



Memorandum

6 February 2019

To	Gemma Tribbick (Water Corporation)		
Copy to			
From	Erin Lynch	Tel	+61 8 6222 8316
Subject	Assessment against the Ten Clearing Principles	Job no.	6135763

Introduction and background

The Water Corporation proposes to construct new infrastructure to improve the supply of water to the towns of Balingup, Mullalyup and Kirup, and as a component of the broader Warren Blackwood Water Supply Scheme (the project).

The project area consists of two distinct areas (pipeline corridor and the Kirup dam bypass) located between the towns of Kirup and Greenbushes, and has a total area of 15.3 hectares (ha). Of this, 5.8 ha is native vegetation. The remaining area (9.5 ha) is predominantly cleared or highly degraded and contains introduced/planted species. When preparing a native vegetation clearing application an assessment of the project area against the Ten Clearing Principles should be undertaken to inform this process. The Ten Clearing Principles aim to ensure that potential impacts resulting from removal of native vegetation can be assessed in an integrated way.

Outcome of assessment

An assessment of the proposed native vegetation clearing within the project area against the Ten Clearing Principles was undertaken (Attachment 1). This assessment concluded the proposed clearing associated with the project is likely to be at variance to principles (b) and (f). The project is considered unlikely to be at variance to the remaining principles.

Principle (b) states "*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*".

There is no habitat within the project area that would be considered specific to or solely relied upon by any of the conservation significant species known or likely to occur within the area; however, it may form part of a significant habitat for black cockatoos. None of the black cockatoo habitat trees recorded in the project area had evidence of use for breeding or roosting. Given the relatively small area to be cleared and the long, linear nature of the project area, the extent of suitable habitat within the immediate vicinity and existing disturbances within the project area, it is unlikely that the proposed clearing would have a significant impact upon conservation significant fauna known to occur in the area.

Principle (f) states "*Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland*". The project area supports vegetation growing in association with a watercourse, including *Eucalyptus rudis*, and the removal of this vegetation is likely to be at variance to this principle. However, given the relatively small amount of clearing required of this vegetation and its location adjacent to an existing track, it is considered the impact of its loss is unlikely to be significant.

Limitations

This memorandum has been prepared by GHD for the Water Corporation and may only be used and relied on by the Water Corporation for the purpose agreed between GHD and the Water Corporation. GHD otherwise disclaims responsibility to any person other than the Water Corporation arising in connection with this report. GHD also excludes implied warranties and conditions, to the extent legally permissible.

GHD considered the results of the technical studies completed as part of broader commission, in addition to other relevant technical studies supplied by the Water Corporation, to identify potential project impacts on clearing of native vegetation. The assessment against the Ten Clearing Principles was undertaken for the project as a whole to determine the significance of the impacts. The limitations and assumptions outlined in the biological assessment report (GHD 2017a and GHD 2018) also apply to this letter.

Regards

A handwritten signature in blue ink, appearing to read 'Erin Lynch', is positioned below the 'Regards' text.

Erin Lynch

Ecologist

References

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Shepherd, DP, Beeston, GR, and Hopkins, AJM 2002, *Native Vegetation in Western Australia – Extent, Type and Status*, Resource Management Technical Report 249, Department of Agriculture, Western Australia

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Attachment 1 Assessment against the ten clearing principles

Principle	Assessment	Outcome	References
(a) Native vegetation should not be cleared if it comprises a high level of biological diversity.	<p>The project area is 15.3 ha, of which 5.8 ha is remnant native vegetation. The remaining area (9.5 ha) has previously been cleared. The proposed clearing will be predominantly within a narrow strip of vegetation extending along the majority of the project area, which is adjacent to existing roads/tracks. The total length of the project area is approximately 16 km, with an average width of less than 10 m (including previously cleared areas).</p> <p>The project area is situated in the South West Botanical Province of Western Australia, within the Jarrah Forest Interim Biogeographical Regionalisation for Australia (IBRA) bioregion and the Southern Jarrah Forest subregion. The project area included sections of Department of Biodiversity, Conservation and Attractions (DBCA) managed land and roadside vegetation. Five remnant vegetation types were mapped by Astron (2013), six mapped by GHD (2017a) and four mapped by GHD (2018) within the project area. These vegetation types were similar to each other with small variations in mid and lower storey species dominance. The vegetation types consisted of Eucalyptus woodlands (variations of jarrah-marri woodlands, marri woodland, jarrah-marri-blackbutt woodlands and marri-flooded gum woodlands) and are typical of those found in the jarrah forest region. Other areas mapped within the project area consisted of planted (introduced) vegetation or cleared areas.</p> <p>The vegetation condition within the project area ranged from Very Good to Completely Degraded condition, with the majority of the project area in Degraded to Completely Degraded condition (Astron 2013, GHD 2017a and GHD 2018).</p> <p>No significant, threatened or restricted vegetation types were identified within the project area. The project area is linear and does not contain areas of native vegetation that are in better condition, or of a higher floristic value, than the surrounding vegetation. Desktop searches and field surveys did not identify</p>	The proposed clearing is unlikely to be at variance to this principle.	<p>GHD (2018)</p> <p>GHD (2017a)</p> <p>Astron (2013)</p>

Principle	Assessment	Outcome	References
	<p>any Threatened Ecological Communities (TECs) or Priority Ecological Communities as defined by the EPBC Act and DBCA (DPaW 2016, DBCA 2017).</p> <p>Astron (2013) recorded 206 flora taxa (28 introduced) representing 128 genera from 48 families from their survey area. GHD (2017a) recorded 106 flora taxa (including subspecies and varieties) representing 40 families and 74 genera during the survey. GHD (2018) recorded a total of 61 flora taxa representing 23 families and 51 genera. Of these 37 were introduced (weed) species. No EPBC Act or WC Act listed flora were recorded within the project area during the surveys. In addition, no DBCA Priority-listed flora or flora of conservation significance were recorded (Astron 2013, GHD 2017a, GHD 2018). This level of diversity is representative of a comprehensive survey undertaken during spring and autumn conditions with a good suite of orchids and other ephemeral taxa recorded. The flora recorded during the surveys are typical of the southern jarrah forest.</p> <p>The project area contains 5.8 ha of suitable habitat for conservation significant fauna. Of this, approximately 2.2 ha is in Good or better condition. Astron (2013) recorded 34 fauna species during the fauna assessment: three amphibian, 28 bird and three mammal species. Four of these are listed under State and Federal legislation and have conservation significance: Baudin's Black Cockatoo, Forest Red-tailed Black Cockatoo, Eastern Great Egret and Quenda. GHD (2017a) recorded 46 fauna species during the survey, including 33 birds, nine mammals, and four amphibians. Eight of these species are introduced. Three conservation significant fauna were recorded by GHD (2017a): Carnaby's Black Cockatoo, Forest Red-tailed Black Cockatoo and Baudin's Black Cockatoo. GHD (2018) recorded 28 fauna species of which four are introduced. The Forest Red-tailed Black Cockatoo was observed foraging in the survey area and foraging evidence on marri nuts from Carnaby's Black Cockatoo was also observed during the survey by GHD (2018).</p>		

Principle	Assessment	Outcome	References
	<p>Given the linear nature of the project and history of disturbances within the corridor due to clearing and edge effects (both within and adjacent to the corridor), the project area is not likely to comprise a greater diversity than similar areas either locally or at a bioregional scale. Clearing for the project is not likely to be at variance to this Principle.</p>		
<p>(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.</p>	<p>Four broad fauna habitat types have been identified across the project area: mixed Eucalypt woodlands (jarrah/marri/blackbutt), creeklines and minor drainage lines with flooded gum (<i>E. rudis</i>) woodland, planted/introduced vegetation and cleared areas. The majority of the habitat types within the project area are well-connected at both a local and regional scale to other areas of remnant and contiguous vegetation. However given the majority of the clearing is likely to occur adjacent to existing roads/tracks, it is not expected to create new barriers or significant exacerbate existing barriers, particularly given the relatively narrow width of the corridor.</p> <p>Fauna surveys undertaken in the project area identified the presence of five fauna species of conservation significance: Carnaby's Black Cockatoo (Endangered), Baudin's Black Cockatoo (Vulnerable), Forest Red-tailed Black Cockatoo (Vulnerable), Eastern Great Egret (Migratory) and Quenda (Priority 4) (Astron 2013, GHD 2017a, GHD 2018). An additional ten conservation significant fauna were identified as likely to occur in the project area based on previous records and suitability of habitat.</p> <p>The vegetation within the project area was identified as suitable foraging habitat and potential breeding and roosting habitat for the three threatened species of Black Cockatoo. All three species were recorded within the project area.</p> <p>Seven hundred and sixty three potential habitat trees were identified within the larger survey areas by Astron (2013) and GHD (2017a,b) and GHD (2018) (some records were located just outside of the survey areas). The project area has since</p>	<p>The proposed clearing is likely to be at variance to this principle.</p>	<p>GHD (2018) GHD (2017a,b) Astron (2013)</p>

Principle	Assessment	Outcome	References
	<p>been refined to reduce the amount of clearing required and in particular retain as many potential black cockatoo habitat trees as possible. As a result, a total of 91 potentially Black Cockatoo breeding trees (Jarrah, Marri, Blackbutt and Flooded Gum) are located within the project area. Of these, 15 are hollow-bearing, although none of these trees had evidence of current or previous Black Cockatoo use (i.e. old chew marks). Of the 91 trees within the project area, 64 trees will be cleared for the project, avoiding a total of 27 trees. Old and fresh Black Cockatoo foraging evidence was recorded scattered throughout the project area (on Marri nuts) and there is 5.8 ha of suitable foraging habitat.</p> <p>The majority of the habitats recorded in the project area are well represented in the immediate vicinity of the project area and in the broader Blackwood district (particularly in the conservation areas and State Forest) and would be utilised by all the conservation significant species known or likely to occur in the area. Furthermore, there is no habitat within the survey area that would be considered specific to or solely relied upon by any of the conservation significant species known or likely to occur within the area. Given the relatively small area to be cleared, the thin linear nature of the project area, the extent of suitable habitat within the immediate vicinity and the existing disturbances within the project area, it is unlikely the proposed clearing represents a core habitat for any of the conservation significant fauna identified as present or likely to occur. The proposed clearing is not expected to have a significant impact upon these fauna species of conservation significance.</p>		
<p>(c) Native vegetation should not be cleared if it includes, or is necessary for the continued existence of, rare flora.</p>	<p>The flora and vegetation surveys undertaken within the project area did not record any threatened flora listed under the WC Act or EPBC Act.</p> <p>Desktop searches identified the presence/potential presence of 24 EPBC Act and/or WC Act listed flora taxa within a 20 km radius of the project area (Astron 2013, GHD 2017a, 2018). A likelihood of occurrence assessment was completed for the Threatened flora taxa identified in desktop searches. This</p>	<p>The proposed clearing is unlikely to be at variance to this principle.</p>	<p>DotEE (2018) DBCA (2007–) GHD (2018) GHD (2017a) Astron (2013)</p>

Principle	Assessment	Outcome	References
	<p>assessment determined that no Threatened taxa were likely to or may possibly occur within the project area.</p> <p>Given the survey effort and season coverage (spring and autumn survey), if populations of Threatened flora taxa were present it is expected they would have been identified in the field.</p>		
(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.	<p>Searches of the EPBC Act Protected Matters Search Tool and DBCA TEC database did not identify any TEC within 10 km of the project area. GHD (2017a, 2018) and Astron (2013) did not identify any TECs during the vegetation surveys.</p>	<p>The proposed clearing is not at variance to this principle.</p>	<p>DotEE (2018) GHD (2018) GHD (2017a) Astron (2013)</p>
(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.	<p>The project area is linear and covers approximately 15.3 ha, of which 5.8 ha is native vegetation. To minimise the impact of the pipeline construction the Water Corporation intends to use existing tracks and cleared/ degraded areas where possible. The vegetation condition within the project area ranged from Very Good to Completely Degraded condition, with the majority (65%) of the project area in Degraded to Completely Degraded condition (Astron 2013, GHD 2017a, GHD 2018).</p> <p>The project area is in the Jarrah Forest IBRA bioregion, the Southern Jarrah Forest Subregion and the Shires of Bridgetown-Greenbushes and Donnybrook-Balingup. Broad scale mapping by Smith (1974) indicates one vegetation association — Medium forest; jarrah-marri (association 3). Seven vegetation complexes were mapped by Matiske and Havel (1998): Balingup (BL), Balingup (BLf), Catterick (CC1), Dwellingup (D1), Kirup (KR), Mumballup (ML), and Queenwood (QW).</p> <p>The Smith (1974) pre-European mapping has been adapted and digitised by Shepherd <i>et al.</i> (2002). The extent of the vegetation</p>	<p>The proposed clearing is unlikely to be at variance to this principles.</p>	<p>Smith (1974) Matiske and Havel (1998) GHD (2018) GHD (2017a) Astron (2013) Shepherd et al. (2002) GoWA (2018) Molloy et al. (2007)</p>

Principle	Assessment	Outcome	References
	<p>associations has been determined by the state-wide vegetation remaining extent calculations maintained by the DBCA (latest update December 2017; GoWA 2018). The current extent of vegetation association 3 is greater than 50% of its pre-European extent at all levels (State, IBRA bioregion, IBRA subregion and LGA).</p> <p>GoWA has assessed the vegetation complexes described by Matiske and Havel against presumed pre-European extents for the south west forest region of WA and the Shires of Bridgetown-Greenbushes and Donnybrook-Balingup.</p> <p>Three of the vegetation complexes (Balingup BL Balingup BLfand Mumballup) have less than 30% of their pre-European extents remaining (29%, 9.2% and 13.08%, respectively). The mapped area of the Mumballup complex does not contain any remnant vegetation within the project area. No impact to this complex is proposed. The project area does traverse through some remnant vegetation mapped as the Balingup BL and BLf complexes which have been assessed by GHD (2018) to be in degraded condition. The alignment will be confined within previously cleared areas (such as fire breaks, road verge and other tracks) and will require very minimal clearing of native vegetation. No significant impacts to these complexes are considered likely. The remaining four complexes have greater than 30% of their pre-European extents remaining in the south west forest region of WA.</p>		
(f) Native vegetation should not be cleared if it is growing in, or in association with, an environment associated with a watercourse or wetland.	<p>There are no regionally significant wetlands or watercourses with permanent water within the project area.</p> <p>The alignment intersects three creeks – Spring Creek, Balingup Brook and Mullalyup Brook – and a few minor drainage lines. Of these water courses only one was still vegetated with native vegetation (Spring Creek – Very Good condition), which was identified as marri-jarrah-flooded gum (<i>Eucalyptus rudis</i>) woodland. There may be a small amount of riparian vegetation</p>	The proposed clearing is likely to be at variance to this principle.	GHD (2018) GHD (2017a) Astron (2013)

Principle	Assessment	Outcome	References
	<p>clearing required however the pipeline will be designed along the existing track crossing at Spring Creek, where possible.</p> <p>Due to the linear nature of the construction footprint, the existence of vehicle tracks at the locality and the limited clearing required, the impact to the riparian vegetation is unlikely to be significant.</p>		
(g) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause appreciable land degradation.	<p>The project area consists of moderate to hilly relief with elevation rising from around 160 to 260 m AHD. Most of the project area follows existing tracks, roads and cleared or highly disturbed areas, which are unlikely to be further degraded by project activities.</p> <p>Groundwater salinity levels are classified as low and are mapped as 500 to 1000 mg/L of total dissolved solids.</p> <p>The project area is mapped as having an 'Extremely low probability of occurrence' of acid sulfate soils (ASRIS 2017).</p> <p>Given the small area (5.8 ha is native vegetation) and thin linear nature (approximately 16 km long with an average width of less than 10 m including previously cleared areas) of the proposed clearing, the project is not likely to cause appreciable land degradation either from wind erosion, changes to soil properties or chemistry, nor likely to have an impact on adjacent vegetation.</p>	The proposed clearing is unlikely to be at variance to this principle.	<p>GHD (2018)</p> <p>GHD (2017a)</p> <p>Astron (2013)</p> <p>ASRIS (2017)</p>
(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.	<p>There are seven DBCA managed lands that overlap with the project area: Greenbushes State Forest (F 20), CALM Exec Body Freehold (name 1042/47) (P229098 2298), CALM Exec Body Freehold (name 117/388) (P252367 6367), CALM Exec Freehold (name: 1489/474) (P102432 090), CALM Exec Freehold (name: 1489/474) (P102431 908), CALM Exec Freehold (name: 1371/170) (P301590 200) and Mullalyup State Forest (F 21). The two State forests are managed for timber production and recreational uses.</p> <p>The width of the project area is on average up to 10 m mostly follows cleared tracks, roads or highly disturbed areas with</p>	The proposed clearing is unlikely to be at variance to this principle.	GoWA (2017)

Principle	Assessment	Outcome	References
	<p>proposed clearing to occur adjacent to or within these previously cleared/disturbed areas. Therefore any disturbance to the surrounding environment should be minimal with no significant impacts to the environmental values of the State forest expected.</p>		
<p>(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.</p>	<p>There are no regionally significant wetlands or watercourses with permanent water within the project area. The project area intersects the Dumpling Gully Surface Water Area and Mullalyup Surface Water Area as proclaimed under the <i>Rights in Water and Irrigation Act 1914</i>. The project area also occurs within two Public Drinking Water Source Areas: the Mullalyup Water Reserve and the Greenbushes Catchment Area.</p> <p>The project area intersects three creeks (Mullulyup Brook, Balingup Brook and Spring Creek) and a few minor drainage lines. Of these watercourses, only Spring Creek was still vegetated with native vegetation when surveyed (Astron 2013, GHD 2017a).</p> <p>The project will not change the hydrology of the area. As no surface water will be taken for this project and due to the minor nature of the works, it is unlikely there will be a significant impact to the surface water quality of this area. Given the small scale of clearing and that no water extraction, dewatering or drainage modifications are required, it is considered there will be very little to no deterioration of underground water quality.</p>	<p>The proposed clearing is unlikely to be at variance to this principle.</p>	<p>GHD (2018) GHD (2017a) Astron (2013) DWER (2017)</p>
<p>(j) Native vegetation should not be cleared if the clearing of the vegetation is likely to cause, or exacerbate, the incidence or intensity of flooding.</p>	<p>A large proportion of the alignment follows pre-existing tracks, roads and previously cleared land. There are some low-lying areas present within the project area but the minimal amount of clearing required for the project would have no significant impact on the natural surface and groundwater processes. The proposal is not likely to cause, or exacerbate, the incidence or intensity of flooding.</p>	<p>The proposed clearing is unlikely to be at variance to this principle.</p>	<p>Astron (2013) GHD (2018) GHD (2017a) BoM (2017)</p>