W. Chuen & W. Cheung. 2006. *Bahaba taipingensis*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. www.iucnredlist.org/details/61334/0. Downloaded on 27 August 2013.

Norman, B. 2005. *Rhincodon typus*. In: IUCN 2013. IUCN Red List of Threatened Species. Version 2013.1. www.iucnredlist.org/details/19488/0. Downloaded on 27 August 2013.

Sadovy Y. and A.S. Cornish. 2000. *Reef Fishes of Hong Kong*. Hong Kong University Press, pp 321.

Seminoff, J.A. 2004. *Chelonias mydas*. In: IUCN 2013. The IUCN Red List of Threatened Species. Version 2013.1. www.iucnredlist.org/details/4615/0. Downloaded on 27 Aug 2013.

van Dijk, P.P. 2012. *Chelydra serpentine* In: IUCN 2013. The IUCN Red List of Threatened Species. Version 2013.1www.iucnredlist.org/details/163424/0. Downloaded 4 June 2012.

Wilson K.D.P. 2001. *Don't stone the crows (more on alien invaders).* Porcupine! Newsletter of the Department of Ecology and Biodiversity, The University of Hong Kong. Number 24 (Dec 2001).

WWF-Hong Kong. 2007. *Green turtles face the end of the line in Hong Kong.* Press Release 31 May 2007.

Appendix 1

RECOMMENDED LIST OF HONG KONG SPECIES OF CONSERVATION CONCERN

This list is taken from Fellowes *et al.* (2002). While in need of updating and expansion to include marine species, adopting it would overcome some serious shortcomings in Schedule 2 of the WAPO.

Key to abbreviations and symbols: CR = Critically Endangered; EN = Endangered; VU = Vulnerable; LR = Lower Risk; nt = Near-threatened; restrictedness A, B, C etc. = confined to 1, 2, 3-4 etc. sites, IR = regional population irregular in Hong Kong; $ = scarce visitor in Hong Kong; ? = inadequate information on restrictedness; * = probably under-recorded; @ = population highly concentrated; # = in marked decline; ## = in drastic decline; < = origin of population uncertain; ^ = increasing; GC = Global Concern ; RC = Regional Concern; LC = Local Concern ; PGC = Potential Global Concern; PRC = Potential Regional Concern. Letters in parentheses indicate that the assessment is on the basis of restrictedness in breeding and/or roosting sites rather than in general occurrence.

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regi-onal rating	Local rating	Level of conc-ern
MAMMALIA							
Chiroptera							
Pteropodidae	*Rousettus leschenaulti*	Leschenault's Rousette Bat			?	(C) #	**(LC)**
Rhinolophidae	*Hipposideros armiger*	Great Roundleaf Bat			?	(D)	**(LC)**
	Hipposideros pomona	Bicolored Roundleaf Bat			?	(D)	**(LC)**
	Rhinolophus affinus	Intermediate Horseshoe Bat			?	(C)	**(LC)**
	Rhinolophus pusillus	Least Horseshoe Bat			B *	(C) #	**PRC (RC)**
	Tylonycteris pachypus	Lesser Bamboo Bat			?	(C) #	**(LC)**
Vespertilionidae	*Miniopterus magnater*	Western Bent-winged Bat			A *	(D)	**PRC (RC)**
	Miniopterus pusillus	Small Bent-winged Bat				(C)	**(LC)**
	Miniopterus schreibersi	Schreibers's Long-fingered Bat	**LR/nt**		?	(D)	**(LC)**
	Myotis chinensis	Large Myotis Bat		B		(D) #	**(LC)**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Myotis daubentoni	Daubenton's Bat			B *	(B) #	**(LC)**
	Myotis fimbriatus	Long-fingered Bat	**LR/nt**	B		(A) *	**(LC)**
	Myotis horsfieldii	Horsfield's Bat			A *	(A) *	**PRC (RC)**
	Myotis ricketti	Rickett's Big-footed Bat	**LR/nt**	B	B *	(C) #	**(LC)**
	Nyctalus noctula	Noctule Bat			A *	(B) *	**PRC (RC)**
	Pipistrellus pulveratus	Chinese Pipistrelle	**LR/nt**		?	(B) *	**(LC)**
	Scotophilus kuhlii	Lesser Asiatic Yellow Bat			?	(C) #	**(LC)**
Carnivora							
Mustelidae	*Lutra lutra*	Eurasian Otter	**VU**		##	B	**RC**
	Martes flavigula	Yellow-throated Marten			##	A	**RC**
	Mustela kathiah	Yellow-bellied Weasel				A	**LC**
Herpestidae	*Herpestes urva*	Crab-eating Mongoose			#	B	**LC**
Viverridae	*Paguma larvata*	Masked Palm Civet			##		**PRC**
Artiodactyla							
Cervidae	*Muntiacus muntjak*	Indian Muntjac			##		**PRC**
Pholidota							
Manidae	*Manis pentadactyla*	Chinese Pangolin	**LR/nt**	#	##	D	**RC**
Rodentia							
Muridae	*Bandicota indica*	Greater Bandicoot Rat				C *	**LC**
Hystricidae	*Hystrix brachyura*	Malayan Porcupine	**VU**	#	##		**PGC**
AVES							
Podicipediformes							
Podicipedidae	*Podiceps cristatus*	Great Crested Grebe			@	D	**RC**
	Tachybaptus ruficollis	Little Grebe				E	**LC**
Pelecaniformes							
Pelecanidae	*Pelecanus crispus*	Dalmatian Pelican	**LR/cd**		@ B #	B	**RC**
Phalacrocoracidae	*Phalacrocorax carbo*	Great Cormorant			@		**PRC**
Ciconiiformes							
Ardeidae	*Ardea cinerea*	Grey Heron			@		**PRC**
	Ardea purpurea	Purple Heron			B *	C(A)	**RC**
	Ardeola bacchus	Chinese Pond Heron			@	(E) #	**PRC (RC)**
	Botaurus stellaris	Great Bittern			B *	C	**RC**
	Bubulcus ibis	Cattle Egret			#	(D)	**(LC)**
	Butorides striatus	Striated Heron				(E)	**(LC)**
	Egretta alba	Great Egret			@	(C)	**PRC (RC)**
	Egretta eulophotes	Chinese Egret	**VU**	#	C # @	C	**GC**
	Egretta garzetta	Little Egret			@	(E)	**PRC (RC)**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Egretta intermedia	Intermediate Egret			B * #	D	**RC**
	Egretta sacra	Pacific Reef Egret			? $	(C)	**(LC)**
	Ixobrychus cinnamomeus	Cinnamon Bittern				D #	**LC**
	Ixobrychus eurhythmus	Schrenck's Bittern			B *	C	**RC**
	Ixobrychus flavicollis	Black Bittern			$	D	**LC**
	Ixobrychus sinensis	Yellow Bittern				(D) #	**(LC)**
	Nycticorax nycticorax	Black-crowned Night Heron				(D)	**(LC)**
Ciconiidae	*Ciconia boyciana*	Oriental Stork	**EN**	#	A #	B #	**GC**
	Ciconia nigra	Black Stork		#	? #	D #	**RC**
Threskiornithidae	*Platalea leucorodia*	Eurasian Spoonbill			C # $	D #	**LC**
	Platalea minor	Black-faced Spoonbill	**EN**	@^	C @^	E ^	**PGC**
	Threskiornis melanocephalus	Black-headed Ibis	**LR/nt**	#	A ##	D ##	**RC**
Anseriformes							
Anatidae	*Anas acuta*	Northern Pintail			? @ #	E	**RC**
	Anas clypeata	Northern Shoveler			@	E	**RC**
	Anas crecca	Common Teal			? @ #	E	**RC**
	Anas falcata	Falcated Duck			C * #	C ##	**RC**
	Anas penelope	Eurasian Wigeon			? @ #	E	**RC**
	Anas platyrhynchos	Mallard			C * #	D	**RC**
	Anas poecilorhyncha	Spot-billed Duck			C * #	E(C)	**RC**
	Aythya fuligula	Tufted Duck			C *	D	**LC**
	Mergus serrator	Red-breasted Merganser			C $	C #	**LC**
	Tadorna tadorna	Common Shelduck			C * @	D	**RC**
Falconiformes							
Pandionidae	*Pandion haliaetus*	Osprey			C	E	**RC**
Accipitridae	*Aquila clanga*	Greater Spotted Eagle	**VU**	#	A *	E	**GC**
	Aquila heliaca	Imperial Eagle	**VU**	#	A *	E	**GC**
	Circus melanoleucos	Pied Harrier			$	D	**LC**
	Circus spilonotus	Eastern Marsh Harrier			C *	E	**LC**
	Elanus caerulens	Black-winged Kite				E (A)	**LC**
	Haliaeetus leucogaster	White-bellied Sea Eagle			A *	(D)	**(RC)**
	Hieraaetus fasciatus	Bonelli's Eagle			C	(D)	**(RC)**
	Milvus migrans	Black Kite			@ #	(D)	**(RC)**
	Pernis ptilorhynchus	Oriental Honey Buzzard			$	D	**LC**
	Spilornis cheela	Crested Serpent Eagle				(E)	**(LC)**
Falconidae	*Falco peregrinus*	Peregrine Falcon				(D)	**(LC)**
	Falco subbuteo	Eurasian Hobby			$	(A)	**(LC)**
Galliformes							
Phasianidae	*Coturnix japonica*	Japanese Quail				C	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
Gruiformes							
Rallidae	*Amaurornis akool*	Brown Crake				D	**LC**
	Fulica atra	Eurasian Coot			? @ #	D #	**RC**
	Gallicrex cinerea	Watercock			? #	D #	**RC**
	Porzana fusca	Ruddy-breasted Crake			D * # $	D	**LC**
	Rallus aquaticus	Water Rail			D * # $	D	**LC**
	Rallus striatus	Slaty-breasted Rail			C * #	E	**RC**
Charadriiformes							
Jacanidae	*Hydrophasianus chirurgus*	Pheasant-tailed Jacana			?	C #	**LC**
Rostratulidae	*Rostratula benghalensis*	Greater Painted-snipe			C *	C	**LC**
Recurvirostridae	*Himantopus himantopus*	Black-winged Stilt			C * @	D	**RC**
	Recurvirostra avosetta	Pied Avocet			C * @	C	**RC**
Glareolidae	*Glareola maldivarum*	Oriental Pratincole				D	**LC**
Charadriidae	*Charadrius alexandrinus*	Kentish Plover			C * @	C	**RC**
	Charadrius dubius	Little Ringed Plover				(D)	**(LC)**
	Charadrius leschenaultii	Greater Sand Plover			C * @	C	**RC**
	Charadrius mongolus	Lesser Sand Plover			C *	C	**LC**
	Charadrius veredus	Oriental Plover			A * $	B	**LC**
	Pluvialis dominica	Pacific Golden Plover			C *	D	**LC**
	Pluvialis squatarola	Grey Plover			C * @	C	**RC**
	Vanellus cinereus	Grey-headed Lapwing				C ##	**LC**
	Vanellus vanellus	Northern Lapwing			C * $	C	**LC**
Scolopacidae	*Arenaria interpres*	Turnstone			C *	C	**LC**
	Calidris acuminata	Sharp-tailed Sandpiper			C *	D	**LC**
	Calidris alba	Sanderling			C * $	C	**LC**
	Calidris alpina	Dunlin			C * @	C	**RC**
	Calidris canutus	Red Knot			C *	C	**LC**
	Calidris ferruginea	Curlew Sandpiper			C * @	D	**RC**
	Calidris melanotus	Pectoral Sandpiper			A * $	C	**LC**
	Calidris minuta	Little Stint			A * $	C	**LC**
	Calidris ruficollis	Red-necked Stint			C *	D	**LC**
	Calidris subminuta	Long-toed Stint			C *	D	**LC**
	Calidris temminckii	Temminck's Stint			C *	D	**LC**
	Calidris tenuirostris	Great Knot			C *	C	**LC**
	Eurynorhynchus pygmaeus	Spoon-billed Sandpiper	**VU**	#	A *	B	**GC**
	Gallinago megala	Swinhoe's Snipe			C *	D *	**LC**
	Heteroscelus brevipes	Grey-tailed Tattler			C *	D *	**LC**
	Limicola falcinellus	Broad-billed Sandpiper			C *	C	**LC**
	Limnodromus semipalmatus	Asian Dowitcher	**LR/nt**		A *	C	**RC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Limosa lapponica	Bar-tailed Godwit			C *	C	**LC**
	Limosa limosa	Black-tailed Godwit			C * @	C	**RC**
	Numenius arquata	Eurasian Curlew			C * @	C	**RC**
	Numenius madagascariensis	Eastern Curlew	**LR/nt**		C * $	C	**LC**
	Numenius minutus	Little Curlew			A * $	C	**LC**
	Numenius phaeopus	Whimbrel			C *	C	**LC**
	Philomachus pugnax	Ruff			C * $	C	**LC**
	Tringa erythropus	Spotted Redshank			C * @	D	**RC**
	Tringa glareola	Wood Sandpiper			?	E	**LC**
	Tringa guttifer	Nordmann's Greenshank	**EN**	# @	A * @	B	**GC**
	Tringa nebularia	Common Greenshank			C * @	D	**RC**
	Tringa stagnatilis	Marsh Sandpiper			C * @	D	**RC**
	Tringa totanus	Redshank			C * @	E	**RC**
	Xenus cinereus	Terek Sandpiper			C * @	C	**RC**
Laridae	*Larus brunnicephalus*	Brown-headed Gull			A * $	B	**LC**
	Larus cachinnans	Yellow-legged Gull			?	C	**LC**
	Larus canus	Common Gull			A * $	B	**LC**
	Larus crassirostris	Black-tailed Gull			$	C	**LC**
	Larus heuglini	Heuglin's Gull			?	C	**LC**
	Larus ichthyaetus	Pallas' Gull			A * $	B	**LC**
	Larus ridibundus	Black-headed Gull			@		**PRC**
	Larus saundersi	Saunders' Gull	**VU**	#	B @	C	**GC**
	Sterna albifrons	Little Tern				E	**LC**
	Sterna caspia	Caspian Tern			C *	C #	**RC**
	Sterna dougallii	Roseate Tern				(A)	**(LC)**
	Sterna fuscata	Bridled Tern				(A)	**(LC)**
	Sterna sumatrana	Black-naped Tern				(B)	**(LC)**
Strigiformes							
Strigidae	*Bubo bubo*	Eurasian Eagle Owl			B * #	D	**RC**
	Ketupa zeylonensis	Brown Fish Owl			A * #	B	**RC**
Caprimulgiformes							
Caprimulgidae	*Caprimulgus indicus*	Grey Nightjar				E(C)	**LC**
Apodiformes							
Apodidae	*Apus pacificus*	Pacific Swift				(B)	**(LC)**
Coraciiformes							
Alcedinidae	*Ceryle lugubris*	Crested Kingfisher			C	D	**RC**
	Ceryle rudis	Pied Kingfisher				(D)	**(LC)**
	Halcyon pileata	Black-capped Kingfisher				(C) #	**(LC)**
	Halcyon smyrnensis	White-throated Kingfisher				(F) #	**(LC)**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
Piciformes							
Picidae	*Blythipicus pyrrhotis*	Bay Woodpecker				A	**LC**
	Picumnus innominatus	Speckled Piculet				B	**LC**
	Picus canus	Grey-headed Woodpecker				B	**LC**
Passeriformes							
Alaudidae	*Alauda gulgula*	Oriental Skylark			C *	E(B)##	**LC**
Motacillidae	*Anthus cervinus*	Red-throated Pipit			?	E	**LC**
	Anthus gustavi	Pechora Pipit			B * $	E	**LC**
	Anthus rubescens	Buff-bellied Pipit			? $	D	**LC**
	Motacilla citreola	Citrine Wagtail			$	D	**LC**
Campephagidae	*Pericrocotus cantonensis*	Swinhoe's Minivet		B	$ IR	D	**LC**
	Pericrocotus solaris	Grey-chinned Minivet				D	**LC**
Chloropseidae	*Chloropsis hardwickii*	Orange-bellied Leafbird				D	**LC**
Turdidae	*Brachypteryx leucophrys*	Lesser Shortwing				B	**LC**
	Turdus chrysolaus	Brown-headed Thrush		B	? $	E #	**LC**
	Turdus naumanni	Dusky Thrush			? IR	E #	**LC**
	Zoothera citrina	Orange-headed Thrush				C	**LC**
Cisticolidae	*Cisticola exilis*	Bright-capped Cisticola			$	D	**LC**
	Cisticola juncidis	Zitting Cisticola				E	**LC**
Sylviidae	*Acrocephalus aedon*	Thick-billed Warbler			B * $	E	**LC**
	Graminicola bengalensis	Large Grass Warbler	**LR/nt**		B *	E	**RC**
	Locustella certhiola	Pallas's Grasshopper Warbler				E	**LC**
	Locustella pleskei	Styan's Grasshopper Warbler	**VU**	A	A *	B	**GC**
	Phylloscopus reguloides	Blyth's Leaf Warbler				E	**LC**
Muscicapidae	*Culicicapa ceylonensis*	Grey-headed Flycatcher				E	**LC**
	Enicurus schistaceus	Slaty-backed Forktail				C	**LC**
	Luscinia cyane	Siberian Blue Robin			$	E	**LC**
	Luscinia svecica	Bluethroat				E #	**LC**
	Muscicapa ferruginea	Ferruginous Flycatcher			C		**PRC**
	Rhyacornis fuliginosus	Plumbeous Redstart			$	C	**LC**
	Saxicola ferrea	Grey Bushchat			$	E #	**LC**
Monarchidae	*Terpsiphone atrocaudata*	Japanese Paradise Flycatcher	**LR/nt**	B	B * $	E	**LC**
	Terpsiphone paradisi	Asian Paradise Flycatcher			B * $	E	**LC**
Timaliidae	*Babax lanceolatus*	Chinese Babax		B		C	**LC**
	Pnoepyga pusilla	Pygmy Wren Babbler				A	**LC**
	Stachyris ruficeps	Rufous-capped Babbler				D ^	**LC**
	Yuhina castaniceps	Striated Yuhina				(D <)	**(LC)**
	Yuhina zantholeuca	White-bellied Yuhina				D	**LC**
Paradoxornithidae	*Paradoxornis webbianus*	Vinous-throated Parrotbill				D <	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
Paridae	*Parus venustulus*	Yellow-bellied Tit		B	B * IR	D	**LC**
	Remiz consobrinus	Chinese Penduline Tit			A *	D ^	**RC**
Oriolidae	*Oriolus chinensis*	Black-naped Oriole				C #	**LC**
Dicruridae	*Dicrurus leucophaeus*	Ashy Drongo				E	**LC**
Corvidae	*Corvus torquatus*	Collared Crow			C *	E #	**LC**
	Dendrocitta formosae	Grey Treepie				D	**LC**
	Garrulus glandarius	Eurasian Jay				E #	**LC**
Sturnidae	*Sturnus cineraceus*	White-cheeked Starling			B *		**PRC**
	Sturnus sericeus	Red-billed Starling		B	? @	E @ #	**GC**
	Sturnus sinensis	White-shouldered Starling			?	(E) #	**(LC)**
	Sturnus sturninus	Purple-backed Starling			A * $	C	**LC**
	Sturnus vulgaris	Common Starling			A * $	D	**LC**
Fringillidae	*Carduelis sinica*	Grey-capped Greenfinch				D #	**LC**
	Carpodacus erythrinus	Common Rosefinch			C *	D #	**LC**
	Eophona migratoria	Yellow-billed Grosbeak				F #	**LC**
Emberizidae	*Emberiza arreola*	Yellow-breasted Bunting		#	? #	F #	**RC**
	Emberiza fucata	Chestnut-eared Bunting				D #	**LC**
	Emberiza sulphurata	Japanese Yellow Bunting	**VU**	B #	A * $	D	**GC**
	Melophus lathami	Crested Bunting				E ##	**LC**
REPTILIA							
Sauria							
Gekkonidae	*Gekko gecko*	Tokay Gecko		#	D #	D	**RC**
	Hemiphyllodactylus sp.			?	A	C	**RC**
Dibamidae	*Dibamus bogadeki*	Bogadek's Legless Lizard		A	A	C	**GC**
Scincidae	*Eumeces elegans*	Five-striped Blue-tailed Skink				D	**LC**
	Sphenomorphus indicus	Brown Forest Skink				D	**LC**
Varanidae	*Varanus salvator*	Water Monitor		#	##	C < #	**RC**
Serpentes							
Boidae	*Python molurus*	Burmese Python	**LR/nt**		##		**PRC**
Typhlopidae	*Ramphotyphlops albiceps*	White-headed Blind Snake			A *	D	**RC**
Colubridae	*Ahaetulla prasina*	Green Vine Snake				A <	**LC**
	Amphiesma atemporale	Mountain Keelback				C	**LC**
	Amphiesma boulengeri	White-browed Keelback		B		C	**LC**
	Amphiesma stolatum	Buff-striped Keelback				D #	**LC**
	Calamaria septentrionalis	Northern Reed Snake				C	**LC**
	Dendrelaphis pictus	Painted Bronze-back				B	**LC**
	Elaphe porphyracea	Red Mountain Racer				D	**LC**
	Elaphe radiata	Copperhead Racer			##		**PRC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Enhydris bennettii	Mangrove Water Snake		A		C	**LC**
	Lycodon ruhstrati	Ruhstrat's Wolf Snake				C	**LC**
	Oligodon cinereus	Ashy Kukri Snake				D	**LC**
	Opisthotropis andersonii	Anderson's Stream Snake		A	B *		**PGC**
	Opisthotropis kuatunensis	Striped Stream Snake		B	C *	D	**LC**
	Pareas chinensis	Chinese Slug Snake			C *	B	**LC**
	Ptyas korros	Indo-Chinese Rat Snake		#	##		**PRC**
	Ptyas mucosus	Common Rat Snake		#	##		**PRC**
	Rhabdophis nuchalis	Groove-necked Keelback			B *	A	**RC**
	Sibynophis chinensis	Chinese Mountain Snake				D	**LC**
	Sinonatrix aequifasciata	Diamond-backed Water Snake		B		D	**LC**
	Sinonatrix percarinata	Mountain Water Snake				D	**LC**
Elapidae	*Bungarus fasciatus*	Banded Krait		#	##	D	**RC**
	Bungarus multicinctus	Many-banded Krait		#	##		**PRC**
	Hemibungarus macclellandi	MacClelland's Coral Snake				D	**LC**
	Naja atra	Chinese Cobra		#	##		**PRC**
	Ophiophagus hannah	King Cobra		#	##		**PRC**
Viperidae	*Ovophis monticola*	Mountain Pit Viper				C	**LC**
	Protobothrops mucrosquamatus	Point-scaled Pit Viper				A	**LC**
Testudines							
Cheloniidae	*Chelonia mydas*	Green Turtle	**EN**	#	# #	(B) ##	**(GC)**
Emydidae	*Chinemys reevesii*	Chinese Three-keeled Pond Turtle	**EN**	##	##	#	**GC**
	Cuora trifasciata	Three-banded Box Turtle	**CR**	B ##	##	#	**GC**
	Sacalia bealei	Beale's Turtle	**EN**	B ##	##	C #	**GC**
Platysternidae	*Platysternon megacephalum*	Chinese Big-headed Turtle	**EN**	#	##	D	**GC**
Trionychidae	*Pelodiscus sinensis*	Chinese Softshell Turtle	**VU**	#	##	D #	**GC**
AMPHIBIA							
Anura							
Pelobatidae	*Leptolalax pelodytoides*	Mountain Short-legged Toad			C *	E	**LC**
	Megophrys brachykolos	Short-legged Toad		B	A *		**PGC**
Ranidae	*Amolops hongkongensis*	Hong Kong Cascade Frog		A	B *		**PGC**
	Occidozyga lima	Rough-skinned Floating Frog				A ##	**LC**
	Rana exilispinosa	Lesser Spiny Frog		B	C #		**PGC**
	Rana fujianensis	Big-headed Frog		B		D	**LC**
	Rana latouchii	Brown Wood Frog		B		E	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Rana rugulosa	Chinese Bullfrog		#	##	#	**PRC**
	Rana spinosa	Chinese Spiny Frog			#	A	**LC**
	Rana taipehensis	Two-striped Grass Frog				E	**LC**
Rhacophoridae	*Philautus romeri*	Romer's Tree Frog		A	A		**PGC**
Caudata							
Salamandridae	*Paramesotriton hongkongensis*	Hong Kong Newt		A	C		**PGC**
ACTINOPTERYGII							
Anguilliformes							
Anguillidae	*Anguilla marmorata*	Giant Marbled Eel		##	##	D * #	**GC**
Cypriniformes							
Balitoridae	*Schistura incerta*	Bandless Southern Loach		B #	#	A #	**LC**
Cyprinidae	*Acrossocheilus hemispinus*	Half-spined Thick-lipped Barb		A #	? #	A ##	**GC**
	Acrossocheilus beijiangensis	Beijiang Thick-lipped Barb		A #	? #	C #	**GC**
	Garra orientalis	Oriental Garra		B ##	#	A < ##	**LC**
	Opsariichthys bidens	Horse-mouth Chub		#	#	A <	**LC**
	Osteochilus vittatus	Striped Bony-lipped Barb		B #	? #	B #	**GC**
	Pseudorasbora parva	Topmouth Gudgeon		#	#	A ##	**LC**
	Rasbora steineri	Chinese Rasbora		A ##	? ##	B ##	**GC**
	Rasborinus formosae	Taiwan Lesser Bream		A ##	? ##	A ##	**GC**
	Rasborinus lineatus	Striped Lesser Bream		A #	? #	A ##	**GC**
	Rhodeus ocellatus	Rosy Bitterling		#	#	C ##	**LC**
Siluriformes							
Bagridae	*Pseudobagrus trilineatus*	Three-lined Chinese Stream Catfish		A #	? #	A #	**GC**
Sisoridae	*Glyptothorax pallozonum*	White-lined Chinese Chest-catfish		A #	? #	A	**GC**
Salmoniformes							
Osmeridae	*Plecoglossus altivelis*	Ayu		#	B ##	A ##	**RC**
Beloniformes							
Adrianichthyidae	*Oryzias curvinotus*	Curved-back Rice Fish		A ##	##	D ##	**GC**
Synbranchiformes							
Mastacembelidae	*Mastacembelus armatus*	Tire-track Spiny Eel		#	#	A ##	**LC**
Perciformes							
Kuhliidae	*Kuhlia marginata*	Rock Flagtail		#	A #	A #	**RC**
Gobiidae	*Awaous melanocephalus*	Black-headed Thick-lipped Goby		#	? #	C #	**RC**
	Rhinogobius cervicosquamus	Hainan Stream Goby		A #	? #	A ##	**GC**
	Stiphodon (cf. *multisquamus*) sp. 1	Neon Goby sp. 1		A #	A #	A #	**GC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Stiphodon atropurpureus	Philippine Neon Goby		B #	A #	C #	**GC**
Belontiidae	*Macropodus concolor*	Black Paradise Fish		B #	A #	D #	**GC**
Channidae	*Channa asiatica*	Chinese Moon Snakehead		B #	#	D #	**LC**
Tetraodontiformes							
Tetraodontidae	*Takifugu ocellatus*	Orange Peacock Puffer		B #	#	(A) #	**(LC)**
CRUSTACEA							
Decapoda							
Atyidae	*Caridina apodisis*			A	?	A	**LC**
	Caridina serrata			A	A	##	**GC**
Isolapotamidae	*Cryptopotamon anacoluthon*			A	A		**PGC**
	Nanhaipotamon hongkongense			A	A		**PGC**
Parathelphusidae	*Sommaniathelphusa zanklon*			A	A *	##	**GC**
INSECTA							
Coleoptera							
Dytiscidae	*Allopachria froehlichi*			A	A *	A	**GC**
Elmidae	*Cuspidevia velaris*			A	A *	B	**GC**
	Eonychus dudgeoni			A	A *	A	**GC**
	Sinonychus lantau			A	A *	A	**GC**
Eulichadidae	*Eulichas dudgeoni*			B	#	A	**LC**
Gyrinidae	*Dineutes australis*					? ##	**LC**
	Dineutes mellyi					? ##	**LC**
	Dineutes orienalis					? ##	**LC**
	Gyrinus orientalis					? ##	**LC**
	Orechtochilus melli			A		? ##	**LC**
	Orechtochilus productus			A		? ##	**LC**
	Orechtochilus sculpturatus			A	A	? ##	**GC**
	Orechtochilus severini			A		? ##	**LC**
Hydrophilidae	*Laccobius roseiceps*				A	?	**PRC**
	Pelthydrus dudgeoni			A	B	?	**PGC**
Diptera							
Simuliidae	*Simulium dudgeoni*			A	A	A	**GC**
	Simulium taipokauense			A	A	A	**GC**
Ephemeroptera							
Ephemerellidae	*Serratella albirostrata*			A	A *		**PGC**
	Teloganodes tristis				A	A	**RC**
	Torleya arenosa			A	A *		**PGC**
Heteroptera							
Belostomatidae	*Lethocerus indicus*				?	B ##	**LC**
Helotrephidae	*Trephotomas compactus*			B	A *	A	**GC**
Naucoridae	*Aphelocheirus dudgeoni*			A	A	A	**GC**
Hymenoptera							
Formicidae	*Dolichoderus sibiricus*					A *	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Pachycondyla amblyops				A	B	**RC**
	Pheidologeton melasolenus					A *	**LC**
	Pristomyrmex brevispinosus				A		**PRC**
	Pyramica sauteri			B	?	A *	**LC**
	Rotastruma stenoceps			A	B	A	**GC**
	Strumigenys heteropha			A	A *	A *	**GC**
	Tetraponera nitida				A	A	**RC**
Isoptera							
Termitidae	*Nasutitermes dudgeoni*			A	A		**PGC**
Lepidoptera							
Geometridae	*Axinoptera anticostalis*			A	?	A	**LC**
	Eupithecia sekkongensis	Shek Kong Pug		A	?	A	**LC**
	Maxates brevicaudata	Short-tailed Maxates		A	?	A	**LC**
	Microcalicha reelsi	Reels' Beauty		A	?	A	**LC**
	Spiralisigna gloriae	Gloria's Pug		A	?	A	**LC**
	Thalassodes maipoensis	Mai Po Jade		A	?	A	**LC**
Hesperiidae	*Aeromachus pygmaeus*	Pigmy Scrub Hopper			C	A	**RC**
	Ampittia virgata			B *		A	**LC**
	Badamia exclamationis	Brown Awl				C *	**LC**
	Caprona alida	Spotted Angle				D	**LC**
	Celaenorrhinus leucocera	Common Spotted Flat			?	C	**LC**
	Choaspes benjaminii	Indian Awl King				D	**LC**
	Choaspes hemixanthus	Orange Red Skirt				D	**LC**
	Halpe porus	Dark Brown Ace				D #	**LC**
	Hasora anura	Slate Awl				C	**LC**
	Hasora badra	Common Awl				D	**LC**
	Hasora vitta	Plain Banded Awl				D	**LC**
	Isoteinon lamprospilus	Shiny-spotted Bob				D	**LC**
	Pelopidas assamensis	Great Swift				D	**LC**
	Potanthus pseudomaesa	Common Dart				E #	**LC**
	Tagiades menaka					A	**LC**
	Taractrocera ceramas	Tamil Grass Dart				D	**LC**
	Telicota besta	Hainan Palm Dart				C	**LC**
	Telicota colon	Pale Palm Dart				E #	**LC**
	Zographetus satwa				C	A	**RC**
Lycaenidae	*Ancema ctesia*	Bi-spot Royal			?	B	**LC**
	Arhopala birmana	Burmese Bush Blue				D	**LC**
	Arhopala paramuta	Hooked Oak Blue				B	**LC**
	Arhopala pseudocentaurus	Centaur Oak Blue				A	**LC**
	Arhopala rama	Dark Himalayan Oak Blue				B ##	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Castalius rosimon	Common Pierrot				E #	**LC**
	Celastrina lavendularis	Plain Hedge Blue				D	**LC**
	Creon cleobis	Broadtail Royal			?	D	**LC**
	Dodona egeon	Orange Punch			B *	C	**RC**
	Flos asoka	Spangled Plush Blue			?	A ##	**LC**
	Freyeria putli	Grass Jewel				B ##	**LC**
	Horaga albimacula	Brown Onyx				C #	**LC**
	Leptotes plinius					B	**LC**
	Mahathala ameria	Falcate Oak Blue				D	**LC**
	Megisba malaya	Malayan				D ##	**LC**
	Miletus chinensis	Common Brownie				D	**LC**
	Pithecops corvus					A	**LC**
	Tajuria cippus	Peacock Royal				D	**LC**
	Tajuria maculata	Spotted Royal				C	**LC**
	Taraka hamada	Lesser Forest Blue				D	**LC**
	Udara dilecta	Pale Hedge Blue				D	**LC**
Noctuidae	*Athetis bispurca*	Two-spot Marsh Moth		A	?	A	**LC**
	Chasmina sinuata			A	?	A	**LC**
	Egira ambigua			A	?	A	**LC**
	Feliniopsis hyperythra				?	A *	**LC**
	Feliniopsis margarita			B *	?	B	**LC**
	Luceria striata			A	?	A	**LC**
	Schrankia bilineata	Two-line Snout		A	?	B	**LC**
Nymphalidae	*Athyma cama*	Orange Staff Sergeant				A	**LC**
	Athyma ranga	Blackvein Sergeant				D	**LC**
	Charaxes marmax	Yellow Rajah				D	**LC**
	Cirrochroa tyche	Common Yeoman				D #	**LC**
	Dichorragia nesimachus	Constable				D	**LC**
	Euploea sylvester	Double-branded Black Crow				A	**LC**
	Euthalia aconthea	Baron				D	**LC**
	Hypolimnas anomala	Malayan Egg-fly			A *	A	**RC**
	Hypolimnas misippus	Danaid Egg-fly				D	**LC**
	Kallima inachus	Orange Oakleaf				D	**LC**
	Lethe verma	Straight-banded Tree Brown				B	**LC**
	Moduza procris	Commander				D	**LC**
	Neptis soma	Sullied Sailor			?	C	**LC**
	Parantica melaneus	Chocolate Tiger				B	**LC**
	Sephisa chandra					A	**LC**
	Tirumala septentrionis	Dark Blue Tiger				C *	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Vagrans egista	Vagrant				C ##	**LC**
	Vanessa cardui	Painted Lady				D	**LC**
	Ypthima motschulskyi	Large Three-ring				C	**LC**
	Ypthima norma	Small Three-ring				C ##	**LC**
	Ypthima praenubila	Common Four-ring		B		C	**LC**
Papilionidae	*Graphium cloanthus*	Glassy Bluebottle				D	**LC**
	Lamproptera curius	White Dragontail				D	**LC**
	Papilio dialis			B	?	B	**LC**
	Parides alcinous	Chinese Windmill				B ##	**LC**
	Troides aeacus	Golden Birdwing				D	**LC**
Pieridae	*Appias albina*	Common Albatross				D	**LC**
	Appias lyncida	Chocolate Albatross				D #	**LC**
	Delias acalis	Red-breast Jezebel				D	**LC**
	Delias belladonna	Hill Jezebel				C	**LC**
	Eurema brigitta	Small Grass Yellow				E #	**LC**
	Leptosia nina	Psyche				B	**LC**
	Prioneris philonome	Red-spot Sawtooth				B	**LC**
	Prioneris thestylis	Spotted Sawtooth				D	**LC**
Sesiidae	*Toleria sinensis*	Bowring's Clearwing		A	?	A	**LC**
Tortricidae	*Phalonidia pista*			A	?	A	**LC**
	Stenodes hapala			B	?	A	**LC**
Odonata							
Diphlebiidae	*Philoganga vetusta*			A		E	**LC**
Calopterygidae	*Mnais mneme*			B		E	**LC**
Lestidae	*Lestes nodalis*					A	**LC**
Megapodagrionidae	*Agriomorpha fusca*			A		E	**LC**
	Rhipidolestes janetae			A	A	A	**GC**
Coenagrionidae	*Aciagrion tillyardi*					A	**LC**
	Agriocnemis lacteola					C	**LC**
	Cercion calamorum			B		C	**LC**
	Cercion sexlineatum					A	**LC**
	Mortonagrion hirosei		**EN**	B	C	C	**GC**
	Pseudagrion microcephalum					B	**LC**
	Pseudagrion spencei					C	**LC**
Platycnemididae	*Calicnemia sinensis*			A		D	**LC**
Platystictidae	*Drepanosticta hongkongensis*			A	B	E	**GC**
	Protosticta beaumonti			A	B	C	**GC**
	Protosticta taipokauensis			A	B	D	**GC**
	Sinosticta ogatai			A	B	D	**GC**
Protoneuridae	*Prodasineura croconota*			B		E	**LC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
Aeshnidae	*Gynacantha japonica*					C	**LC**
	Gynacantha saltatrix			B		C	**LC**
	Gynacantha subinterrupta			B		C	**LC**
	Polycanthagyna erythromelas					C	**LC**
Gomphidae	*Anisogomphus koxingai*			B		A	**LC**
	Burmagomphus vermicularis			B		C	**LC**
	Gomphidia kelloggi			A	B	A	**GC**
	Heliogomphus scorpio			A		E	**LC**
	Labrogomphus torvus			A		B	**LC**
	Lamelligomphus hainanensis			A		B	**LC**
	Leptogomphus elegans			A		E	**LC**
	Megalogomphus sommeri			B		D	**LC**
	Melligomphus moluami			A	A	D	**GC**
	Paragomphus capricornis				A	B	**RC**
	Stylogomphus chunliuae			B		E	**LC**
	Sieboldius sp.			A *	A *	A *	**GC**
Corduliidae	*Idionyx claudia*			A	C	A	**GC**
	Idionyx victor			A		E	**LC**
	Macromia berlandi			B		B	**LC**
	Macromia katae			A	C	B	**GC**
	Macromia urania		**EN**	?	?	D	**GC**
	Macromidia ellenae			A	A	B	**GC**
Libellulidae	*Diplacodes nebulosa*					C	**LC**
	Macrodiplax cora					B	**LC**
	Nannophya pygmaea					D	**LC**
	Nannophyopsis clara			B		B	**LC**
	Onychothemis testacea			B		A	**LC**
	Orthetrum poecilops			B	C	B	**GC**
	Potamarcha congener					D	**LC**
	Rhodothemis rufa					C	**LC**
	Rhyothemis triangularis					D	**LC**
	Urothemis signata					D	**LC**
	Zygonyx asahinai			B	C	D	**GC**
	Zygonyx iris			A	C		**PGC**
Plecoptera							
Perlidae	*Neoperla han*			A	?	A	**LC**
Trichoptera							
Calamoceratidae	*Georgium japonicum*			B *	A *	A ##	**RC**
Hydropsychidae	*Cheumatopsyche ventricosa*			A	A *		**PGC**
	Herbertorossia quadrata			A	A *		**PGC**
Hydroptilidae	*Hydroptila cuneata*			A	A *	A	**GC**

Taxon	Scientific name	English common name	Global Red List category (IUCN)	Global rating	Regional rating	Local rating	Level of concern
	Hydroptila quinaria			A	A *	A	**GC**
	Hydroptila triangularis			A	A *	B	**GC**
	Orthotrichia obtecta			A	A *	A	**GC**
	Oxyethira cotula			A	A *	A	**GC**
	Scelotrichia levis			A	A *	A	**GC**
	Stactobia parva			A	A *	A	**GC**
	Ugandatrichia spinata			A	A *	A	**GC**
Xiphocentronidae	*Melanotrichia serica*			A	A		**PGC**
GASTROPODA							
Mesogastropoda							
Cyclophoridae	*Chlamalycaeus latecostatus*			A	B	A	**GC**
	Lagochilus pellicosta			A	B		**PGC**
Diplommatinidae	*Diplommatina paxillus mucronata*			?	?	A *	**LC**
Pupinidae	*Pupina pulchella*			A	B	C	**GC**
Stylommatophora							
Camaenidae	*Chloritis hungerfordiana rufopila*			A	A	C	**GC**
Clausiliidae	*Euphaedusa lorraini elongata*			A		A	**LC**
	Euphaedusa porphyrea			A		A	**LC**
Corillidae	*Plectopylis pulvinaris pulvinaris*			A		B	**LC**
Helixarionidae	*Kaliella depressa*			A		C	**LC**
	Kaliella hongkongensis			A	A	C	**GC**
	Macrochlamys nitidissima			A	A	C	**GC**
	Microcystina schmackeriana			A	A	B	**GC**
	Moellendorffia trisinuata sculptilis			A	B		**PGC**
Rhytididae	*Macrocycloides crenulata*			A	A	#	**PGC**
Subulinidae	*Allopeas pyrgula*			?	?	A	**LC**