



Our Ref: DOC19/876417  
Your Ref: SSD\_9575\_Stage 2

Director Social and Other Infrastructure  
Planning and Assessment Group  
PO Box 39  
Sydney NSW 2001

Attention: Ms Aditi Coomar

Dear Ms Harragon

**RE: New Tweed Valley Hospital – Stage 2 (SSD\_9575) Tweed LGA**

Thank you for your e-mail dated 4 October 2019 about the Tweed Valley Hospital Stage 2 at 771 Cudgen Road, Cudgen, seeking comments from the Biodiversity and Conservation Division (BCD) of the Environment, Energy and Science Group in the NSW Department of Planning, Industry and Environment. I appreciate the opportunity to provide input.

The BCD was formerly part of the Office of Environment and Heritage, but now forms part of a Group that has responsibilities relating to biodiversity (including threatened species and ecological communities, or their habitats), Aboriginal cultural heritage, National Parks and Wildlife Service (NPWS) estate, climate change, sustainability, flooding, coastal and estuary matters.

We have reviewed the documents supplied and have no issues to raise about Aboriginal cultural heritage, NPWS estate, climate change, sustainability, or flooding matters. However, several issues are apparent for biodiversity matters as per our detailed comments in **Attachment 1** to this letter.

In summary, we provide the following recommendations.

1. Stormwater and impacts on coastal wetland

- a. Greater effort should be given to reducing the stormwater volumes entering the basins, such as including more storage and reuse of runoff and more use of swales and raingardens in suitable locations.
- b. The recommendations outlined in the SMEC report for refinements to the basin outflow design and for greater channel infiltration to ensure stormwater discharge is managed to reduce impacts on the wetland should be incorporated into final engineering designs and documentation.
- c. Following the above actions 1(a) and 1(b), the SMEC report should be revised to better demonstrate that the impact of more frequent wetting events will be negligible or can be satisfactorily mitigated.
- d. Regular routine maintenance of the bioretention systems and enviropods should be included in an operational procedures plan.

- e. A condition of consent be included to ensure there is an emergency procedure in place to prevent contamination spills (such as diesel or other fuels) entering the sensitive receiving environment.

## 2. Biodiversity management

- a. The Biodiversity Management Plan (BMP) should be amended to specify where the single stinking *Cryptocarya* *Cryptocarya foetida* plant (sapling) to be removed from along the Cudgen Road boundary windrow has, or will be, translocated to, including mapping this location in Figure 4. If it has already been translocated, then the Biodiversity Development Assessment Report (BDAR) should report on how successful the translocation has been.
- b. The BMP should be amended to remove the recommendation that duck weed, *Lemna* spp. or azolla *Azolla filiculoides* be introduced to outcompete and potentially suppress the growth of salvinia.
- c. Section 3.5 of the BMP states that no pets are permitted in areas of 'environmental conservation' on site. The section should define the environmental conservation areas and how pet access will be restricted from the area.
- d. The threatened species monitoring and reporting requirements must include details on who will commission the ongoing long term monitoring and reporting for the Mitchell's land snail, who the reports will be sent to and who needs to act on them if the results show the population is declining.
- e. Implementation of the threatened species monitoring program should be included as a condition of consent.
- f. The detailed procedure for fauna surveys, fauna rescues (if required) and rehabilitation details provided in the BMP should be adopted.

## 3. Dam infill operation

- a. Include a requirement for the dam infill operations to be staged over a period of days to allow for adequate salvage of animals from the dam.
- b. Require the use of turtle/yabby nets to capture and relocate turtles, eels and yabbies that might have been missed through the electrofish/ gill net operations.
- c. The capture method should employ not only opportunistic sweeps but systematic sweeps to hand net the decreasing sections of remaining water to capture any remaining fauna as it is incrementally infilled.

## 4. Landscaping

- a. Consideration be given to opportunities to create more 'stepping stone' habitats throughout the lawn areas of the site and elsewhere if appropriate and expand landscaped areas in the south-west corner and along the perimeter road as they are not required to be managed for bushfire asset protection.
- b. The Turf report should provide details of how many koala food trees will be planted and the locations of these plantings.
- c. Consideration be given to planting koala food trees in the south west corner (Area 7 in the Landscape Zonal Plan (LZP)) and lawn area (labelled 10 in the LZP) along the northern boundary adjacent to the retained vegetation.



## 5. Koala safety and fencing

- a. Koala crossing advisory signage should be installed on Turnock and Cudgen Road.
- b. A wildlife crossing to the northeast of the Site where the Turnock Street roadway passes through the remnant vegetation between the two Turnock Street roundabouts should be established as per Mitigation Measure 34.
- c. A condition of consent be included to ensure that no boundary fencing will be in the retained vegetation. If any fencing is required, this should be installed in the lawn area and would also be a need to provide safe passage for koalas between the lawn area as it will contain koala food trees. Any fencing should be wildlife friendly and include a 'post and bridge' system or other koala friendly crossing in accordance with published guidelines (KRS 2009) to facilitate movement of koalas and other arboreal mammals.

## 6. Aviation operations

- a. Revise the Avipro report to consider other potential locations for flying-fox camps, as identified in the Tweed and through discussions with Tweed Shire Council and any wildlife carer organisations operating in the region, such as the Elrond Drive, Chinderah flying-fox camp, be thoroughly investigated to ensure that if present the risks to these camps will also be a consideration for the helicopter operations.
- b. Require an Aviation Operations Manual to be prepared that includes:
  - i. measures to reduce bird strike (including bats),
  - ii. prescribes a planned approach and departure paths to the HLS that minimises impacts on environmentally sensitive areas, and
  - iii. requires documentation of all native fauna injuries and deaths in an incident register.

## 7. E2 zoning for retained vegetation

- a. Health Infrastructure to advise on progress to rezone the retained native vegetation in the northern part of the site to E2 Environmental Conservation.

If you have any questions about this advice, please do not hesitate to contact Ms Rachel Lonie, Senior Conservation Planning Officer, at [rachel.lonie@environment.nsw.gov.au](mailto:rachel.lonie@environment.nsw.gov.au) or 6650 7130.

Yours sincerely

 7 November 2019

**DIMITRI YOUNG**  
**Senior Team Leader Planning, North East Branch**  
**Biodiversity and Conservation**

Enclosure: Attachment 1. Detailed BCD Comments – New Tweed Valley Hospital – Stage 2 (SSD-9575) Tweed LGA





## **Attachment 1: Detailed BCD Comments – New Tweed Valley Hospital – Stage 2 (SSD18\_9575)**

The SSD application is for Stage 2 of the Tweed Valley Hospital Project (the Project) and seeks consent for the Main Works and Operation of the Hospital including:

- Construction of Main Hospital Building including a rooftop helipad;
- Construction of Support Buildings, referred to as the 'Health Hub';
- Internal roads and car parking, including multi-deck parking for staff, patients and visitors;
- Construction of a temporary building for the 'Tweed Valley Skills Centre';
- External road infrastructure upgrades and main site access;
- Environmental and wetland rehabilitation, including rehabilitation of existing farm dam as outlined in the Biodiversity Development Assessment Report (BDAR);
- Site landscaping; and
- Signage, utility and services.

The Biodiversity and Conservation Division (BCD) has reviewed the following documentation:

- Stage 2 Environmental Impact Statement (EIS) prepared by GeoLINK (2019),
- Appendix U Stage 2 Biodiversity Development Assessment Report (Stage 2 BDAR) by Greencap (September 2019);
- Biodiversity Management Plan (BMP) which is comprised of three subplans:
  - Vegetation Management Plan (VMP)
  - Fauna Management Plan (FMP)
  - Water Quality Management Plan (WEQMP);
- Ecological Assessment Report – Hydrological and Stormwater Runoff Impacts Greencap (September 2019);
- Appendix S Part 1 Stormwater Management Plan (SWMP) (Robert Bird Group 2019);
- Appendix S Part 2 Tweed Valley Hospital Hydrology Assessment – Draft Final Rev 2 (SMEC 2019);
- Project Construction Environmental, Health & Safety Management Plan (CEMP) Issue No 5.0 (Lendlease Building Pty Ltd 2019);
- Landscape Report (Turf September 2019); and
- associated reports and technical drawings.

The following advice is provided on biodiversity related matters.

### **1. Stormwater management**

The Tweed Valley Hospital Hydrology Assessment by SMEC 2019 (Appendix S of the EIS) considers the potential ecological impacts of stormwater management on the site on the two threatened ecological communities (TECs) (Swamp sclerophyll forest on coastal floodplains of the NSW North Coast, Sydney Basin and South East Corner bioregions and Lowland rainforest on floodplain in the NSW North Coast Bioregion) and threatened species including Mitchell's rainforest snail, Wallum froglet and Olongburra frog. The SMEC report found that after the application of mitigation measures for surface and groundwater management practices, the risks to these threatened entities were very low. The mitigation measures include converting existing sediment basins to bio-detention basins post development and the capture and reuse of rainwater for irrigation and for the cooling tower.

#### Changes to stormwater quantity

The hydraulic modelling (Appendix S) by the Robert Bird Group (RBG) and as reviewed by SMEC predicted the mean total annual flow from the site would increase by almost 50% from pre development (90.6ML/yr) to post development (140 ML/yr) conditions for 2003-2017 data. The reason given for the large increase is that the development has a significant area that has become impervious (roofs, car parks, roads, paths) compared to the original agricultural land that readily allowed infiltration.



The proposed stormwater detention will ensure that the post development discharge rate does not exceed the pre-development rate in the 100-year and 5-year ARI events. However, the results confirmed that the developed flows are almost double the existing flows for the 50% AEP, 1EY and 4EY rainfall events. It is these more frequent minor events that are more critical for sensitive receiving environments such as the wetland TEC as wetting and drying regimes are important to maintaining ecosystem health.

We note the reference to the former OEH guidelines for impacts of development on OEH land. The guidelines state that the discharge of stormwater to OEH land, where the quantity and quality of stormwater differs from natural levels, must be avoided. Although the guidelines do state there should be no increase in pre-development peak flows from rainfall events with a 1 in 5 year and 1 in 100 year recurrence interval, they also state there should be no increase in the natural average annual runoff volume. This target has not been met and the RGB report does not address this issue.

The SMEC report considers the impacts of increasing frequency of minor runoff events into the wetland finding the change in wetland levels will be less than 50 mm and be expected to return to normal levels within a day or so. The report concludes this is unlikely to result in any significant structural change to the dominant floristics of the swamp sclerophyll forest. It does not however reference any relevant scientific literature or even any anecdotal findings to support this conclusion.

The SMEC report includes advice that the infiltration rate on site is very high and removing the liner from the basins would assist in reducing total outflow. It states it is likely that the infiltration will make its way to the wetland via groundwater. It is proposed that the bio-detention basin liners will be perforated to allow for infiltration to groundwater. We note the advice that other opportunities for infiltration are limited due to the concerns raised by the geotechnical engineer that significant infiltration could result in instability of the steep batter slopes within the site.

The BCD acknowledges the potential impacts on TECs as a result of changed hydrology are not well studied and we are not aware of any suitable guidelines that could be used in this case other than the target to limit post development discharge to pre-development levels. Despite the mitigation measures proposed, including capture and reuse of rainwater from roof runoff, an increase in total annual flow volume of approximately 50% does not achieve the desired target.

For this reason, we recommend that greater effort be given to reducing the stormwater volumes entering the basins such as including more storage and reuse of runoff and more use of swales and raingardens in suitable locations. Following this, the BCD recommends the SMEC report be revised to better demonstrate that the impact of more frequent wetting events will be negligible or can be satisfactorily mitigated, perhaps drawing on other examples of where changes to hydrological processes and impacts on wetland TECs have been studied.

#### Changes to basin design

The SMEC report states that although it is not a design requirement to reduce the higher frequency flows, further assessment could be carried out to refine the basin outflow design (such as staged outlets) to reduce outflows to existing peak flows for a greater range of events to minimise the impact on the coastal wetland. It states that although the basin outlets are designed with scour protection a detailed design was not yet available.

The SMEC report suggests the channel from the basin to the outlet point could be made narrower and deeper, to slow down and spread the water where it discharges to the wetland. Staging the basin outlets was recommended to reduce peak discharges during more frequent events than the 1% and 5% AEP design events. SMEC also suggests the channels could be designed for additional infiltration as discussed in the groundwater section 3.4 and that it was expected options would be addressed during the design by RBG. It is not clear that these recommendations have been incorporated into the final engineering design and documentation.

Therefore, to address impacts from the increased volume of stormwater discharge we recommend that the refinements to the basin outflow design (staged outlets and narrow channel design) outlined



in the SMEC report be adopted and incorporated into the final engineering designs and documentation.

### Changes to stormwater quality

Stormwater runoff will be treated to achieve pollution reduction targets using a standard treatment train approach, grass swales, buffers and pit filter baskets in conjunction with the proposed bio-detention basins. It is noted that the proposal achieves the required pollutant load targets and that this will improve water quality. The sediment controls will also have a positive impact on the TECs and associated threatened species habitat.

Regular routine maintenance of the bioretention systems and enviropods will be critical to maintaining these standards and should be included in an operational procedures plan. We note the risk identified with removing basin liners and allowing for groundwater infiltration and contamination spills. We recommend this be addressed through conditions of consent to ensure there is an emergency procedure in place to prevent contamination spills (such as diesel or other fuels) entering the sensitive receiving environment.

## **2. Infilling of existing dam in north west corner**

The Stage 1 BDAR recommended that decommissioning the dam would remove the requirement for ongoing monitoring and treatment of salvinia (*Salvinia molesta*). A condition of consent B21(l) required the Biodiversity Management Plan (BMP) to include proposed measures of rehabilitating the existing dam at the north-western corner of the site to prevent the growth of salvinia in the dam and agricultural drain.

Analysis of the impact of any change in hydrological flows on the wetland as a result of infilling the dam was undertaken by SMEC (2019). This identified that filling the dam back to natural ground level will have no impact on the 1% AEP or 20% AEP flood levels and no material impact from more frequent events post development (SMEC 2019).

The BMP provides a best-practice method to be employed to decommission the dam and mitigate impacts on native flora and fauna. This states that the dam will be incrementally infilled from one end by tipping re-use rock (up to 150mm diameter) and topsoil from site into the dam from a dump truck without pumping the water out. However, it does not specify the time frame for the incremental infill operation. The BCD recommends the infill operations should be staged over a period of days to allow for adequate fauna salvage.

The BCD supports the recommendations that a suitably qualified and experienced fauna rescue person shall be present for the dam decommissioning, including the removal of any vegetation around the dam. The method states that efforts will be made to rescue and relocate any native fauna which may currently be in the dam, which could potentially include fish, eels, turtles, yabbies and tadpoles.

Freshwater turtles may be submerged in the mud layer and could require greater efforts to trap and relocate them and the infilling operations must ensure that they are not suffocated and buried. Freshwater turtle deaths may also occur once the waterbody has been filled and the reptiles move elsewhere to find alternative water bodies. We recommend that an additional action be included for freshwater turtles that includes trapping and relocation by professional wildlife rescuers/relocation team.

The BCD recommends that after the 1st sweep with electrofish/ gill nets, that turtle/yabby nets be used to capture and relocate turtles, eels and yabbies that might have been missed through the electrofish/ gill net operations. Also, the method should employ not only opportunistic sweeps but systematic sweeps to hand net the decreasing sections of remaining water and capture any remaining fauna as it is incrementally infilled.



### 3. *Salvinia* exclusion

Section 2.4.2 of the Vegetation Management Plan (VMP) states that consideration should be given to planting native aquatic species such as nardoo *Marsilea mutica*, duck weed, *Lemna spp.* or azolla *Azolla filiculoides* that may outcompete and potentially suppress the growth of *salvinia*. Although Azolla and duck weed (*Lemna minor*) are native species and Azolla spp were included in Appendix B - Tweed Valley Hospital Recommended Species Lists MZ 2.3 and 5 of the Stage 2 BMP, these plants are identified as water weeds (see <https://www.dpi.nsw.gov.au/biosecurity>). We recommend that they should not be planted in the bio-retention basins as they could spread to other waterways.

### 4. Stepping stones and connectivity

To mitigate the loss of areas that currently contribute to connectivity for biodiversity by providing 'stepping stone' habitats, the BDAR Stage 1 identified the following mitigation actions:

- a 10 m wide vegetation buffer along the western boundary of the site to connect to the retained vegetation in the northern portion of the site in a north-south direction
- existing stepping stone habitats in the southern portion of the site would be replaced with new and additional stepping stone habitats in the form of raingardens to provide habitat for threatened species within the cleared areas of the site.

The implementation of these mitigation measures (including raingardens, vegetated bio-detention basins and stepping stone habitats) are not apparent in the Landscape Report by Turf (Appendix D). There is little consideration of biodiversity issues in the Turf report or interaction with the BMP recommendations.

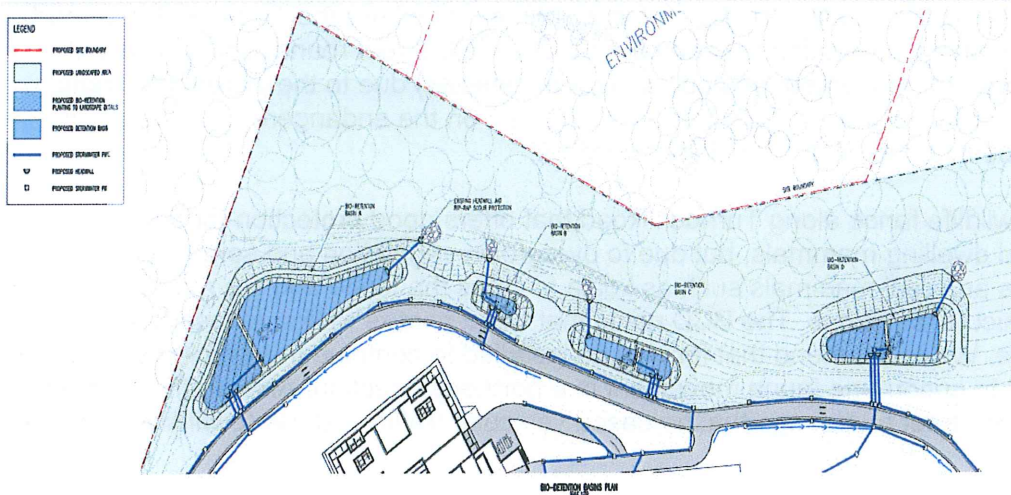
For example, despite a reference to the use of raingardens in both the BDAR and SMEC reports, only one raingarden is proposed in the Landscape Plan. We noted above that opportunities for more raingardens and vegetated swales may be limited due to site instability, but this has not been elaborated on in the landscape documentation.

Section 3.3.2 on Habitat corridors in the Fauna Management Plan (FMP) identifies the importance of facilitating the movement of fauna by retaining and augmenting vegetated buffer zones (MZs 6 and 7). The FMP states that vegetated buffer zones will connect to the retained Subtropical Rainforest vegetation in the northern portion of the site and will run north to south in line with the mapped regional fauna corridor to provide important stepping-stone and refuge habitat for threatened species and improve connectivity. We note that the western boundary buffer is not continuous and cannot be continued northward due to the need for a bushfire asset protection zone (APZ) for the hospital. However, now that the APZ has been better defined there is an opportunity to plant in the lawn area around the north west bio-detention basin on the perimeter of the APZ to create more 'stepping stone' connectivity. This needs to be better documented in the Landscape Design Report.

Table 9 Fauna Mitigation Measures in the FMP also states that, where possible, landscaping will include habitat features such as rocks that have been salvaged from other areas of the site, such as cleared windrows, to create habitat for ground dwelling species. The Landscape Design Report only talks about "potential" reuse of boulders and only in the raingarden.

New plantings in the sediment basins were proposed to both treat stormwater quality and contribute to providing a range of native habitat or 'moist corridors' across the site. The BCD notes that only portions of the future bio-detention basins will have planted sections as described in Figure 1 and, as the liners will be perforated, there will be no standing water. This reduces the potential habitat that could be established here. There is no discussion on why the planted areas are so limited in the bio-detention basin areas.





### Figure 1. Engineering details for the bio-detention basins

There are more opportunities that have not been considered to increase biodiversity values and mitigate some of the impacts of the proposed development on biodiversity values as well as provide landscape features that could deliver a more ecologically sustainable approach and its associated health benefits.

The recommendation in the VMP for edge planting of buffer areas does not appear to be incorporated into the Landscape Masterplan. The Turf report lists *Eucalyptus microcorys* and *E. propinqua* as tree species to be planted in the vegetated buffers, but does not prescribe the number to be planted or the planting locations. The BCD supports planting of these two eucalypt species as they are koala food trees. We recommend that the Turf report provide details of how many koala food trees will be planted and the location for these. Koala food trees could also be planted in the south west corner (Area 7 in the Landscape Zonal Plan (LZP)) and lawn area (labelled 10 in the LZP) along the northern boundary adjacent to the retained vegetation.

There are also opportunities to expand landscaped areas in the south-west corner and along the perimeter road both labelled 9 in Figure 6.1 Landscape Zonal Plan by Turf as they are not required to be managed for asset protection.

Area 9 is to be a hydromulched and drill-seeded low maintenance lawn area noting the potential for future hospital expansion. Grasses are to be couch and buffalo grass. There are opportunities for more natural grassland areas to be established in areas such as Area 9 thereby providing habitat for birds and ground dwelling animals such as lizards and skinks. Such areas could be more naturalised rather than being couch and buffalo mown lawns, so that, for example, native grasses are used that create habitat and that are allowed to seed. Also, such areas could allow for more habitat creation such as providing small rockeries, retaining woody debris etc.

#### 4. Koala crossings and wildlife safety

The FMP outlines the risks for koala *Phascolarctos cinereus* and the existence of an endangered koala population between the Tweed River and Brunswick River east of the Pacific Highway. Recently uploaded Bionet records for koalas (Dan Lunney Community Survey results loaded 28/29 October 2019) shows there are numerous records dating back over the last 20 years, including recent records, in the vicinity of the site.

Vehicle traffic volumes will increase considerably as a result of the development and vehicular collisions are a known high risk for koalas, especially associated with increased vehicle speeds. Section 3.8.1 of the BMP provides traffic management measures to reduce the risk of impacting wildlife during the construction and/or operations phase of the Project.

The BCD supports these measures, particularly limiting vehicle speeds to 20km/hr on internal roads and access ways. The Stage 2 BDAR (p82) states that koala crossing advisory signage should be



installed to establish a wildlife crossing to the northeast of the Site where the Turnock Street roadway passes through the remnant vegetation between the two Turnock Street roundabouts. This will mitigate impacts on wildlife (movement and collisions with vehicles) due to the increase in traffic numbers along Cudgen Road and Turnock Street, particularly on the endangered population of Koalas. This should be included as a condition of consent.

It is noted there is a wildlife fence along Turnock Road that offers good protection for small to medium sized ground dwelling mammals, but due to overgrown vegetation and some lack of maintenance it allows arboreal mammals such as koala to cross the fence and the road, placing such animals at risk of vehicular collisions. The BCD notes that weed control works will assist in maintaining this fence. We recommend that fencing be installed to continue this fencing southward along Turnock Street to encourage fauna movement in a northerly direction. Also, traffic calming is needed along Turnock Street to manage the increased vehicular traffic and risk to wildlife as a result of the development.

## **5. Fencing**

The BMP (section 3.3) states the primary impact on movement of threatened species relates to boundary fencing of the site. The only existing permanent fencing in proximity to the site is the wildlife fencing along the Turnock St roadside outside the subject site.

The documentation states the temporary fencing will be removed at the completion of the construction phase of the development and there is no intention for a permanent boundary fence to be installed for the operation of the project, thereby allowing movement of threatened species. No fencing therefore is proposed along the northern site boundary (i.e. through the retained vegetation area). The BCD supports this approach.

However, it may be desirable to restrict access into the retained vegetation area from the hospital complex to protect the conservation values of the area. Unrestricted access (such as dog walkers) could result in weed and feral animal incursions, vegetation trampling and disturbance to wildlife.

We recommend that a condition of consent be included to ensure that no boundary fencing will be located in the retained vegetation. If any fencing is required, this should be installed in the lawn area. There would also be a need to provide safe passage for koalas between the lawn area and adjoining habitat areas such as the coastal wetland as the lawn area will contain koala food trees and there are existing koala food trees along the Turnock Road boundary. Any fencing should be wildlife friendly and include a 'post and bridge' system or other koala friendly crossing in accordance with published guidelines (KRS 2009) to facilitate movement of koalas and other arboreal marsupials.

## **6. Impacts on birds and bats**

Section 3.2.7.3 of the Stage 2 BDAR describes the operation of a helicopter landing site (HLS) on the top of the Hospital building resulting in low level air traffic in the vicinity of the site. The flight path is shown as being in a north-south direction. Considering the timing and frequency of flights, the BDAR concluded the probability of bird strikes on flying foxes was considered very low. This is supported by a report by Avipro dated September 2019.

The Avipro report includes a map of the probable flight path, which only considers one flying-fox camp. The report states the preferred and safest approach and departure directions are north-south and this avoids sensitive areas such as the one known area of significant biodiversity interest (flying-fox camp). It does not identify another flying-fox camp located approximately 1.3 kms north of the site which is known as the Elrond Drive, Chinderah camp as identified in the Tweed Flying-fox Camp Management Plan by Ecosure dated March 2018 and Appendix I of the BDAR (see Figures 2 and 3).



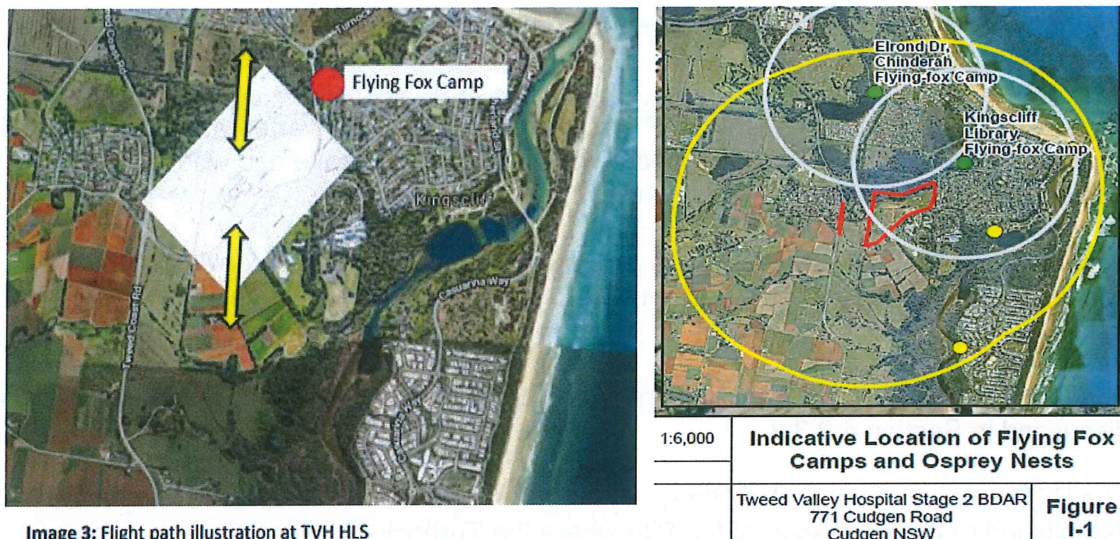


Image 3: Flight path illustration at TVH HLS

**Figure 2 Flight path map from Avipro report and Figure 3 BDAR Appendix I showing two flying-fox camps in the vicinity of the hospital site.**

The Avipro report states that nearer to HLS commissioning, helicopter operators will be apprised of the exact location of the flying fox camp and procedures will be developed in consultation to provide maximum clearance on each occasion a HEMS helicopter approaches or departs the hospital. The details on how this information will be developed and who will be consulted is not provided. The Avipro report also states that the location of the sensitive areas may be advised to ASA for possible inclusion in relevant publications, but again does not describe who will provide this advice and does not make it a requirement.

The BCD recommends that the Elrond Drive, Chinderah flying-fox camp and any other potential locations for flying-fox camps, as identified through discussions with the Tweed Shire Council and local wildlife carer organisations managing flying-foxes, be considered to ensure that any risks arising from the helicopter operations are addressed.

The BMP recommends aviation operations be conducted in accordance with an Approved Aviation Operations Manual that includes:

- measures to reduce bird strike (including flying-foxes and bats);
- prescriptions for planned approach and departure paths to the HLS that minimise impacts on environmentally sensitive areas; and
- a requirement for documentation of all native fauna injuries and deaths in an incident register.

The preparation and implementation of an operational plan that includes these measures should be included in the conditions of consent.

## 7. Mitchell's Land Snail

In reference to Section 6.3.4 Threatened Species Monitoring of the Stage 2 BDAR, we question who will commission the ongoing long-term monitoring and reporting, who will these reports be sent to and who needs to act on them if the results show the population is declining. These details need to be included and form part of the consent conditions.

## 8. *Cryptocarya foetida*

The VMP does not appear to specify the location where the single stinking *Cryptocarya foetida* plant (sapling) to be removed from along the Cudgen Road boundary windrow has, or will be, translocated. This should be more clearly identified, for example in Figure 4 of the VMP.

## 9. Previous recommendations that do not appear to have been addressed

The advice we provided on the draft BMP to Greencap dated 16 September 2019 included the following comments:

- a. Under Section 3.2.2 page 52 the BMP states that a specialist invertebrate consultant will submit a report. The BMP should specify who the report will go to and who will be responsible for any corrective actions that are required.
- b. Section 3.5 of the BMP states that no pets are permitted in areas of 'environmental conservation' on the Site. This section should define the environmental conservation areas.
- c. The BMP should specify who will maintain the bio-detention systems post development as discussed in Section 4.2.3.2.
- d. The BCD notes and supports Mitigation Measures No. 34 for a wildlife crossing to be established to the north-east of the Site where the Turnock Street roadway passes through the remnant vegetation.

As these do not appear to have been addressed they are repeated as recommendations below.

For the Stage 1 SSD the former OEH recommended the Stage 2 project should report on progress to rezone the retained native vegetation in the northern part of the site to E2 Environmental Conservation. We note that the Tweed Shire Council has also included this recommendation in its Stage 1 comments and therefore supports this action. This does not appear to have been actioned.

## **Recommendations**

The BCD recommends the following:

### **1. Stormwater and impacts on coastal wetland**

- a. Greater effort should be given to reducing the stormwater volumes entering the basins such as including more storage and reuse of runoff and more use of swales and raingardens in suitable locations.
- b. The recommendations outlined in the SMEC report for refinements to the basin outflow design and for greater channel infiltration to ensure stormwater discharge is managed to reduce impacts on the wetland should be incorporated into final engineering designs and documentation.
- c. Following the above actions 1(a) and 1(b), the SMEC report should be revised to better demonstrate that the impact of more frequent wetting events will be negligible or can be satisfactorily mitigated.
- d. Regular routine maintenance of the bioretention systems and enviropods should be included in an operational procedures plan.
- e. A condition of consent be included to ensure there is an emergency procedure in place to prevent contamination spills (such as diesel or other fuels) entering the sensitive receiving environment.

### **2. Biodiversity management**

- a. The Biodiversity Management Plan should be amended to specify where the single stinking *Cryptocarya foetida* plant (sapling) to be removed from along the Cudgen Road boundary windrow has, or will be, translocated to including mapping this location in Figure 4. If it has already been translocated, then the BDAR should report on how successful the translocation has been.



- b. The Biodiversity Management Plan should be amended to remove the recommendation that duck weed, *Lemna spp.* or azolla *Azolla filiculoides* be introduced to outcompete and potentially suppress the growth of salvinia.
- c. Section 3.5 of the BMP states that no pets are permitted in areas of 'environmental conservation' on site. The section should define the environmental conservation areas and how pet access will be restricted from the area.
- d. The threatened species monitoring and reporting requirements need to include details on who will commission the ongoing long-term monitoring and reporting for the Mitchell's land snail, who the reports will be sent to and who needs to act on them if the results show the population is declining.
- e. Implementation of the threatened species monitoring program should be included as a condition of consent.
- f. The detailed procedure for fauna surveys, fauna rescues (if required) and rehabilitation details provided in the BMP should be adopted.

### 3. Dam infill operation

- a. Include a requirement for the dam infill operations to be staged over a period of days to allow for adequate salvage of animals from the dam.
- b. Require the use of turtle/yabby nets to capture and relocate turtles, eels and yabbies that might have been missed through the electrofish/ gill net operations.
- c. The capture method should employ not only opportunistic sweeps but systematic sweeps to hand net the decreasing sections of remaining water to capture any remaining fauna as it is incrementally infilled.

### 4. Landscaping

- a. Consideration be given to opportunities to create more 'stepping stone' habitats throughout the lawn areas of the site and elsewhere if appropriate and expand landscaped areas in south west corner and along the perimeter road as they are not required to be managed for asset protection.
- b. The Turf report should provide details of how many koala food trees will be planted and the locations of these.
- c. Consideration should be given to planting koala food trees in the south west corner (Area 7 in the Landscape Zonal Plan (LZP)) and lawn area (labelled 10 in the LZP) along the northern boundary adjacent to the retained vegetation.

### 5. Koala safety and fencing

- a. Require koala crossing advisory signage to be installed on Turnock and Cudgen Road.
- b. Establish a wildlife crossing to the northeast of the Site where the Turnock Street roadway passes through the remnant vegetation between the two Turnock Street roundabouts as per Mitigation Measure 34.
- c. A condition of consent be included to ensure that no boundary fencing will be located in the retained vegetation. If any fencing is required, this should be installed in the lawn area and would also be a need to provide safe passage for koalas between the lawn area as it will contain koala food trees. Any fencing should be wildlife friendly and include a 'post



and bridge' system or other koala friendly crossing in accordance with published guidelines (KRS 2009) to facilitate movement of koalas and other arboreal marsupials.

## **6. Aviation operations**

- a. Revise the Avipro report to consider other potential locations for flying-fox camps, as identified in the Tweed and through discussions with Tweed Shire Council and any wildlife carer organisations operating in the region, such as the Elrond Drive, Chinderah flying-fox camp, be thoroughly investigated to ensure that if present the risks to these camps will also be a consideration for the helicopter operations.
- b. Require an Aviation Operations Manual to be prepared that includes:
  - i. measures to reduce bird strike (including bats),
  - ii. prescriptions for planned approach and departure paths to the HLS that minimise impacts on environmentally sensitive areas, and
  - iii. a requirement for documentation of all native fauna injuries and deaths in an incident register.

## **7. E2 zoning for retained vegetation**

- a. Health Infrastructure to advise on progress to rezone the retained native vegetation in the northern part of the site to E2 Environmental Conservation.