



1. Application details

1.1. Permit application details

Permit application No.: 2194/1
Permit type: Purpose Permit

1.2. Proponent details

Proponent's name: Kimberley Environmental Solutions Pty Ltd

1.3. Property details

Property: WATER FEATURE (KUNUNURRA 6743)
UNALLOCATED CROWN LAND (KUNUNURRA 6743)
LOT 716 ON PLAN 217491 (KUNUNURRA 6743)
LOT 668 ON PLAN 217491 (KUNUNURRA 6743)
LOT 3004 ON PLAN 46759 (KUNUNURRA 6743)
KING LOCATION 715 (KUNUNURRA 6743)
ROAD RESERVE (KUNUNURRA 6743)
LOT 716 ON PLAN 217491 (KUNUNURRA 6743)
LOT 2370 ON PLAN 189289 (House No. 1 OLD DARWIN KUNUNURRA 6743)
LOT 2371 ON PLAN 189289 (KUNUNURRA 6743)
LOT 2466 ON PLAN 33378 (KUNUNURRA 6743)
ROAD RESERVE (KUNUNURRA 6743)
Local Government Area: Shire Of Wyndham-East Kimberley
Colloquial name:

1.4. Application

Clearing Area (ha)	No. Trees	Method of Clearing	For the purpose of:
15		Cutting	Miscellaneous
		Cutting	Miscellaneous
		Cutting	Miscellaneous

2. Site Information

2.1. Existing environment and information

2.1.1. Description of the native vegetation under application

Vegetation Description	Clearing Description	Vegetation Condition	Comment
Lily Creek Lagoon is a man made wetland where, due to constantly maintained water levels, native aquatic vegetation has become well established.	The proposal is for the purpose of controlling the spread of native aquatic vegetation within Lily Creek Lagoon. The proposed clearing will involve the cutting back to reduce the biomass levels of native vegetation that due to the ideal condition within the lagoon tend to overdominate. Typha will be excavated to 100mm above the roots and floating plants removed completely.	Very Good: Vegetation structure altered; obvious signs of disturbance (Keighery 1994)	The description of the vegetation under application was obtained from the application (KES, 2007) and aerial photography.
Aerial imagery of Lily Creek Lagoon shows extensive areas on the southern and western sides are intact and undisturbed.			
Native aquatic vegetation types found within the waterbody of Lake Kununurra include Typha domingensis (cumbungi) and Nymphaea spp., Ipomea aquatica.			

3. Assessment of application against clearing principles

(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.

Comments **Proposal is not likely to be at variance to this Principle**

The application is to harvest 15 hectares of native aquatic vegetation (predominately *Typha domingensis*) from Lily Creek Lagoon, a man made wetland (KES, 2007). Lily Creek Lagoon is classified a RAMSAR and ANCA wetland (DEWR, 2007). Native aquatic vegetation has become established in the lake as a result of stable water levels (maintained by the Department of Water). The current conditions within the lake are optimal for rapid establishment of *Typha*, with slow flowing, shallow water, warm temperatures and high nutrient levels (VMP, 2008, p34). *Typha* is a prolific seed producer and can colonise from both seeds and rhizomes. Harvesting during the cool dormant periods leads to less growth and recovery minimising *Typha* and other aquatic vegetation over colonisation of Lily Creek Lagoon (VMP, 2008)

The lake is recognised as having a high level of biological diversity and significant community value. Allowing *Typha* to become established in the lake would deleteriously affect the biodiversity of the wetland. Acknowledging this, a vegetation management plan has been put in place by the Shire of Wyndham East-Kimberley (SWEK), to better conserve the wetland. SWEK have highlighted areas of significant *Typha* colonisation for immediate and on-going removal in the plan (VMP, 2008). Therefore, the proponent has applied for a permit to remove *Typha* within the areas designated by SWEK shown in figure 12 and 13 of the Lake Kununurra and Lake Lily Creek Lagoon Vegetation Management Plan (2008).

Given the application area and purpose for clearing is in line with the conservation values of Lily Creek Lagoon and the Vegetation Management Plan (2008), the proposal is not likely to be at variance to this principle.

Methodology DEWR (2007)
KES (2007)
VMP (2008)
GIS Layers:
- Kununurra 50cm Orthomosaic
- RAMSAR, Wetlands
- ANCA, Wetlands

(b) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of, a significant habitat for fauna indigenous to Western Australia.

Comments **Proposal is not likely to be at variance to this Principle**

A desktop survey found two priority species occur within a 10km radius of Lake Kununurra and Lily Creek Lagoon:

- * Little Bittern (*Ixobrychus minutus*) - P4
- * Water-rat (*Hydromys chrysogaster*) - P4

The Little Bittern inhabits dense reeds and rushes bordering swamps, lakes and watercourses (Simpson & Day, 2004). The Water-rat is a nocturnal, territorial rodent preferring permanent fresh or brackish water, which forage close to the shoreline and nests in burrows in banks (Menkhorst & Knight, 2004). Both these species may occur within Lily Creek Lagoon. *Typha* 'provides cover, food, nesting places and habitat for water birds, aquatic insects, native fishes, freshwater invertebrates and frog etc' (VMP, 2008). The application is to cut *Typha* between 100mm-150mm above the roots and remove from the water (KES, 2007). The proponent intends to cut the vegetation in a patchwork pattern (cutting an area 100 metres by 100 metres and leaving an area of equal size undisturbed on each side of the cut area) in order to provide sanctuary for fauna such as those mentioned above. Furthermore, the proponent intends to keep a 3m buffer of vegetation around the entire shoreline unharvested (KES, 2007). This is in line with recommendations in the Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan (2008). The plan also states that an area of no less than 10 metres be left between harvested stands of *Typha* (VMP, 2008)

Given the above, it is unlikely that the application is at variance to this principle.

Methodology KES (2007);
VMP (2008);
Simpson & Day (2004)
Menkhorst & Knight (2004)
GIS Layers:
SAC Bio Datasets (090408) - Fauna

(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.

Comments **Proposal is not likely to be at variance to this Principle**

There are no known records of rare flora, but numerous occurrences of priority flora within a 10km radius of Lily Creek Lagoon. None were sighted within the Lily Creek Lagoon.

The proponent has committed to monitor and report any sightings of plants nominated by the Department of Environment and Conservation (DEC) and avoid disturbing the area surrounding these nominated plants (KES, 2007).

Given this, the removal of 15 hectares of native aquatic vegetation from Lily Creek Lagoon in order to control its range is not at variance to this principle.

Methodology KES (2007);
GIS Layer:
SAC Bio Datasets (100408) - WA Herbarium - Kimberley

(d) Native vegetation should not be cleared if it comprises the whole or a part of, or is necessary for the maintenance of a threatened ecological community.

Comments **Proposal is not likely to be at variance to this Principle**
There are no known threatened or priority ecological communities within a 10km radius of Lily Creek Lagoon.

Given this, the proposal is not likely to be at variance to this principle.

Methodology GIS Layers:
SAC Bio Datasets (100408) - Threatened Ecological Communities and - Priority Ecological Communities

(e) Native vegetation should not be cleared if it is significant as a remnant of native vegetation in an area that has been extensively cleared.

Comments **Proposal is not likely to be at variance to this Principle**
Aerial imagery of Lily Creek Lagoon shows extensive areas on the southern and western sides are intact and undisturbed.

Typha domingensis is a native aquatic plants which is currently not threatened and found all throughout Western Australia (WA Herb, 2008). The perimeter of Lily Creek Lagoon was over 75% Typha free in 1978, by 1993 though, almost the entire perimeter was colonised (Watkins 1997). Typha has become established throughout Lily Creek Lagoon due to the maintenance of stable water level conditions in the man made wetland (VMP, 2008).

The current extent of Typha within Lily Creek Lagoon is estimated at 71.43ha or 52.91% of the total Lily Creek Lagoon area. The proponent has applied to harvest 15ha of native aquatic vegetation which is approximately 20% of the total Typha colony. Harvesting as per the vegetation management plan, is recommended in lengths of no more than 100m and no stands of less than 10m in length be left in between the harvested areas (VMP, 2008). The proponent intends on leaving 100m between stands (KES, 2007). Furthermore, 'where floating areas of Cubungi occur, KES (the proponent) will remove the entire plants to within 3 metres of the shoreline' (KES, 2007).

Given the large population size of Typha within Lily Creek Lagoon, it is unlikely that the application to remove 15 hectares of native aquatic vegetation is likely to be at variance to this principle.

Methodology KES (2007)
VMP (2008)
WA Herb (2008)
Watkins (1997)
GIS Layer:
- Kununurra 50cm Orthomosaic
- Pre-European Vegetation - DA 01/01

(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.

Comments **Proposal is at variance to this Principle**
Lily Creek Lagoon is listed as a part of a Ramsar and ANCA wetland (DEWR, 2007). Allowing Typha and other native aquatic vegetation to become established and spread through the lagoon has the potential to affect the ecological character of the site and thus have a significant impact on the Ramsar values.

In stating this though, Typha plants strip nutrients from run off (VMP, 2008) which is an important process to help maintain the nutrient level within a wetland. Therefore, it is recommended that removal of Typha from around drains be avoided (VMP, 2008).

The application and purpose of the vegetation clearing is in line with the Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan (2008), and therefore it is unlikely that the application will have a detrimental impact on the natural values of the wetland. But as the application includes the removal of native vegetation growing in or in association with a wetland or watercourse the proposal is at variance to this principle.

Methodology DEWR (2007);
KES (2007);
VMP (2008);
GIS Layers:
- ANCA Wetland
Hydrography, linear
- RAMSAR, Wetlands - CALM 14/02/03

(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.

Comments Proposal is not likely to be at variance to this Principle

Typha stands stabilise banks and prevent erosion by aiding in sediment control (VMP, 2008). The maintenance of Typha stands around the shore line reduce erosion. Given this, the proponent intends to keep a 3m buffer of vegetation around the entire shoreline unharvested (KES, 2007). This is in line with recommendations in the Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan (2008).

The proponent has stated that the method of removal will involve leaving the roots and stem to 100mm in the lagoon bed (KES, 2007), therefore bed disturbance will not be an issue.

Given the above, the proposal is not likely to cause or exacerbate appreciable land degradation.

Methodology KES (2007)
VMP (2008)

(h) Native vegetation should not be cleared if the clearing of the vegetation is likely to have an impact on the environmental values of any adjacent or nearby conservation area.

Comments Proposal is not likely to be at variance to this Principle

Mirima National Park is adjacent to the Lily Creek Lagoon near the town of Kununurra. The park is located upstream of the Lagoon, and will not be affected by any vegetation removal activities within the lake.

Lily Creek Lagoon is a Ramsar and ANCA wetland. The establishment and spread of Typha and other native aquatic vegetation in the Lagoon has the potential to over run the wetland and reduce the vegetation biodiversity. Allowing Typha to become established in the lake would negatively impact on the conservation values of the Lagoon. The Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan (2008) states that the area within Figure 12 of the plan which is 7.6% of the total area currently colonised by cumbungi, is recommended for immediate and ongoing removal. The plan goes on to state that 'Kimberley Environmental Solutions has expressed interest in providing a service by contract to harvest cumbungi and other aquatic weeds...such a commercial venture would be welcomed' (VMP, 2008).

Harvesting of Typha is the method most preferred, as it has the least physical impact and does not add chemical residue or decomposing biomass to the water (VMP, 2008)

There is an existing protection buffer as agreed upon by the Department of Water (DoW) and the Shire of Wyndham East-Kimberley on the shoreline of Reserve 41812 (Lease area). Kimberley Environmental Solution have committed to conserving existing buffers and their procedures allow for re-growth of cut areas effectively providing a continuous buffer (KES, 2007). If the permit is granted, Kimberley Environmental Solutions should liaise with the shire and DoW to ensure that protection buffer zones are not impinged on by harvesting works.

The removal of 15 hectares of native aquatic vegetation from Lily Creek Lagoon in order to control Typha is unlikely to have a detrimental impact on the Ramsar and ANCA values of the Lagoon and surrounding conservation areas.

Methodology KES (2007)
GIS Layers:
- CALM Managed Lands and Waters - CALM 1/07/05
- RAMSAR, Wetlands - CALM 14/02/03
- ANCA Wetlands

(i) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause deterioration in the quality of surface or underground water.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing will occur within the water body of Lily Creek Lagoon. The establishment and spread of Typha in the Lagoon has the potential to over run the wetland and reduce the vegetation biodiversity. By harvesting the conservation levels are likely to be maintained.

The Public Drinking Water Source area (PDWSA), consisting of a P1 protection zone, is located adjacent to the

4. Assessor's comments

Comment

The proposal was found to be at variance to principle (f) and not likely to be at variance to all other principles.

5. References

- DEWR, 2007. Commonwealth Department of Environment and Water Resources. Sited at www.dewr.gov.au
- DoE, 2003. Department of Environment Kununurra Water Reserve - Drinking Water Source Protection Plan. Kununurra Town Water Supply. Water Resource Protection Series No WRP 51.
- EPA (2000) Environmental protection of native vegetation in Western Australia. Clearing of native vegetation, with particular reference to the agricultural area. Position Statement No. 2. December 2000. Environmental Protection Authority.
- Keighery, B.J. (1994) Bushland Plant Survey: A Guide to Plant Community Survey for the Community. Wildflower Society of WA (Inc). Nedlands, Western Australia.
- KES, 2007. Application for permit to Harvest Flora from Lily Creek Lagoon for Commercial Purposes. Kimberley Environmental Solutions Pty Ltd. November 2007
- Menkhorst, P. and Knight, F. 2004. A Field Guide to the Mammals of Australia. 2nd Edition. Oxford University Press.
- Shepherd, D.P., Beeston, G.R. and Hopkins, A.J.M. (2001) Native Vegetation in Western Australia, Extent, Type and Status. Resource Management Technical Report 249. Department of Agriculture, Western Australia.
- Simpson, K. and Day, N. 2004. Field Guide to the Birds of Australia. 7th Edition. Penguin Books Ltd.
- VMP, 2008. Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan 2008. Kununurra TAFE and Shire of Wyndham East Kimberley. January 2008
- Watkins, D., et al, 1997. Management Planning for Ramsar Sites in the Kimberley Region of Western Australia, Department of Conservation and Land management, WA.

6. Glossary

Term	Meaning
BCS	Biodiversity Coordination Section of DEC
CALM	Department of Conservation and Land Management (now BCS)
DAFWA	Department of Agriculture and Food
DEC	Department of Environment and Conservation
DEP	Department of Environmental Protection (now DEC)
DoE	Department of Environment
DoIR	Department of Industry and Resources
DRF	Declared Rare Flora
EPP	Environmental Protection Policy
GIS	Geographical Information System
ha	Hectare (10,000 square metres)
TEC	Threatened Ecological Community
WRC	Water and Rivers Commission (now DEC)

area where the clearing is proposed. However, the direction of groundwater flow into the PDWSA is from Lake Kununurra in the south, moving northwards (DoE, 2003), therefore the proposed clearing will be 'downstream' of the PDWSA and is not likely to impact upon the quality of the groundwater.

Uncontrolled Typha stands may detrimentally impact on the water quality of Lily Creek Lagoon by restricting or blocking water flow and outcompeting weeds, subsequently leading to decaying vegetation (VMP, 2008). The proponent has completed tests which have shown that water quality does not change when harvesting is carried out in the manner prescribed (KES, 2007). The proponent goes on to state that 'turbidity will be avoided by cutting the plants above the roots and leaving the lower fronds of the plant intact. Eutrophication of the waterbody will be eliminated by removing all harvested plant matter from the water on the day it is cut' (KES, 2007).

The removal of 15 hectares of native aquatic vegetation to control Typha levels in Lily Creek Lagoon, in accordance with the Lake Kununurra and Lily Creek Lagoon Vegetation Management Plan, is not likely to change the quality of surface or ground water.

Methodology KES (2007)
VMP (2008)
DoE (2003)
GIS Layers:
- Hydrography, linear - DOE 1/2/04
- Public Drinking Water Source Areas (PDWSAs) - DOW

(j) Native vegetation should not be cleared if clearing the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.

Comments Proposal is not likely to be at variance to this Principle

The proposed clearing will occur within the water body of Lily Creek Lagoon. The purpose of the application is for the harvesting of 15ha of native vegetation (predominately Typha). Currently, Lily Creek Lagoon is estimated at containing 71.43ha of Typha (VMP, 2008). The application involves the removal of the Typha shoots only, from 100mm above the roots (KES, 2007), this will minimise the increase in water level.

Additionally, the water levels of the lake are regulated and managed by the Water Corporation (VMP, 2008). Such regulation of the water flow in and out of the lagoon ensures that flooding is minimal.

The proposed removal of 15 hectares of Typha is not likely to influence the incidence or intensity of any flooding in Lily Creek Lagoon.

Methodology KES (2007)
VMP (2008)
GIS Layers:
- Rainfall, Mean Annual - BOM 30/09/01
- Hydrography, linear - DOE 1/2/04

Planning instrument, Native Title, Previous EPA decision or other matter.

Comments

Much of the lake is Unallocated Crown Land for which the Department of Planning and Infrastructure (DPI) has responsibility. The Department has allowed Kimberley Environmental Solutions (KES) access to DPI lots (DEC TRIM Ref: DOC42527).

The Department of Water is the co-vestee of Reserve 41812, in conjunction with the Shire of Wyndham-East Kimberley, surrounding much of Lake Kununurra. The Department has shown support for this work and allowed access to the lot (TRIM REF: DOC41371).

A submission was received by the Shire of Wyndham East-Kimberley. The shire supports the application (DEC TRIM Ref: DOC43270).

There are sites of Aboriginal significance within the area proposed to clear. It is the proponent's responsibility to comply with the Aboriginal Heritage Act 1972 and ensure that no Aboriginal Sites of Significance are damaged through the clearing process.

Methodology DEC TRIM Ref: DOC42527
DEC TRIM REF: DOC41371
DEC TRIM Ref: DOC43270
GIS Layers:
- Native Title Claims - DLI
- Aboriginal Sites of Significance - DIA
- Environmental Impact Assessments