

Proposal for Wild Harvest and Export of Invertebrates submitted for approval under the *Environment Protection and Biodiversity Conservation Act 1999*

1. Introduction

In 1982, the applicants who recognised the full potential and value of the property to the initial establishing of their insect farming business purchased 80 acres of dense lowland rainforest. Areas of the property, prior to its purchase by the applicants, had been used for extractive processes such as a quarry and for logging. Other past activities that also affected the integrity of the property were cattle grazing and an attempt at establishing a deer farm. A total of 20 acres were clear felled to enable the cattle grazing and deer farming to occur.

To assist recovery of the acreage, surveys were conducted and relevant areas for rehabilitation were identified and addressed. The past 30 years has seen an astounding proliferation of fauna numbers as well as an improvement of habitat for many species.

Priority to land management is a key factor in the efficiency of the farm and its projects. Areas within the acreage have been identified and allocated to allow for the farm activities while maintaining the bulk of the acreage for non-business practices. Present operations are conducted on approximately 20 acres. This area lies within a section of the property, which was 75 years earlier totally cleared for cattle grazing and a typical example of regrowth rainforest. The property is listed under "Land for Wildlife" Queensland.

This business has grown from what was initially established to operate as a breeding facility, catering to public demand for invertebrate specimens for use in research, education, natural history documentaries, personal interests and various other applications. The applicants identified a need and adopted an approach necessary to the management of invertebrates in commercial trade.

The farm's main operations are research and education, which are regarded as the future direction of the business. The objective of all education programmes is to improve the level and delivery of insect education for all age levels.

The harvesting of invertebrates from this property has been in operation since 1993. Since that time the applicants have developed a conservational based and ecologically sustainable business with the following objectives:

- To increase invertebrate awareness, appreciation and knowledge of invertebrate fauna;
- To cater for professional and amateur entomologists to source invertebrate specimens for taxonomic, biological, ecological and conservation research;
- To cater for school, educational institutions and public display centres as a source of specimens and information for educational purposes; plus a new insect club for school aged children is proving popular.
- To promote invertebrate conservation and habitat management through education and research;
- To establish working relations with professional entomologists, government departments and relevant ministers;
- To promote the beauty and economic value of the overall project as a habitat management guide for government departments.

Export of specimens harvested on this property was first approved by the Federal Government in 1995. The previous approval included the harvesting of invertebrates from two (2) properties. This proposal covers the harvesting from two (2) properties.

Annual surveys have been conducted on the Garradunga and Mt Garnet properties for a minimum period of 10 years. During this time the applicants have conducted considerable research into species biology, distribution and population abundance, ecological and scientific significance.

a. Taxa covered

This proposal covers the harvest of species included in the taxa listed in Attachment A except for species listed under the EPBC Act as threatened (excluding the conservation dependent category) or listed as endangered or vulnerable under Queensland legislation. The list includes an annual quota that must not be exceeded.

The list can be amended by the Department of the Environment if additional information becomes available on a particular taxa or species within those taxa. The list can be amended by:

- reducing the quota or stopping the harvest of a particular taxa or species; or
- including conditions relating to the harvest or export of that taxa or species.

The list is amended when the Department of the Environment has notified the proponent of the amendment in writing.

b. Location of harvest

- 80 acres near Innisfail, North Queensland;
- 100sq miles near Mount Garnet, west Atherton Tablelands, North Queensland

c. Description of what is being harvested

Specimens are caught live. Only perfect adult specimens collected. Damaged specimens e.g. broken antennae, tarsi (claws), legs, scratched wings etc, are released or not collected and left for future breeding stock.

d. Is the species protected under State or Federal legislation?

The proponent will not harvest any species listed under the EPBC Act as threatened (excluding the conservation dependent category) or listed as endangered or vulnerable or least concern under Queensland legislation.

Queensland does not protect non-listed invertebrates and therefore these species are unprotected under Queensland legislation. Under Federal legislation the only protection to these species relates to the export of native wildlife.

2. Statement of general goal/aims

- To continue research and biology documentation of northern invertebrate species;
- To promote invertebrate conservation and habitat management through education and research.

Operating primarily as a research centre, the privately owned farm generates its income from both commercial harvesting and breeding. The farm receives no outside funding. Research notes are published regularly in newsletters available on the Internet. An initiative of the farm was to make insect education available to all schools. The farm has developed insect biology study kits which have been widely accepted in schools, other educational institutions and also by the general public, Australia wide. Informative newsletters published on the Internet are available to both the general public and the research sector.

3. Harvest Details

- a. Details of the area where harvesting is to take place**
- 80 acres of dense tropical lowland rainforest, insect farm near Innisfail;
 - 100 sq miles open Eucalypt/Iron Bark/interspersed with Alphitonia, Acacia, Bursaria and many other species, cattle station near Mount Garnet

b. Details of land ownership

Properties are freehold title.

c. Quantity intended on harvesting

The amount harvested will depend on demand. However, there are annual quotas set for each species within taxa. Refer to Attachment A for list of taxa and quotas.

d. Method of harvesting and equipment used

1. Light Attracting: Lights are used to attract insects, not to trap. A light is suspended in front of a white sheet, which the insects rest upon. Unharvested insects fly away when light is either turned off or daylight appears.

2. Baited Fruit Traps: Fresh fruit is placed in a container, attracting beetles to feed. Beetles are caught live, unwanted material is released daily.

3. Butterfly Net

4. Hand

All specimens are caught live. Any unsuitable specimens released unharmed.

e. Timing and duration of harvesting period:

All year round

4. Impact of Harvest on the Taxa and the Relevant Ecosystem

It is not possible to quantify invertebrate populations in the same way as vertebrate populations. The numbers and species of insects flying in a particular area each night will fluctuate dramatically according to a whole range of environmental factors, including weather conditions, which have no bearing whatsoever on the population status of the species. Insect biology is such that a species can be numerous one year and then scarce or absent the following year. The scarcity or absence of a particular species in an area where it was numerous the previous year is not necessarily any indication of a declining conservation status. Where surveys show a decrease in numbers the applicants will consider the biology of that species/group to determine if the harvest should be reduced.

Land management practices used within the individual properties are designed to maintain the biodiversity, thus securing the conservation status of all species present. Operating on suitably sized acreage with healthy habitat is crucial in operating all harvest projects. Such habitat lends itself to establishing a sustainable harvest while having no effect or impact on the existing habitat or fauna. Invertebrates in general are well known for their capability to breed in large numbers. Combine the factors of large sized acreage; low harvest numbers and the 'harvest only on demand' principal makes for an ecologically sustainable practice.

The landholders have applied sound land management practices to ensure the ongoing livelihood for themselves and their families. These landholders have learnt to manage their land to enable the feeding of cattle yet not to have a detrimental affect on the natural habitat. E.g. no obtrusive actions such as clear felling takes place. Farmers have recognised the importance of natural habitat that allows a continual food supply for the use of cattle grazing. These farmers have studied and learnt from other past land clearing practises that after clearing

natural habitat the regrowth comes back tenfold therefore making the land unsuitable for grass growth and cattle grazing.

The properties where the harvest occurs are relatively large and the trapping activities by the proponents only affect a very small part of the property. Impact on the taxa is minimised as all specimens are caught live and only the needed specimens are kept. The remaining animals are released back into the wild. Harvesting methods also have minimal impact on the environment.

In assessing the impact of the harvest it is important to note that the mortality from the harvest is likely to be insignificant when compared to other mortalities such as use of pesticides in agricultural areas and insect traps used by individuals during the summer to attract and electrocute insects.

5. Monitoring and Assessment

Regular surveys on species frequency within the properties are used to monitor harvest impact. Results from these surveys show that the current low-level of harvesting is not detrimental to species continually occurring well within their average population numbers for individual properties. In effect with seasonal factors, fluctuations in species abundance do naturally occur. Acting in accordance to survey results, harvest numbers for a particular species can be revised and dramatically reduced, even to the point of specimens not being harvested at all.

Keeping records of harvested specimens will give us information useful for future harvest operations. A continually building reference collection of all species harvested also assists in recording biology frequency.

Yearly surveys are conducted on all properties with most having been surveyed for a period of ten years prior to application. This allows for extended knowledge of the fauna and the environmental needs there of.

6. Management Strategies

Specimens are harvested only as required. In general, records show specimens harvested annually have not exceeded one hundred (100) of any given species.

In the case of Lepidoptera (butterflies & moths): Where possible some female specimens are gathered, eggs retained and female released. Progeny is reared to adult which are used for commercial sale or where required to initiate a captive breeding programme.

7. Compliance

There is no independent monitoring of the harvest as the Queensland Government does not regulate the harvest of non-protected invertebrates. However, it is a reputable family business which has operated for over 10 years supplying only legally obtained material. Harvest operation is conducted by the applicants' family members (3 persons). Through ongoing research all family members have acquired extensive information and knowledge on northern invertebrate fauna and are experienced in identifying species. If a taxonomic classification of a specimen is unclear the applicants will have the specimens identified prior to commercially exporting any specimens.

8. Reports

The proponent will report to the Department of the Environment annually on harvest. The report will provide harvest details for each species by month for each property. The applicants will provide additional reports to Department on particular taxa if required by the Department.

Attachment A

Taxa covered by the proposal. Relevant to properties at Garradunga, Mt Garnet.

Note: The proponent can harvest any species included in the taxa listed except for species listed under the EPBC Act as threatened (excluding the conservation dependent category) or listed as endangered, vulnerable or least concern under Queensland legislation. A list of species currently listed as endangered, vulnerable and least concern under Queensland legislation is included at the end of the table.

The list can be amended by the Department of the Environment if additional information becomes available on a particular taxa or species within that taxa. The list can be amended by:

- reducing the quota or stopping the harvest of a particular taxa or species; or
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TAXA COVERED	ANNUAL QUOTA PER SPECIES PER PROPERTY	BIOLOGY NOTES
<i>CLASS: INSECTA</i>		
<i>ORDER: BLATTODAE (cockroaches)</i>		
Family: Blattidae	200	Most species associated with surface leaf litter
Family: Blaberidae	200	same information as Blattidae (above)
<i>ORDER: COLEOPTERA (Beetles)</i>		
Family: Carabidae Common name: Ground beetles	200	Predatory beetles; feeding day or night; diet consists of other insects and small invertebrates.
Family: Buprestidae Common name: Jewel beetles	200	Beetles breed in live, dying and dead trees. Adults feed on leaves and nectar from flowers.
Family: Scarabaeoidae Common name: Scarab beetles including: Christmas beetles, Flower Scarabs; Cane beetles; Rhinoceros beetles; Dung beetles;	200	Many adults feed on foliage, sap flows or flowers of various rainforest trees also Eucalypt; Melaleuca and Bursaria trees; Larva in soil feeding on plant roots and decomposing organic matter.
Family: Dytiscidae Common name: Water beetles	200	Predacious diving beetles; living in streams and dams. Larva predatory; under stones.
Family: Cerambycidae Common name: Longhorn beetles	200	Beetles attack and kill injured plants and trees; larva eventually and usually kills the host plant before emerging.
Family: Curculionidae Common name: Weevils	200	Beetles eat all stages of dying wood, plant material, flowers, fruit and animal faeces.
Family: Callirhipidae	200	Larvae feed in rotten logs.
Family: Rhipiphoridae Common name: Hump back beetles	200	Nymphs are predatory; feeding on other insects, some feed on fungi and in logs.
Family: Tenebrionidae Common name: Pie Dish beetles	200	Adults feed on dead organic matter; larva feed on same in soil.

TAXA COVERED	ANNUAL QUOTA PER SPECIES PER PROPERTY	BIOLOGY NOTES
Family: Elateridae Common name: Click beetles	200	Adults feed on nectar of flowering trees; larva is predacious on other beetle larva.
Family: Staphylinidae Common name: Rove beetles	200	Feed on other insects, plant material or dead vertebrate carcasses; fly larva associated.
Family: Silphidae Common name: Carrion beetles	200	Feed on dead vertebrate carcasses; fly larva associated. Some species may feed on snails and others on caterpillars and crops.
Family: Lucanidae Common name: Stag beetles	200	Adults feed on sap flows, flowers and fruit. Larva completes its development in rotten logs.
Family: Cicindelidae Common name: Tiger beetles	200	Adults predacious; day or nocturnal; larva lives in open vertical burrows predated on ants and ground insects.
Family: Passalidae Common name: Passalid beetles	200	Adults living in rotten logs; maternal care shown to larva.
Family: Mordellidae: Tumbling flower beetles	200	Adults feed on flowers. Larvae are either stem borers or feeding in rotten wood and fungi.
Family: Chrysomelidae Common name: Leaf beetles	200	Adults feed on leaves of numerous trees and shrubs. Larvae feed on same as adults.
Family: Geotrupidae: Earth-boring dung beetles	200	Larvae feed on humus, fungi or dung.
Family: Trogidae Common name: Carcass beetles	200	Adults fly to light and can be commonly found around dry animal carcasses.
ORDER: LEPIDOPTERA (Butterflies; Moths)		
Family: Anthelidae Common name: Moths	200	Caterpillars feed on host plant foliage; many species accept the foliage of more than one host plant species as food. Some adults don't feed, others feed on flowers, fruit, sap flows. Depending on species, a single butterfly or moth can produce from 100 to 800 + ova (eggs).
Family: Saturniidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Noctuidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Uraniidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Geometridae Common name: Moths	200	Same information as Anthelidae (above)
Family: Sphingidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Hepialidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Cossidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Arctiidae Common name: Moths	200	Same information as Anthelidae (above)

TAXA COVERED	ANNUAL QUOTA PER SPECIES PER PROPERTY	BIOLOGY NOTES
Family: Aganaidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Pieridae Common name: Butterflies	200	Same information as Anthelidae (above)
Family: Notodontidae Common name: Moths	200	Same information as Anthelidae (above)
Family: Lycaenidae Common name: Butterflies	200	Same information as Anthelidae (above)
Family: Nymphalidae Common name: Butterflies	200	Same information as Anthelidae (above)
Family: Papilionidae Common name: Butterflies	200	Same information as Anthelidae (above)
Family: Hesperidae Common name: Butterflies	200	Same information as Anthelidae (above)
ORDER: ORTHOPTERA (Crickets; Grasshoppers)		
Family: Pyrgomorphidae	200	Feeding on a wide variety of plant material e.g.: grasses, bushes, trees and dead leaves to lichens, algae and bark.
Family: Tettigoniidae	200	Same information as Pyrgomorphidae (above)
Family: Gryllacrididae	200	Same information as Pyrgomorphidae (above)
Family: Acrididae	200	Same information as Pyrgomorphidae (above)
ORDER: HYMENOPTERA (Bees; Wasps; Ants)		
Family: Formicidae Common name: Ants	200	Some ants forage on trees and shrubs for honeydew produced by sap sucking bugs others are predators feeding on other insects and small prey.
Family: Apidae Common name: Bees	200	Bees feed larvae on pollen.
Family: Chrysididae Common name: Wasps	200	Most wasp larvae feed on other insects or spiders; some as parasites others inside a nest with prey.
ORDER: DIPTERA (Flies)		
Family: Platystomatidae Common name: Signal flies	200	Most larvae feed on decaying organic matter either animal or plant, some feed on living plants, or are predators and parasites of insects. Adults feed on fluids such as mammalian blood, nectar or solid material e.g. carrion.
ORDER: HEMIPTERA (Sucking bugs)		
Family: Tessaratomidae	200	All feed on liquid food e.g. plant juices, some predatory feeding on juices from other small insects.
Family: Belostomatidae	200	Same information as Tessaratomidae (above)
Family: Cicadidae	200	Same information as Tessaratomidae (above)
ORDER: ODONATA (Dragonflies)		
Family: Aeshnidae	200	Adults are predators, feeding on insects, spiders. Larvae also predators, feeding on aquatic invertebrates, tadpoles, small fish.
Family: Austrocorduliidae	200	As above

TAXA COVERED	ANNUAL QUOTA PER SPECIES PER PROPERTY	BIOLOGY NOTES
Family: Corduliidae	200	As above
Family: Lestoideidae	200	As above
Family: Gomphidae	200	Same information as above
Family: Libellulidae	200	Adults are predators, feeding on insects, spiders. Larvae also predators, feeding on aquatic invertebrates, tadpoles, small fish.
Family: Lindeniidae	200	Same information as Libellulidae (above)
Family: Petaluridae	15	Same information as Libellulidae (above)
Family: Telephlebiidae	200	Same information as Libellulidae (above)
ORDER: MANTODEA (Mantids)		
Family: Mantidae	200	Adults can be found sitting on plant foliage. They are difficult to see because of their camouflage and it takes a trained eye to see them. Adults are attracted to lights.
ORDER: PHASMATIDA (Stick insects)		
Family: Diapheromeridae	200	Adults and nymphs are foliage feeders
Family: Phasmatidae	200	same as above
Family: Phyllidae	200	same as above
CLASS GASTROPODA (Phylum: Mollusc)		
SUPER ORDER: STYLLOMMATOPHORA (Land Living Snails)		
Family: Camaenidae * Quota relates to all species included in family except for species listed below	50*	Most feed on vegetation, some carnivorous eating other snails.
Species: <i>Rhynchotrochus macgillivrayi</i> (common tree snail)	100	Feed on moss lichens and fungi
Species: <i>Hadra webbi</i> (Atherton Tableland Bicoloured Snail)	100	Feeds on dead and live vegetation
CLASS ARACHNIDA		
ORDER: SCORPIONINAE (Scorpions)		
Family: Hormuridae	200	All predators, feeding on insects, small prey, spiders.
**ORDER: ARANEAE (Spiders)		

TAXA COVERED	ANNUAL QUOTA PER SPECIES PER PROPERTY	BIOLOGY NOTES
FAMILY: Araneidae	200	All predators, feeding on insects.
FAMILY: Argiopidae	200	All predators, feeding on insects
FAMILY: Thomisidae	200	All predators, feeding on insects.
FAMILY: Salticidae	200	All predators, feeding on insects
FAMILY: Sparassidae	200	All predators, feeding on insects
<i>CLASS MYRIOPODA</i>		
ORDER: DIPLOPODA (Millipedes)		
Family: Rhinocricidae	200	Feeding on decomposing organic matter.
ORDER: CHILOPODA (Centipedes)		
Family: Scolopendridae	200	Predatory, feeding on live insects, lizards.

SPECIES PROTECTED UNDER QUEENSLAND LEGISLATION – NOT HARVESTED

Endangered Species

Argyreus hyperbius inconstans

Hypochrysops piceatus

Vulnerable Species

Acrodipsas illidgei

Hypochrysops apollo apollo

Jalmenus eubulus

Nacaduba pactolus cela

Ornithoptera richmondia

Least Concern Species

Family	Species	Common name (if applicable)
Hesperiidae	<i>Allora doleschallii doleschallii</i>	peacock awl butterfly
	<i>Chaetocneme sphinterifera sphinterifera</i>	banded dusk-flat butterfly
	<i>Euschemon rafflesia alba</i>	
	<i>Trapezites symmokus sombra</i>	
Lycaenidae	<i>Hypochrysops elgneri barnardi</i>	
	<i>Liphyra brassolis major</i>	moth butterfly
Papilionidae	<i>Ornithoptera</i> spp. (other than <i>Ornithoptera richmondia</i>)	birdwing butterflies (other than the Richmond birdwing butterfly)
	<i>Papilio ulysses joesa</i>	Ulysses butterfly