

10 July 2025

**Re: VALHALLA GAS EXPLORATION AND APPRAISAL PROGRAM (EPBC 2024/10006) DCCEEW RFI  
DESKTOP ASSESSMENT**

Please find below a memo summarising *ecologia* Environment's (*ecologia*) response to the Department of Climate Change, Energy, the Environment and Water (DCCEEW) comments requesting additional information for the Largetooth Sawfish (*Pristis pristis*) on the Valhalla Exploration and Gas program.

**Background**

Bennett Resources Pty Ltd (BNR) is proposing to undertake the Valhalla Gas Exploration and Appraisal Program (the Project) located approximately 51 km northwest of the townsite of Fitzroy Crossing (Shire of Derby-West Kimberley) in WA. *ecologia* was commissioned by Bennett Resources in 2024 to undertake a targeted fauna survey of the Project Area to identify the presence of any Threatened or Priority fauna, with focus on assessment of the greater bilby, ghost bat and northern quoll. BNR have since referred the project under the EPBC Act utilising both the baseline Eco Logical Survey Report and the *ecologia* Targeted Survey (Greater bilby/Northern Quoll and ghost bat) (2024). The Department of Climate Change, Energy, the Environment and Water (DCCEEW) has determined the proposal to be a controlled action on Matter of National Environmental Significance (MNES) which will be assessed by preliminary documentation. This requires BNR to respond to a Request for Information (RFI) requested by DCCEEW.

**Table 1: Responses to RFI in relation to the Largetooth Sawfish (*Pristis pristis*)**

<p><b>i) Information on the abundance, distribution, ecology and habitat preferences for each listed and migratory species.</b></p>	<p>Largetooth Sawfish (<i>Pristis pristis</i>) are distributed across freshwater rivers, estuarine systems, and marine environments, occurring up to 100 km offshore in Australia (DCCEEW 2014; Kyne, Carlson &amp; Smith 2019). Globally, four genetically distinct subpopulations exist, occupying circumtropical waters, including the eastern and western Atlantic, eastern Pacific, and Indo–West Pacific Oceans (DCCEEW 2014; Kyne, Carlson &amp; Smith 2019).</p> <p>The Indo–West Pacific subpopulation has experienced significant declines throughout its range. However, northern Australia remains one of the few regions where viable populations persist (Morgan et al., 2011). In contrast, data on populations in other parts of the Indo–West Pacific—such as South Africa, Mozambique, and other Indian Ocean-bordering countries—are limited, although localized depletions have been documented (DCCEEW 2014; Kyne, Carlson &amp; Smith 2019). In Australia, <i>P. pristis</i> inhabits multiple drainage systems across the northern half of the continent. In Western Australia, key catchments include the King Sound, Fitzroy, Durack, Robinson, and Ord River systems, which represent important nursery habitats. <i>Pristis pristis</i> are born in estuarine river mouths and migrate upstream, travelling up to 400 km inland (Thorburn 2006; DCCEEW 2014; Kyne, Carlson &amp; Smith 2019). Juveniles inhabit freshwater pools, often in isolated reaches, and return to marine environments upon reaching maturity.</p>
<p><b>ii) Quantification of the extent of habitat and the number of individuals likely to be impacted, or historical patterns of use by those species, within the proposed action area and surrounds (including mapping identifying known and/or potential habitat).</b></p>	<p>Analysis using the Normalized Difference Water Index (NDWI) indicates variable surface water availability within the creek intersecting the project footprint. Imagery captured on 24 January 2025 using Sentinel-2 satellite data indicates that approximately 6,190 m<sup>2</sup> of surface water was present within the development envelope in Mount Hardman Creek and 0m<sup>2</sup> within any impact areas (Figure 1). In contrast, imagery from 9 September 2024 (the previous dry season) detected 0 m<sup>2</sup> of surface water in the same area, suggesting that the creek does not retain permanent pools year-round and instead provides only ephemeral aquatic habitat. Further analysis of imagery captured in May 2025 also showed 0 m<sup>2</sup> of surface water within Mount Hardman Creek in the development envelope.</p> <p>Additionally, targeted flora surveys were conducted by both Eco Logical Australia (March 2021) and Ecologia (July 2024) on behalf of Bennett Resources Pty Ltd., within the same</p>

	<p>development envelope, which is in the proximity of Mt Hardman Creek. Although aquatic fauna was not being sampled, survey methods including habitat descriptions did not indicate nearby surface water, indicating the ephemeral nature of the creek line. (Eco Logical Australia, 2021; Ecologia 2024).</p> <p>Based on the absence of permanent aquatic habitat and the lack of historical records of <i>Pristis pristis</i> in the area, the number of individuals likely to be impacted by the proposed action is negligible.</p>
<p><b>iii) Assessment of the quality and importance of known or potential habitat for the relevant listed species and migratory species, within the proposed action area and surrounds.</b></p>	<p>Habitat quality within the proposed action area is constrained by a lack of permanent water. NDWI analysis indicates that Mount Hardman Creek section within the development envelope does not retain water during the dry season. Specifically, in September 2024, no surface water was detected, indicating the absence of persistent aquatic habitat during the dry season. During the wet season (January 24th, 2025), NDWI analysis identified approximately 6,190 m<sup>2</sup> of surface water within the impact area. However, the depth, duration, and ecological suitability of this surface water as habitat for <i>Pristis pristis</i> remain unknown.</p> <p>Given the ephemeral nature of surface water and absence of year-round aquatic refuge, the area is considered to provide low-quality, temporary habitat for <i>Pristis pristis</i>. The nearest known high-quality and permanent aquatic habitat is in the Fitzroy River system located outside the immediate project footprint.</p> <p>Large flooding events may temporarily increase hydrological connectivity between the Fitzroy River and upstream tributaries such as Mt Hardman Creek, potentially allowing limited movement of aquatic species into otherwise disconnected areas. However, such conditions are typically short-lived often lasting only a few days.</p> <p>These ephemeral flooding events may enable transient movement of <i>P. pristis</i> into upstream areas; however, the likelihood of sustained use is extremely low. Upstream habitats such as Mt Hardman Creek are generally shallow, intermittently connected, and subject to disturbance, reducing their suitability for foraging, refuge, or movement. Even under optimal seasonal conditions, the potential for <i>P. pristis</i> to occur or establish within the development</p>

	<p>remains minimal. Therefore, while the species is capable of utilising connected systems during flood events, the habitat present does not constitute high-quality or critical habitat for the species' ongoing survival or recovery.</p> <p>In summary, the action area and its surrounds are unlikely to represent critical or high-value habitat for <i>Pristis pristis</i>, particularly given the absence of historical records and limited hydrological suitability.</p>
<p><b>iv) Information detailing known populations or records of individuals within at least 2 km of the proposed action area and the size of these populations, if available.</b></p>	<p>Database searches including the Dandjoo biodiversity database and the Atlas of Living Australia (ALA) revealed no records of <i>Pristis pristis</i> within 2 km of the proposed action area. A review of relevant scientific literature also yielded no documented occurrences in or immediately adjacent to the project footprint. The closest known populations are located in the Fitzroy River and Snake Creek, as reported in Whitty et al (2017), situated well beyond the 2 km buffer. No population size estimates are available for these specific locations, but the Fitzroy River is recognised as an important nursery area for the species in Western Australia. Given the absence of confirmed records within the impact area and its immediate surroundings, it is unlikely that the proposed action will intersect any known population of <i>Pristis pristis</i>.</p>
<p><b>v) An assessment of the adequacy of any surveys undertaken (including survey effort and timing). In particular, the extent to which these surveys were appropriate for the listed species and migratory species and undertaken in accordance with relevant Departmental survey guidelines.</b></p>	<p>Although no targeted surveys for <i>Pristis pristis</i> have been conducted within the proposed action area itself, the broader region—including the Fitzroy River system and confluent creeks—has been extensively surveyed through multiple well-documented studies. These include:</p> <ul style="list-style-type: none"> <li>• Thorburn, D. C. (2006). <i>Biology, ecology and trophic interactions of elasmobranchs and other fishes in riverine waters of northern Australia.</i></li> <li>• Morgan, D.L., et al (2011). <i>North-western Australia as a hotspot for endangered elasmobranchs with particular reference to sawfishes and the Northern River Shark</i></li> <li>• Whitty et al (2017). <i>Habitat use of a Critically Endangered elasmobranch, the largetooth sawfish <i>Pristis pristis</i>, in an intermittently flowing riverine nursery.</i></li> <li>• Lear et al (2019) <i>Recruitment of a critically endangered sawfish into a riverine nursery depends on natural flow regimes.</i></li> </ul> <p>These studies have employed standard methods aligned with Departmental survey guidelines, including gillnetting, tagging, and tracking techniques appropriate for detecting</p>

	<p>and monitoring sawfish populations. Survey timing and effort have generally coincided with seasonal movements, including both wet and dry periods, to capture temporal habitat use. While these regional surveys are considered appropriate, it is noted that:</p> <ul style="list-style-type: none"> <li>• The proposed action area itself has not been surveyed directly, primarily due to its lack of suitable permanent aquatic habitat.</li> <li>• Given the absence of water during dry seasons (as confirmed by NDWI analyses), the area is unlikely to support <i>Pristis pristis</i> at any time of year, which further limits the need for dedicated in situ survey effort within the footprint.</li> </ul> <p>Therefore, the existing survey data from surrounding catchments are considered sufficient to inform the assessment and indicate that the likelihood of presence within the action area is very low.</p>
<p><b>22) The Department considers the proposed action may result in, but not be limited to, the following impacts: a) Vegetation clearance of critical habitats for listed species.</b></p>	<p>Vegetation clearing associated with the proposed action is highly unlikely to impact habitat critical to the survival of <i>Pristis pristis</i>. Habitat assessments, including NDWI analysis and database searches, indicate that the development envelope does not contain critical sawfish habitat.</p>
<p><b>23a) For each listed species, identify the quantum and quality of habitat or vegetation likely to be impacted.</b></p>	<p>The quality of habitat likely to be impacted by the proposed action is considered negligible for <i>Pristis pristis</i>, due primarily to the lack of suitable aquatic habitat within the development area.</p>
<p><b>23b) Identify the number of affected individuals and/or habitat features (e.g. potential breeding habitat, roosting trees, potential foraging habitat, movement pathways, etc.) relevant to each listed species</b></p>	<p>The number of <i>Pristis pristis</i> individuals or associated habitat features likely to be affected is expected to be very low to none. There is no identified critical habitat—such as breeding areas, nursery pools, or movement corridors—within the development envelope that would support key life history stages of the species.</p>
<p><b>10a) The Department notes there is limited recent survey data conducted within the last 3 years for the species. Please provided evidence of consideration of Approved Conservation Advice for <i>Pristis pristis</i> (largetooth sawfish).</b></p>	<p>The proposed action has been evaluated with reference to the Approved Conservation Advice for <i>Pristis pristis</i> (Department of the Environment, 2015), which outlines key threats, essential habitat requirements, and recovery objectives for the species. The Conservation Advice identifies the following key habitat features as critical for the species:</p> <ul style="list-style-type: none"> <li>• Tidal rivers, estuaries, and large freshwater river systems, especially those that maintain permanent water throughout the year;</li> </ul>

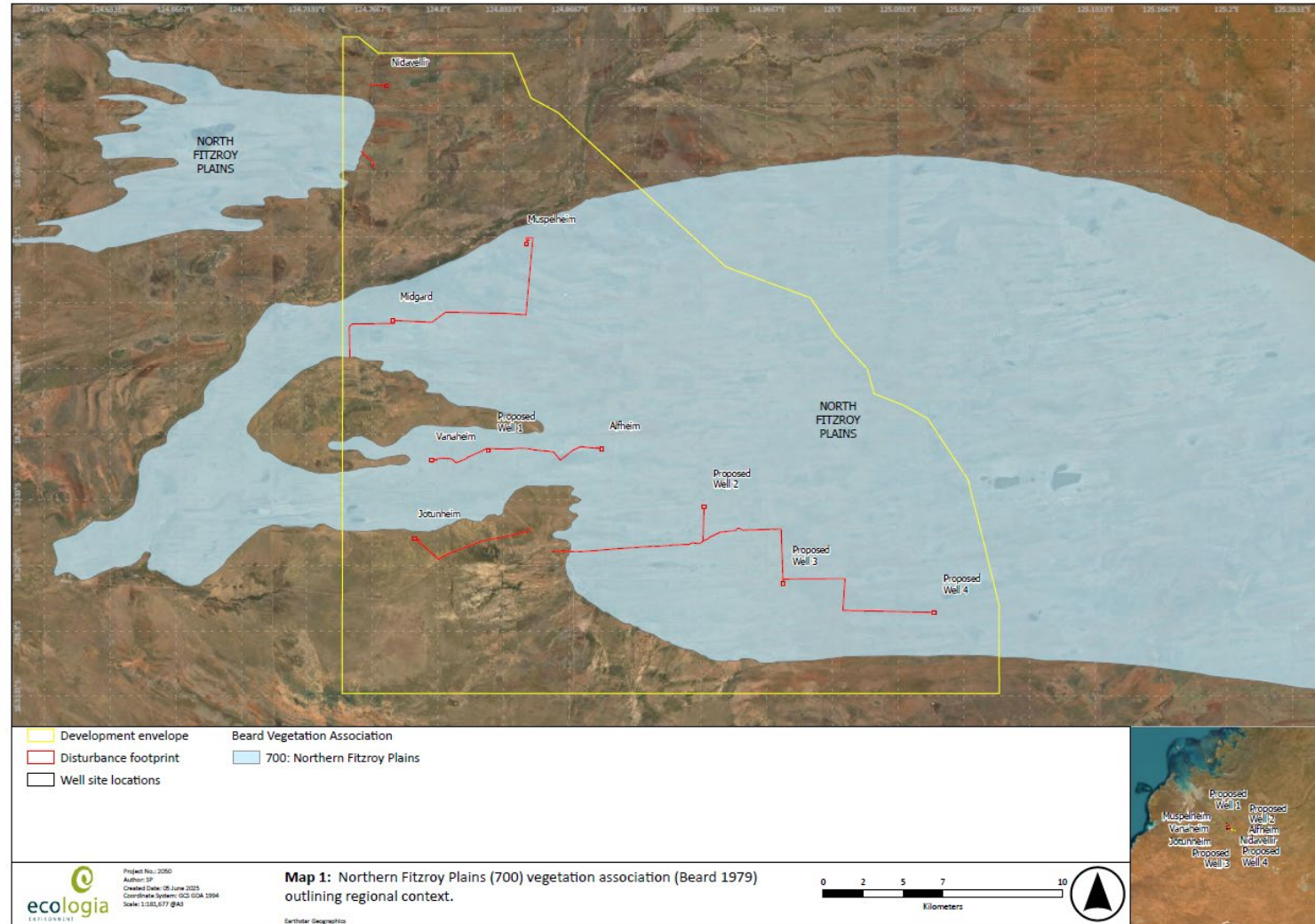
	<ul style="list-style-type: none"> <li>• Areas that support breeding, birthing, and juvenile development (nursery areas); and</li> <li>• Connectivity between freshwater and marine habitats.</li> </ul> <p>While Mount Hardman Creek intersects the development envelope, it is approximately 1km from the closest proposed bore location and does not meet these criteria: in consideration that;</p> <ul style="list-style-type: none"> <li>• There are no known records of <i>P. pristis</i> in or adjacent to the development envelope, as confirmed by database searches (ALA, Dandjoo) and literature review</li> <li>• In accordance with the Conservation Advice, the likelihood of this area functioning as critical or important habitat for the species is considered extremely low. The nearest known viable population and critical habitat occur in the Fitzroy River system, which retains connectivity, flow, and nursery habitat necessary for <i>P. pristis</i> survival.</li> <li>• While no recent surveys have been conducted specifically within the action area, this assessment is informed by the species' well-documented habitat preferences and extensive regional survey data (e.g. Whitty et al. 2017); Thorburn 2006.) supporting the absence of suitable habitat within the envelope.</li> </ul>
<p><b>b) Provide further information on the potential presence of suitable and critical habitat for the largemouth sawfish within and adjacent to the proposed action development envelope.</b></p>	<p>Mount Hardman Creek is highly unlikely to constitute critical habitat for <i>Pristis pristis</i> (largemouth sawfish), primarily due to the absence of permanent water throughout the year. Normal seasonal patterns, verified by NDWI analysis, indicate no surface water during the dry season, suggesting that the creek does not retain aquatic conditions required for year-round refuge or breeding. Furthermore, Mount Hardman Creek is at least 1 km from the nearest proposed bore location.</p>

	<p>The closest confirmed critical habitats for <i>P. pristis</i> remain the Fitzroy River and associated tributaries such as Snake Creek, where established populations persist and seasonal hydrological connectivity supports juvenile recruitment and growth. These systems are markedly more complex, permanently flowing in key reaches, and have been repeatedly cited in the literature (e.g. Morgan et al. 2011; Whitty et al. 2017) as critical for the Indo-West Pacific subpopulation.</p> <p>In summary, no evidence of critical habitat has been identified within or adjacent to the development area. While some potential suitability may exist during the wet season, the limited duration and spatial extent of inundation are not consistent with the species' known habitat requirements.</p>
<p><b>c) Demonstrate consideration of points 6 and 7 above, and sections 7 and 8 below. i) Ensure surveys to detect presence of the largemouth sawfish align with the Survey guidelines for Australia's threatened fish (Survey guidelines for Australia's threatened fish).</b></p>	<p>The <i>Survey Guidelines for Australia's Threatened Fish</i> identify gill netting and angling as the most appropriate methods for detecting <i>Pristis pristis</i>. Specifically, the guidelines recommend the use of 20 m gill nets with a 2 m drop, deployed for periods ranging from 1 to 16 hours. Angling is also considered a suitable supplementary method. The optimal survey period is identified as the start of the dry season, when river systems transition into isolated pools—providing ideal conditions for detecting sawfish in freshwater reaches. These recommended approaches are consistent with methods described in multiple peer-reviewed studies, including Whitty et al. (2017), Morgan et al. (2011), Thorburn (2006), and Lear et al. (2019). These studies employed:</p> <ul style="list-style-type: none"> <li>• Gill nets</li> <li>• Hook and line methods</li> </ul>

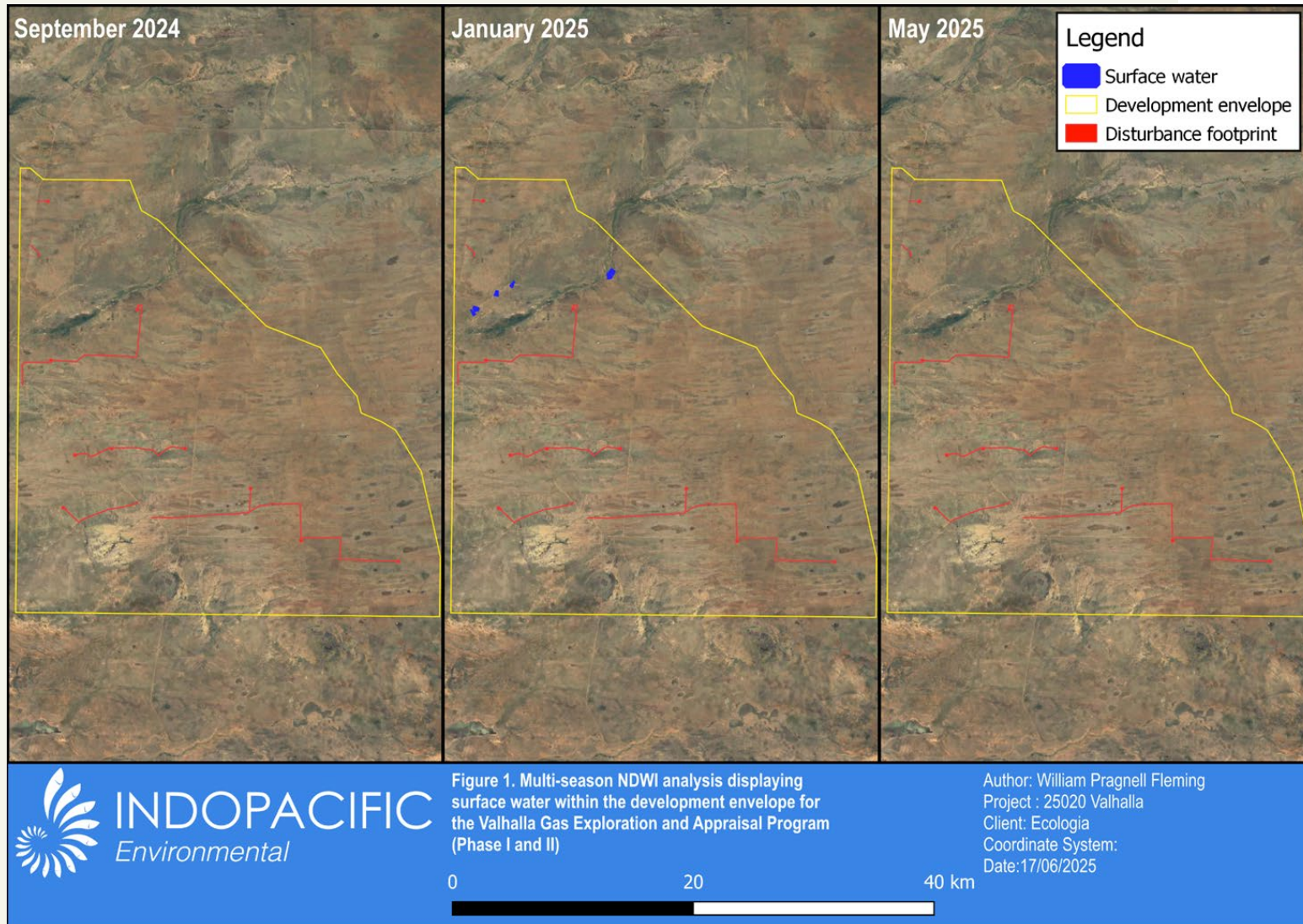
	<ul style="list-style-type: none"> <li>• Surveys conducted during the dry season in freshwater reaches—specifically targeting habitats with isolated pools, such as Camballin Pool and other reaches of the Fitzroy River known to support juvenile sawfish.</li> </ul> <p>Personnel involved in these efforts included Western Australian sawfish specialists from Murdoch University, including Dr. David Morgan and Dr. Thorburn, whose research is widely recognised and aligned with the Department’s survey guidelines. Survey methodologies historically applied in this region are well-aligned with the <i>Survey Guidelines for Australia's Threatened Fish</i> and are considered suitable for detecting <i>P. pristis</i> in appropriate habitat during relevant seasonal conditions.</p>
<p><b>Noting that neonate and juvenile largemouth sawfish primarily occur in the freshwater reaches of rivers and estuaries (Approved Conservation Advice for <i>Pristis pristis</i> (largemouth sawfish), demonstrate how the proposed action will not seriously disrupt the lifecycle of an ecologically significant proportion of the population of the migratory species.</b></p>	<p>Neonate and juvenile <i>Pristis pristis</i> are primarily associated with freshwater reaches of large, tidal rivers and estuarine environments, where they remain for several years post-partum (DCCEEW 2014). These habitats are critical for early life stage survival, providing food resources and refuge from predators.</p> <p>The proposed action area, including the Mount Hardman Creek intersection with the development envelope, has been assessed using NDWI analysis across multiple seasons (Dry season in 2024 and early/late wet season in 2025). This analysis indicates that surface water is highly seasonal, with findings suggest that the creek does not contain permanent water and is unlikely to provide the continuous aquatic habitat necessary for juvenile sawfish development.</p> <p>Furthermore, there are no historical or recent records of <i>P. pristis</i> within or adjacent to the proposed impact area, based on comprehensive searches of national databases (ALA, Dandjoo) and published literature. The closest confirmed occurrences are from the Fitzroy River and Snake Creek systems, located well beyond 2 km from the development area.</p>

These systems are widely recognized as critical nursery habitats due to their perennial flows and connection to estuarine and marine environments.

Given the lack of permanent aquatic habitat, absence of records, and significant distance from known populations, it is concluded that the proposed action will not seriously disrupt the lifecycle of an ecologically significant proportion of the *Pristis pristis* population. The site does not support essential behavioural patterns (e.g. breeding, juvenile development) and does not contribute to the long-term viability of the population.



**Map 1: Northern Fitzroy Plains (700) vegetation association (Beard 1979) outlining regional context.**



**Map 2: Multi-season NDWI Analysis**

## References

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