

Wildlife Trade Operation Proposal - Harvest and Export of Native Wildlife

1. INTRODUCTION

This is a Wildlife Trade Operation (WTO) proposal for the small-scale sustainable wild-harvest of the native fruit Kakadu Plum (*Terminalia ferdinandiana*) from State land at Gunn Point, Northern Territory, for ongoing export for a niche market. The relevant legislation for this project includes the State *Territory Parks and Wildlife Conservation Act*, the *Parks and Wildlife Commission Act* and the Federal *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act). This proposal is part of an application for renewal of an existing Wildlife Trade Operation granted to Southern Cross Botanicals in March, 2018.

1.1. Plant species

Scientific name	Common name	Harvested plant part	Harvest method
<i>Terminalia ferdinandiana</i> (Combretaceae)	Kakadu plum	Ripe fruit	By hand

1.2. Location of harvest

The location of the proposed wild-harvest is primarily State land located at Gunn Point, approximately 75 kilometres north-east of Darwin in the Northern Territory (approximate coordinates [redacted] x [redacted]). The land portion is identified as Code 2358 - NT Portion 2626 Gunn Point.

1.3. Part of plant harvested

The ripe fruit from the Kakadu Plum is harvested from trees greater than two meters high. The fruit is a small plum (1.5-2.5cm long), oval in shape (similar to an olive) and yellow-green in colour when ripe.

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

The Kakadu Plum is:

- Not listed as threatened under the NT *Territory Parks and Wildlife Conservation Act 2000*
- Not listed as threatened under the Federal *Environment Protection and Biodiversity Conservation Act 1999*.
- Not listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).

2. STATEMENT OF GENERAL GOAL/AIMS

The aims of this WTO proposal are to develop and maintain a small-scale sustainable supply-chain of 'selected' wild-harvested fruit for use in "Australian Made" value-added products for export to niche overseas cosmetic markets. Through careful management, monitoring, conservative harvest quotas and low-impact hand-harvesting techniques, the operation is considered to have negligible impact on the environment, ensuring the continued viability and sustainability of the natural resource.

3. HARVEST DETAILS

3.1. Harvest area and Land Tenure

The harvest area is described with the tenure reference of “Crown Lease Perpetual” and an owner category of “Private”. This portion is approximately 26,000 hectares, however the harvest area is only 20 hectares approx.

3.2. Permit requirements

A “Permit to Take Protected Wildlife” is required to harvest wildlife from Crown land and private land in N.T. pursuant to sections 56 and 57 of the *Territory Parks and Wildlife Conservation Act*, which is granted annually by PWCNT. The following permit will be renewed prior to the commencement of the harvest season in March:

Permit number	66362
Start date	1 March 2020
End date	14 January 2021
Permit holder	[REDACTED]
Street address of business	[REDACTED] Lambells Lagoon, Northern Territory
Scientific name	<i>Terminalia ferdinandiana</i>
Common name	Kakadu Plum
Royalty (per unit of measure)	\$ [REDACTED] per kg

The permit states the following details, terms, conditions and limitations to which the permit is subject:

- Maximum quantity of harvest / Unit of measure (25,000 kg)
- Method of harvest: e.g. hand harvest
- Harvesting of the fruit for commercial purposes only
- Vehicle(s) used for harvesting – Toyota Troop Carrier (CA41NO)
- Harvesting must be spread across the harvest area to avoid removal of all fruit in the local area.
- Within each hectare (100m x 100m area) the total harvested fruit must not exceed 20% of the available fruit, and a maximum harvest of 50% of the fruit from any one plant.

3.3. Harvest quantities & measurement

This application proposes the following maximum annual kilograms for export.

Scientific name	Harvest part	Maximum number of kilos per year
<i>Terminalia ferdinandiana</i>	Ripe fruit	4,000

3.4. Methods of harvesting

The ripe fruit is hand-harvested by a small team of collectors who move between trees on foot, careful not to cause damage to the natural environment. The harvesting is carried out by a casual workforce, ensuring a much-needed economic return for the local communities living in remote locations (Whitehead *et al.*, 2006, Cunningham *et al.* 2008). The team is managed by an experienced horticulturist. The hand-harvesting procedures involve picking ripe fruit accessible from ground level and gently shaking the tree to drop ripe fruit then collecting it from under the tree. Only healthy trees

are harvested, preferably in high density areas that exhibit high quantities of fruit. A maximum of 50% of each trees' fruit is harvested.

The harvested fruit is carried by hand in a container (e.g. basket) to the vehicle which is parked on the roadside. The permit holder must operate a legible log book noting the harvest quantities and harvest area to provide supporting evidence for the royalty's payable per unit (kg) and other reporting.

Key points related to hand harvesting:

- The hand-harvest operation must be within the limits of the PWCNT permit.
- Harvesting must be spread across the harvest area to avoid removal of all fruit in a local area.
- Within each hectare (100m x 100m area) the total fruit harvested from the species must not exceed 20% of the fruit present for that species, with a maximum harvest of 50% of the fruit from any one plant.
- Vehicles must remain on designated roads at all times.
- The aim is to harvest from trees with higher densities of fruit.
- Unhealthy trees are not harvested.
- The harvesting of the fruit must create minimal disturbance to foliage and branches.
- Under no circumstances should trees be removed or cut down.
- Clothing and boots worn by the harvester must be properly cleaned before visiting another harvest area.
- Where possible, the ripe fruit should be collected close to designated roads.
- Avoid walking near creeks or rivers as this may cause erosion to the banks.
- No rubbish of any kind is to be left in the area.
- The aim of the process is minimal disturbance to the local environment.
- Ensure the royalty is paid based on quantity collected.

The harvest of this fruit under the current permit system has been ongoing for over a decade for the domestic market and for the past six years under this export permit. To our knowledge, there are no incidences of harvesting physically damaging the Kakadu Plum fruit trees or other surrounding species, nor has any disease been introduced (including Myrtle Rust) to the environment as a direct result of these operations.

3.5. Harvest Period

The main harvest period is from the middle of the wet season to the early part of the dry season (January to June), but this can vary depending on the season. The fruit ripens at different rates throughout the season and is dependent on the climate, therefore harvest is an incremental seasonal process that typically takes place over a few consecutive months. It does not occur throughout the entire year.

4. IMPACT OF HARVEST ON THE TAXA AND THE RELEVANT ECOSYSTEM

The harvest of Kakadu Plum under current Northern Territory permit systems has been in operation for the domestic bushfood industry since 1996 (Sultanbawa & Sultanbawa). The annual fruit Take Permit (allowed to harvest) in the Northern Territory has ranged from 5,000kg in 1997 to 20,000kg in 2005 (Cunningham *et al.*, 2008).

Due to the stringent adherence to the licence conditions, including the annual audit procedures and a committed effort to protect the local environment on the part of the permit holder, there has been negligible impact on local ecosystems resulting from this operation.

5. MONITORING AND ASSESSMENT

5.1. Resource assessment

Kakadu Plum is not considered rare, threatened or endangered under State or Federal legislation, nor is it listed under the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The species occurs in open woodlands across Northern Australia, including Western Australia, Northern Territory and Queensland (Whitehead *et al.* 2006). In the Top End of Northern Territory, Kakadu Plum is a common understory tree in open woodlands dominated by *Eucalyptus teradonta* and *E. miniata* and occurs on a variety of soil types. Other understory trees include *Acacia* spp., *Syzygium suborbiculare*, *Planchonia careya*, *Erythrophleum chlorostachys*, *Buchanania obovata*, and *Xanthostemon paradoxus* (Woods, 1995).

A number of studies have reviewed the ecological sustainability of wild-harvested Kakadu Plum in Northern Australia (Woods, 1995, Gorman *et al.* 2006, Whitehead *et al.*, 2006, Sultanbawa & Sultanbawa, 2016). The density of Kakadu Plum is highly variable throughout its range and is dependent on soil types, climatic conditions and location (Whitehead *et al.*, 2006), with the highest densities occurring near the coast (Woods, 1995). Surveys conducted around the Darwin region reported mature, fruit-bearing trees >2 meters having a mean density of 272 stems ha⁻¹ whereas a more extensive survey in the coastal Arnhem Land region of Maningrida revealed a patchy distribution averaging 14.4 stems ha⁻¹ (Gorman *et al.*, 2006).

There is a paucity of research on the average yields of Kakadu Plum trees but Sultanbawa & Sultanbawa (2016) conservatively estimated the minimum yield to be 1500kg per hectare (based on 15 kg per tree (Woods 1995) and 100 trees per hectare). Whitehead *et al.* (2006) reported production to be in the tens of thousands of tonnes annually. Wild-harvesting operations are meeting the current commercial demand and there is little risk of over-harvest (Whitehead *et al.* 2006) but cultivation may be required to satisfy the growing market in the future (Sultanbawa & Sultanbawa, 2016).

The annual yields of Kakadu Plum at the Gunn Point harvest site are dependent on the climactic conditions and also impacted by foraging wild cockatoos (Pers. Comm. D. Boehme 22nd November 2017). In conjunction with wild-harvested fruit, the supplier/permit holder is establishing Kakadu Plum plantations on private land to supplement consumer demand and increase consistency of harvest (ABC News, *Tough Season for Kakadu Plum*. Accessed 29th November, 2017). Given the conservative estimates of densities and yields of Kakadu Plum across Northern Australia, the amount of product purchased by Southern Cross Botanicals and the methods used for harvesting, we believe the operation to be sustainable.

5.2. Supervision of harvesting

Our supplier/permit holder is an experienced horticulturalist and has been managing sustainable harvests under permit for over a decade. The primary harvest site on Crown land is supervised by local indigenous rangers and is monitored by the Parks and Wildlife Commission NT. The Permit must be presented to rangers upon request when harvesting plant material from Crown land. The permit holder must operate a legible logbook detailing the harvest quantities and harvest area to provide supporting evidence for the royalties payable per unit (kg) and for other reporting.

5.3. Monitoring of harvesting

The requirements of the permit ensure appropriate harvest practices to reduce negative impacts to the species and surrounding ecosystems. The supplier/permit holder is accountable to the issuer of the permit, the Northern Territory Parks and Wildlife Commission. The permit holder will thoroughly adhere to the conditions of the permit and oversee all harvesting operations to ensure the fruit are harvested in accordance with the permit conditions.

5.4. Other Monitoring

Southern Cross Botanicals visited the site on an annual basis for the entire duration of our last WTO. We are confident the supplier/permit holder is knowledgeable and ethical in their handling of harvest operations and the harvesting operations have negligible impact on the local ecosystems. As such, we believe no other monitoring is warranted.

6. MANAGEMENT STRATEGIES

The harvest team is managed by an experienced horticulturist with experience supervising production in the local region and adherence to permit conditions.

Harvest sites should be selected on the basis of high population densities, healthy trees and good access to established roads.

7. COMPLIANCE

The applicant will comply with all State and Federal laws for all actions associated with the operation outlined in this proposal.

8. REPORTS

The applicant will submit an annual report to the Department of Agriculture, Water and the Environment with details of material harvested for export and any other relevant details.

9. BACKGROUND INFORMATION

Kakadu Plum was a traditional food of Indigenous Australians (Cunningham *et al.* 2008). The fruit was first identified as having potential for the pharmaceutical, medical and nutrition industries in the 1980s (Sultanbawa & Sultanbawa 2016) when the high vitamin C content of the species captured attention for its commercial potential (Brand *et al.* 1982). Wild harvest only began in 1996 (Cunningham *et al.* 2008). Investment research was initiated from local and international companies into the agronomic potential of the species, but growth of the industry was slow (Sultanbawa & Sultanbawa 2016). However, the demand for Kakadu Plum has greatly increased since 2013 when research showed antimicrobial properties (Williams *et al.* 2014) and the fruit became popular as a novel food (Sultanbawa & Sultanbawa 2016). It is apparent that interest in this species for commercial interests has grown and will no doubt continue to expand as more and more uses are realised.

10. REFERENCES

- Brand, J.C, Cherikoff, V. and Lee, A. 1982. An Outstanding Food Source of Vitamin C. *Lancet* 2(8303):873
- Cunningham A. B., Garnett, S. Gorman, J. Courtenay, K. and Boehme, D., 2008. Eco-enterprises and Terminalia ferdinandiana: Best laid plans and Australian Policy lessons. *Economic Botany*, p1-13.
- Department of Land Resource Management, *Threatened Species List* <http://lrm.nt.gov.au/plants-and-animals/threatened-species/specieslist#.VEW4CcIcR9A>
- Environment Protection and Biodiversity Conservation Act 1999 - *Species Profile and Threats Database*, <http://www.environment.gov.au/cgi-bin/sprat/public/sprat.pl>
- Gorman, J. Griffiths, A. Whitehead, P. and Altman. J., 2002. *Trial commercial harvests of native plants by Aboriginal communities in the Top End of the Northern Territory: 2 Kakadu Plum*. Summary from RIRDC.
- Gorman J., Whitehead, P.J., Griffiths, A.D. 2006. An analysis of the use of plant products for commerce in remote aboriginal communities of northern Australia, *Journal of economic Botany* 60, 362-373.
- RIRDC, 2009. *Health Benefits of Australian Native Food – A evaluation of health-enhancing compounds*. Rural Industries Research & Development Corporation (RIRDC) publication.
- RIRDC, 2013. *Native Foods - R&D Priorities & Strategies 2013-2018*. Rural Industries Research & Development Corporation (RIRDC) publication.
- Sultanbawa, Y. and Sultanbawa, F. 2016. *Australian native plants: cultivation and uses in the health and food industries*. CRC Press, Taylor & Francis Group, Florida, USA.
- Whitehead, P.J., Gorman, J., Griffiths, A.D., Wightman, G., Massarella, H. and Altman, J. 2006. *Small-scale Commercial Plant Harvest by Indigenous Communities: A report for the Rural Industries Research & Development Corporation (RIRDC)/Land and Water Australia/FWPRDC/MDBC Joint Agroforestry Program* RIRDC, Barton, Australian Capital Territory, Australia.
- Williams, D.J., Edwards, D., Pun, S., Chaliha, M., Sultanbawa, Y. 2014. Profiling ellagic acid content: the importance of form and ascorbic acid levels. *Food Research International*. 66, 100-106
- Woods, B., 1995. *A study of the intra-specific variations and commercial potential of Terminalia ferdinandiana (The Kakadu Plum)*. Master Thesis, Northern Territory University.