APPENDIX 6-2

MACROPHYTE REPORT

Rialtas na hÉireann
Government of Ireland

Arna chomhchistiú ag an Aontas Eorpach
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Tionól Reigiúnach Oirthir agus Lár-Tíre
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Fáilte Ireland

ROSCOMMON
Comhairle Contae Ros Comáin
Roscommon County Council

Waterways Ireland

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Planning and Environmental Consultants

Aquatic Macrophyte Survey Report

Hodson Bay Waterfront Park, Co. Roscommon

DOCUMENT DETAILS

Client:	**Roscommon County Council**
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Planning and Environmental Consultants

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01	Final	04/08/2026	NR	AvdGM

Contents

1. INTRODUCTION

1.1 Context

MKO was commissioned to undertake macrophyte surveys within areas of Eutrophic lake (FL5) habitat in Lough Ree, occurring at the Proposed Development at Hodson Bay, Co. Roscommon. Surveys aimed to provide an evaluation of conformity with the habitat *3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation,* listed in Annex I of the EU Habitats Directive and included as a Qualifying Interest of Lough Ree SAC [Site code: 000440], as well as provide a baseline of macrophytes recorded within the lake habitat within and adjacent to the Proposed Development.

Surveys included transect surveys conducted via a combination of manual wading, grapnel throws and using an aquatic drone in prohibitively deep water which could not be waded.

Manual wading surveys and grapnel throws, and Aquatic drone surveys were conducted on 16th July 2025 and 28th July 2025, respectively, by Aran von der Geest Moroney and Niamh Rowan of MKO.

Detailed methodologies and guidance followed during these surveys are outlined below.

2. SURVEY METHODS

2.1 Macrophyte transect surveys

Dedicated macrophyte surveys were undertaken by MKO along transects extending from the shore of Lough Ree within, adjacent to and in the vicinity of the Proposed Development Site. Methodology to conduct both qualitative manual wading surveys and qualitative aquatic drone surveys was based on standard methodology used by the Environmental Protection Agency to assess the status of water bodies in relation to the EU Water Framework Directive (EPA, 2020). Transects were waded or surveyed using a FIFish aquatic drone (methodologies as per: Keena & Lally, 2023).

4 no. transects from the shoreline were waded, 1 no. transect was surveyed via grapnel throw, while 9 no. transects were surveyed using an aquatic drone. The length of wading transects were determined by the wadable depth of water at each. While the tether of the drone measures 100 m, the length of drone transects conducted was approx. 90 m from the starting point, taking into account the effect of currents within Lough Ree. Using the robotic arm attachment on the aquatic drone, grab samples were taken along each of the aquatic drone transects. Locations of both manual wading surveys and aquatic drone surveys are shown in Figure 2-1.

Plants were viewed using a bathyscope or aquatic drone camera along respective wading and drone transects. Along wading transects, plants were sampled periodically using grapnel throw or manual hand collection, while samples were obtained via the robotic arm of the aquatic drone periodically throughout deeper water transects. Species were noted along each transect, with an assessment of their abundance on a five-point DAFOR scale (Dominant, Abundant, Frequent, Occasional, Rare).

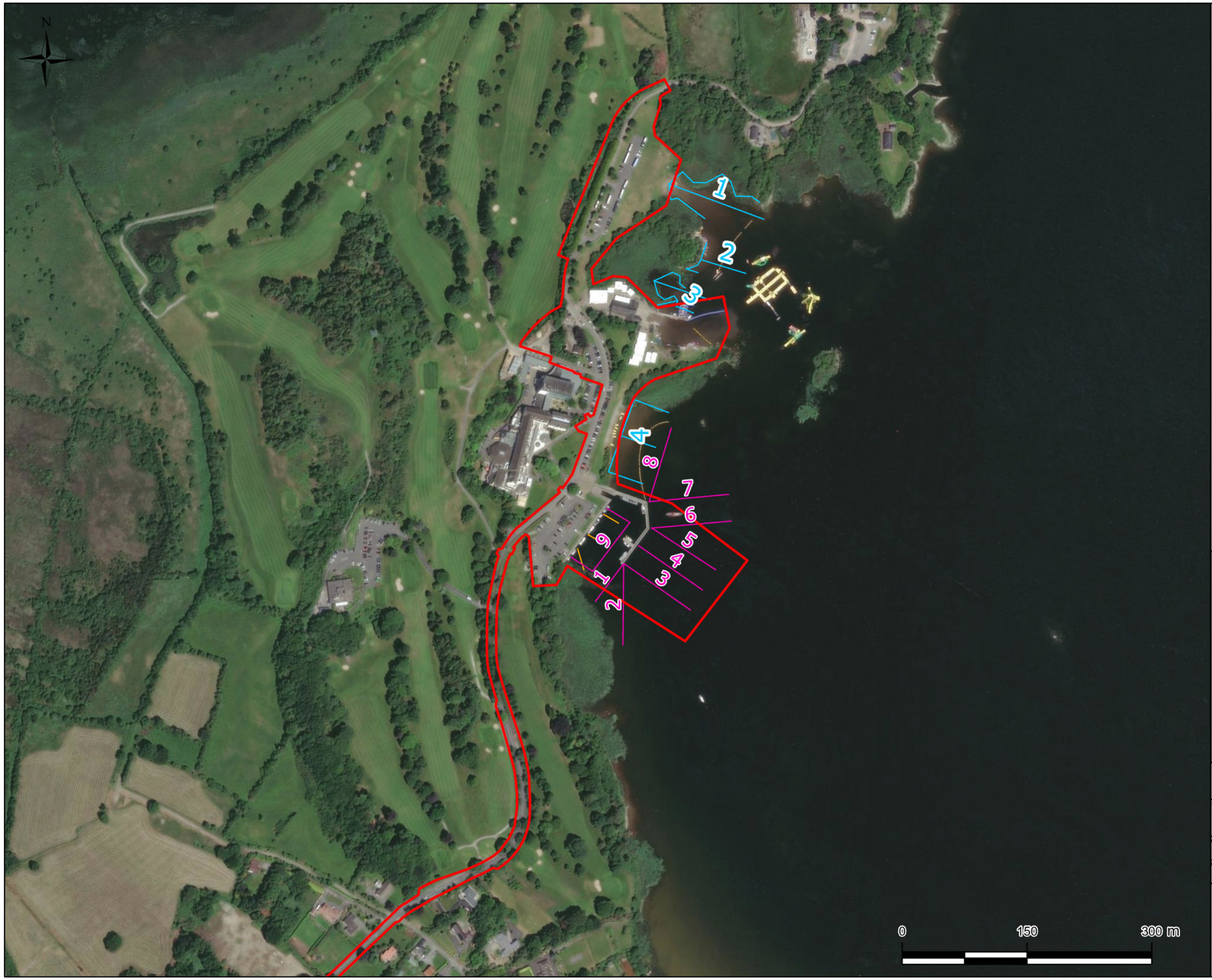
Initial wading and grapnel trawl surveys conducted on 16th July 2025 provided an understanding of the baseline and informed further aquatic drone survey transects on 28th July 2025.

The habitat assessment surveys described in this report have been undertaken with reference to the following guidelines:

- Commission of the European Communities (2013) *Interpretation manual of European Union habitats*. Eur 28. European Commission DG Environment.
- *NPWS (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.* Edited by: Domhnall Finch, Aoife Delaney, Fionnuala O'Neill and Deirdre Lynn.

Macrophytes were identified using various botanical keys and guides, including Inland Fisheries Ireland Aquatic Plants in Ireland a Photographic Guide (Caffrey, Matson & O'Briain, 2023).

Plant nomenclature for vascular plants follows '*New Flora of the British Isles*' (Stace, 2010).



Map Legend

- Proposed Development Site
- Wading Macrophyte Transects
- Grapnel Throw
- Aquatic Drone Transects

Spatial Reference
Name: IRENET95 Irish Transverse Mercator
Datum: IRENET95
Projection: Transverse Mercator

SITE LOCATION - NOT TO SCALE

Drawing Title
Location of macrophyte transect surveys

Project Title
Hodson Bay Waterfront Park and Marina Redevelopment, Co. Roscommon

Project No.	Drawing No.	Scale
241220	Figure 2-1	1:8,000
Drawn By	Checked By	Date
BOC	AvdGM	11/08/2026

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3. SURVEY RESULTS

3.1 Wading transect surveys

3.1.1 Wading Macrophyte survey - transect 1

Wading Macrophyte transect 1 was conducted through the northern-most bay, partially within the Proposed Development Site. Macrophyte assemblage up to 20 m perpendicular to the shoreline consisted of ***Occasional*** patches of pondweeds (including Long-leaved Pondweed *(Potamogeton lucens x gramineus = P. x angustifolius),* Small pondweed *(Potamogeton berchtoldii),* Shining Pondweed *(Potamogeton lucens)* and perfoliate pondweed *(Potamogeton perfoliate)* and the Third Scheduled Invasive species Nuttall's waterweed *(Elodea nutallii),* among otherwise bare silt and sand based lake bed substrates (Plate 3-1)

More dense patches of an assemblage of the above pondweed species were recorded in more ***Frequent*** density from approx. 65 m perpendicular to the shoreline, as well as ***Occasional*** spiked water-milfoil *(Myriophyllum spicatum)* and ***Rare*** patches of delicate stonewort *(Chara virgata)* and greater water-moss *(Fontinalis antipyretica)* (Plate 3-2).

Reed and large sedge swamp (FS1) habitat bordered the central wading transect 1 to the north and south, with species throughout these dense habitats including reed-canary grass *(Phalaris arundinacea)* and common reed *(Phragmites australis),* both recorded as ***Dominant***, with unbranched bur-reed *(Sparganium emersum)* and arrowhead *(Sagittaria sagittifolia),* both recorded as ***Frequent***, found below the waterline on the border of this habitat. Common club-rush (Schoenoplectus lacustris) was also recorded as ***Abundant*** throughout stands of common reed and reed-canary grass. Other species which were recorded as ***Occasional*** included common spike-rush *(Eleocharis palustris)*, yellow water lily *(Nuphar lutea)*, water horsetail *(Equisetum fluviatile). Cladophora sp.* algae was present throughout macrophytes in open water and around reedbeds.

Along the outcrop of land on the northern side of the transect, marginal species recorded along the shoreline included amphibious bistort *(Persicaria amphibia)*, water-plantain *(Alisma plantago-aquatica),* water germander *(Teucrium scordium)*, water mint *(Mentha aquatica)*, marsh pennywort *(Hydrocotyle vulgaris)*, shoreweed *(Littorella uniflora)* Lesser spearwort *(Ranunculus flammula)*, purple loosestrife *(Lythrum salicaria)*, sneezewort *(Achillea ptarmica),* hemp agrimony *(Eupatorium cannabinum),* tufted vetch *(Vicia cracca)* and marsh horsetail *(Equisetum palustre).*

Encrusted deposits of quagga and zebra mussel were present intermittently along the lakebed throughout wading transect 1 (Plate 3-5).

Plate 3-1. A representative photo of sparse macrophyte coverage and silt and sand substrates throughout the first 65 m of wading macrophyte transect 1

Plate 3-2. A representative photo of denser macrophyte coverage from 65 m out in wading transect 1

*Plate 3-3. A representative photo of **Reed and large sedge swamp (FS1)** habitat dominated by common reed and reed-canary grass*

*Plate 3-4. A representative photo of common club-rush dominant sections of **Reed and large sedge swamp (FS1)** habitat along wading transect 1*

Plate 3-5. A representative photo of quagga and zebra mussel found along wading macrophyte transect 1

3.1.2 Wading Macrophyte survey - transect 2

Lakebed substrates at wading Macrophyte transect 2 was conducted partially within the Proposed Development Site and consisted of more cobble-based substrates. The wadable length of transect 2 was limited to 65 m from the shoreline due to prohibitive depths, with grapnel throws performed to approx. 20 m further out.

Between 5–65 m from the shoreline, macrophytes on the lakebed consisted of Nutall's waterweed ***(Dominant)***, long-leaved pondweed and perfoliate pondweed ***(Frequent)*** and small pondweed ***(Occasional)***, with beds of ***Frequent*** delicate stonewort (Plate 3-6).

Along the southern side of the transect, stands of **Reed and large sedge swamp (FS1)** consisting of common reed, reed-canary grass and common club-rush (all recorded as ***Dominant)*** were present continuously from the shoreline to 20 m perpendicular to the shoreline (Plate 3-8). Yellow water lily, unbranched bur-reed and arrowhead (all recorded as ***Frequent)*** were present along the margins between reedbeds and open water.

Grapnel throws from the limit of accessible depth (65 m from shoreline) showed further ***Dominant*** coverage of Nutall's waterweed and ***Frequent*** coverage of delicate stonewort.

Similar to wading transect 1, quagga and zebra mussel were present in encrusted formations on the lakebed throughout the transect.

Plate 3-6. A representative photo of cobble-dominant lakebed substrate at wading macrophyte transect 2

*Plate 3-7. A representative photo of areas of **Reed and large sedge swamp (FS1)** habitat along wading macrophyte transect 2*

Plate 3-8. A representative photo of common reed and reed-canary grass dominant reed beds along the southern side of wading macrophyte transect 2

3.1.3 Wading Macrophyte survey - transect 3

Wading Macrophyte transect 3 was conducted within the Proposed Development Site, located along the area of Lough Ree directly north of the Baysports facility. Lakebed substrate consisted of a mixture of sand and silt, as well as gravel and cobbles. Quagga and zebra mussel encrustations were observed throughout the transect. Within the bounds of the existing Baysports water sports facility, habitat consisted largely of areas of highly disturbed lakebed, with gravel, sand and silt substrates and little to no macrophyte coverage (Plate 3-9, Plate 3-10), with a fringing **Reed and large sedge swamp (FS1)** habitat bordering between the Baysports facility and adjacent bay (Plate 3-11).

As with transects 1 and 2, marginal and emergent macrophytes along both the northern and southern sides of the transect consisted of common reed, reed-canary grass (recorded as ***Dominant)*** and common club-rush (recorded as ***Abundant)*** from the beginning of the transect (0 m) to 50 m perpendicular to the start point (Plate 3-12). Yellow water lily was recorded as ***Frequent*** along areas of reed bed (Plate 3-13). Arrowhead and unbranched bur-reed were also recorded as ***Frequent*** along the northern margin of the transect, with lesser water plantain *(Baldellia ranunculoides)* recorded as ***Occasional.*** Filamentous green algae (FGA) was found throughout reed beds along the transect.

Through the centre of the transect up to 70 m (the limit of wadable depth at the time of survey), Nuttall's waterweed ***(Dominant)***, perfoliate pondweed and delicate stonewort ***(Frequent)*** and small pondweed ***(Occasional)*** were recorded during wading, as well as beyond the 70 m via grapnel throw (Plate 3-14) Throughout *Chara* beds were recorded within the first 45 m of wading transect 3, shoreweed was recorded approx. 30 m from the beginning of the transect.

Plate 3-9. A representative photo of lakebed substrate in areas with high levels of existing disturbance within the Baysports Facility

Plate 3-10. A representative photo of lakebed substrate in areas with high levels of existing disturbance within the Baysports Facility

Plate 3-11. A representative photo of bordering ***Reed and large sedge swamp (FS1)*** *habitat between the Baysports facility and northern bay*

Plate 3-12. A representative photo of the centre of wading macrophyte transect 3

Plate 3-13. A representative photo of yellow water lily present throughout macrophyte transect 3

Plate 3-14. A representative photo of charophyte beds with pondweed sp. and Nuttall's pondweed throughout

3.1.4 Wading Macrophyte survey - transect 4

Wading macrophyte transect 4 was conducted from the shoreline directly north of the existing marina, partially within the Proposed Development Site. Lakebeds substrates were primarily composed of silt and sand, similar to wading transect 1. However, macrophyte coverage on the lakebed was denser, although still patchy. Macrophytes recorded as ***Frequent*** up to 70 m from the shoreline (the limit of wadable depth) included delicate stonewort, long-leaved pondweed and perfoliate pondweed. Nuttall's pondweed was recorded as ***Abundant,*** particularly in areas of deeper water along the northern side of the existing marina. Fennel-leaf pondweed *(Stuckenia pectinata)* was also recorded as ***Frequent*** throughout the bay in wading transect 4. Much of the submerged macrophytes in wading transect 4 were overlain with siltation (Plate 3-15, Plate 3-16, Plate 3-17).

Along the northern side of the bay, **Reed and large sedge swamp (FS1)** habitat extended up to 60 m perpendicular to the shoreline and consisted of common reed and reed-canary grass ***(Dominant)***, common club-rush ***(Frequent)*** and bulrush *(Typha latifola,* ***Occasional).*** Plants recorded marginally and emergently along the shoreline included water mint ***(Occasional)*** and horsetail *(Equisetum sp.,* ***Rare****),* common spike-rush ***(Rare)*** and lesser spearwort *(Ranunculus flammula,* ***Rare)***

Plate 3-15. A representative image of the bay in which wading macrophyte transect 4 was conducted

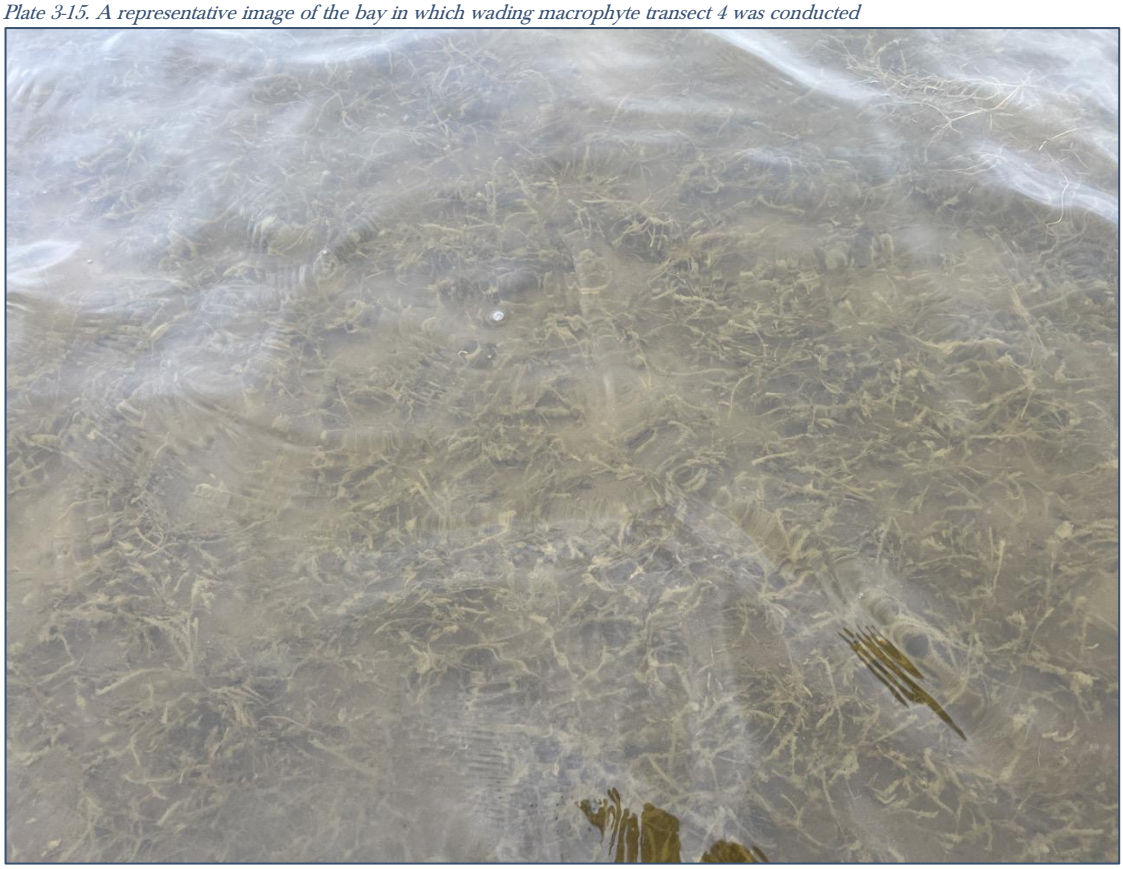

Plate 3-16. A representative image of continuous but patchy macrophyte coverage at wading transect 4

Plate 3-17. A representative photo of Fennel-leaf pondweed identified throughout wading transect 4

*Plate 3-18. A representative photo of **Reed and large sedge swamp (FS1)** habitat located along the northern side of wading macrophyte transect 4*

Plate 3-19. A representative photo of vegetation assemblage on the shoreline, including common-club rush and common spike-rush

3.1.5 Grapnel Macrophyte survey - transect 5

Due to prohibitive depths in the vicinity of the existing marina, grapnel throw surveys were conducted a 2 no. points within the marina and one along the southern-most reed beds, both within the Proposed Development Site. **Reed and large sedge swamp (FS1)** habitat consisting of common reed and reed-canary grass ***(both recorded as Dominant)*** extend up to 125 m from the front of the existing marina. Yellow water lily was recorded as ***Occasional*** along the southern reed beds.

Canadian waterweed *(Elodea Canadensis)* and Nuttall's waterweed were ***Dominant*** throughout the marina, in conjunction with Ivy-leaved duckweed *(Lemna triscula)* recorded as ***Abundant.*** The invasive species starry stonewort *(Nitellopsis obtusa)* was also recorded as ***Abundant*** throughout the marina. Perfoliate pondweed and greater water-moss were recorded as ***Frequent*** in areas of grapnel throw survey (Plate 3-20, Plate 3-21).

Plate 3-20. A representative photo of the prohibitively deep water in the vicinity of the existing marina

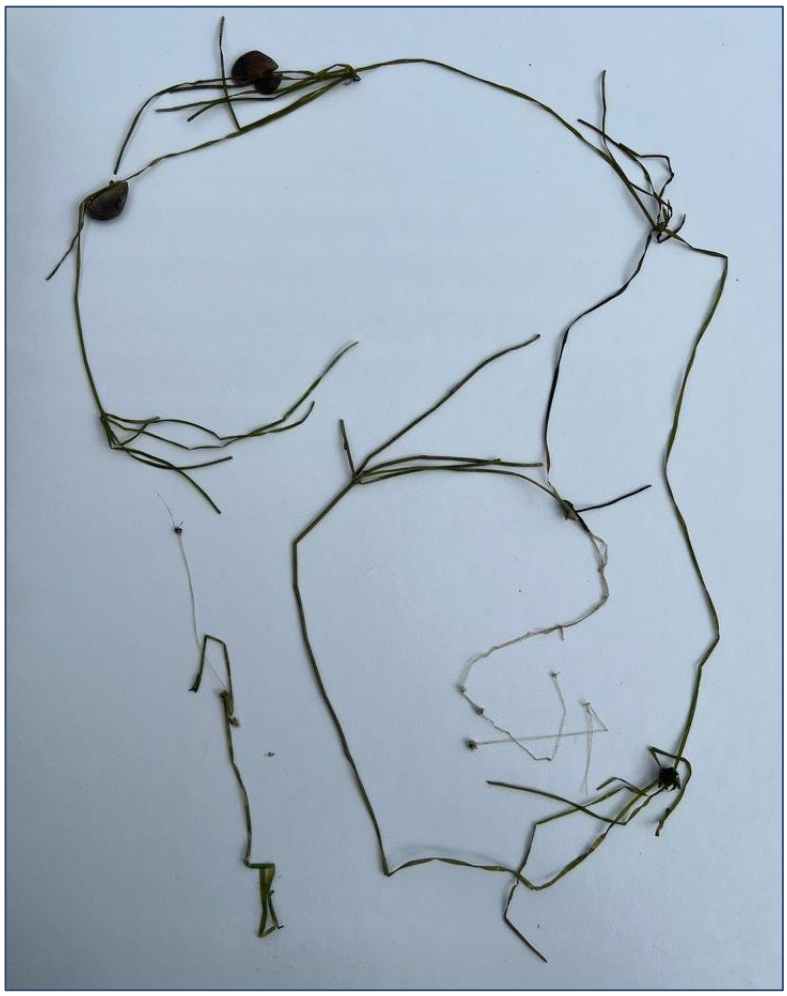

Plate 3-21. A representative photo of the invasive species starry stonewort (Nitellopsis obtusa) found during macrophyte grapnel throws within the existing marina

3.2 Aquatic Drone transect surveys

3.2.1 Aquatic drone - transect 1

Aquatic drone transect 1 was conducted from the end of the marina, moving approx. 55 m southwest toward the reed beds south of the marina. Aquatic drone transect 1 was conducted partially within the Proposed Development Site. Lakebed substrates consisted primarily of silt and sand-based substrates, with continuous, patchy coverage of Nuttall's waterweed and Canadian waterweed recorded as ***Dominant***, in conjunction with ivy-leaved duckweed recorded as ***Abundant***, up to 2.2m deep throughout the transect (Plate 3-22).

The invasive species starry stonewort was recorded as ***Abundant*** along the lakebed throughout much of the transect. Juvenile quagga mussels were frequently found in association with starry stonewort (Plate 3-23), with encrustations of zebra and quagga mussel along the lakebed throughout aquatic drone transect one. In areas of shallower water toward the reedbeds, underwater leaves of arrowhead and yellow water lily were also observed, both recorded as ***Occasional***, while shining and perfoliate pondweed were recorded as ***Frequent*** on the margins of reedbeds to the south (Plate 3-24).

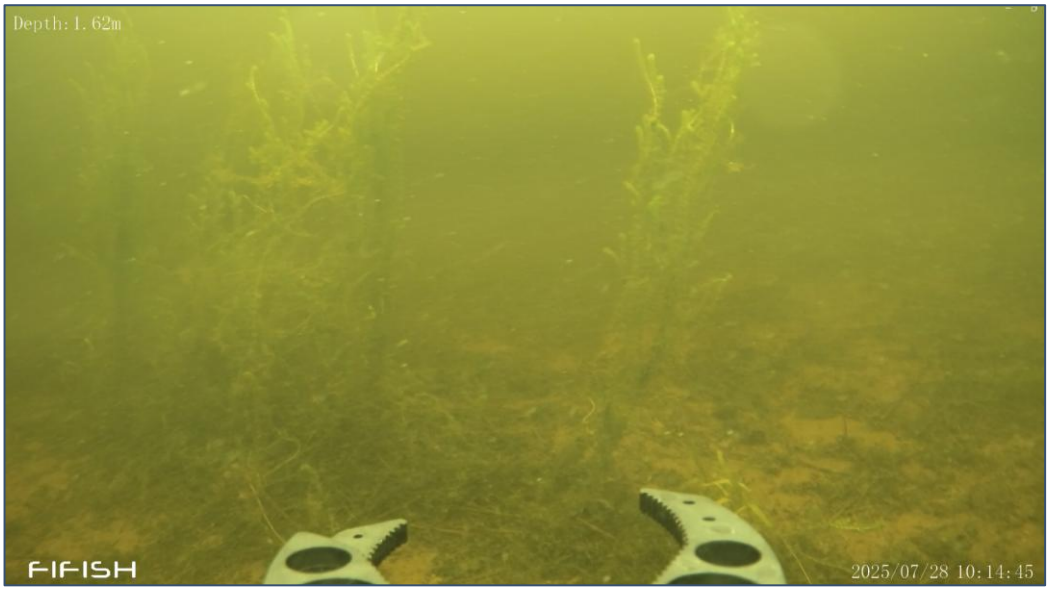

Plate 3-22. A representative photo taken via aquatic drone of Canadian and Nuttall's waterweed throughout aquatic drone transect 1

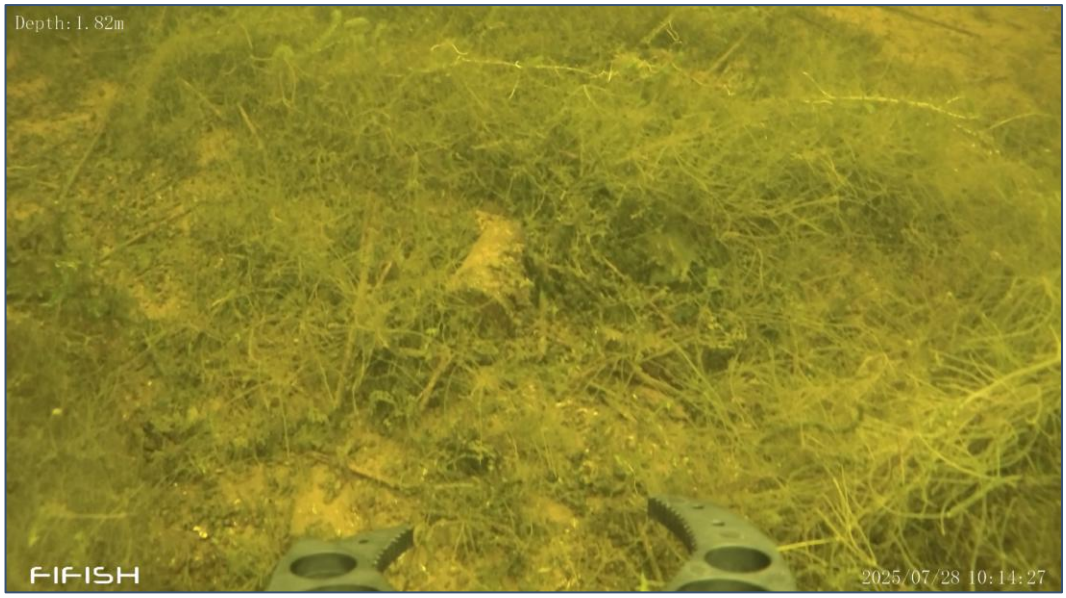

Plate 3-23. A representative photo taken via aquatic drone of the lakebed, dominated by starry stonewort, Canadian waterweed and Nuttall's waterweed

Plate 3-24. A representative photo of aquatic drone transect 1 from the marina

3.2.2 Aquatic drone - transect 2

Aquatic drone transect 2 was conducted from the end of the marina, moving approx. 90 m south from the corner of the marina. Aquatic drone transect 2 was conducted partially within the Proposed Development Site. Similar to aquatic drone transect 1, lakebed substrates consisted primarily of silt and sand-based substrates, with continuous, patchy coverage of Nuttall's waterweed and Canadian waterweed both recorded as ***Dominant***, in conjunction with ivy-leaved duckweed, recorded as ***Abundant***, greater water moss, recorded as ***Frequent***, up to 2.1m deep throughout the transect. Moving toward the end of the transect, underwater leaves of yellow water lily and common club-rush, both recorded as ***Frequent,*** and arrowhead, recorded as ***Occasional*** were noted. Perfoliate pondweed was recorded as ***Abundant,*** particularly toward the end of the transect (from approx. 58 m – 90 m) (Plate 3-25).

Charophyte beds were present throughout beds of Nutall's and Canadian waterweed from approx. 25 m along the transect, up to 1.85 m deep semi-continuously along the transect. *Chara* species consisted

of delicate stonewort (recorded as ***Frequent)*** but was dominated by the non-native species starry stonewort, which was recorded as ***Abundant*** (Plate 3-26). Plate 3-27 shows a representative photo of the location of aquatic drone transect 2.

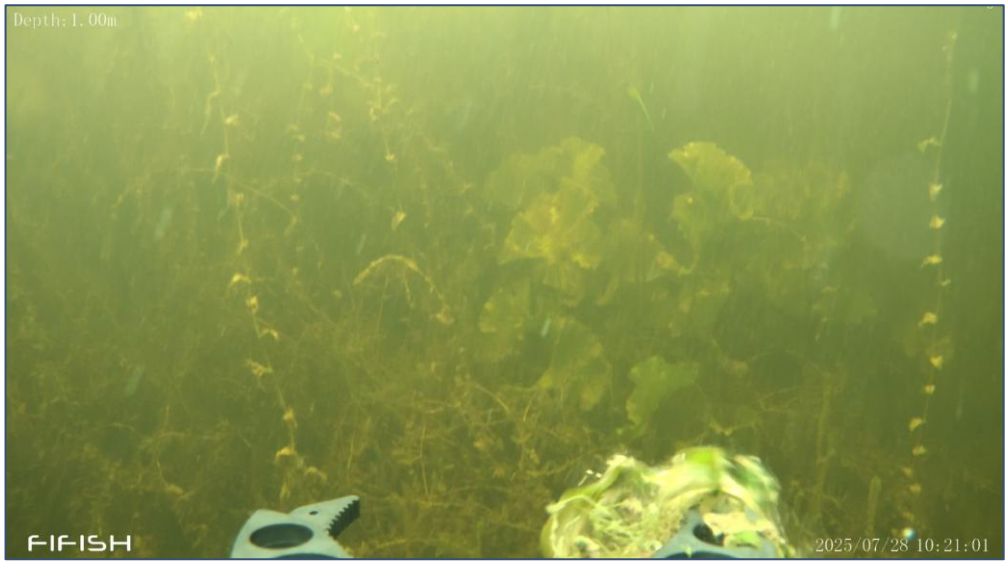

Plate 3-25. A representative photo of species recorded along aquatic drone transect 2, including pondweed, yellow water lily and charophytes

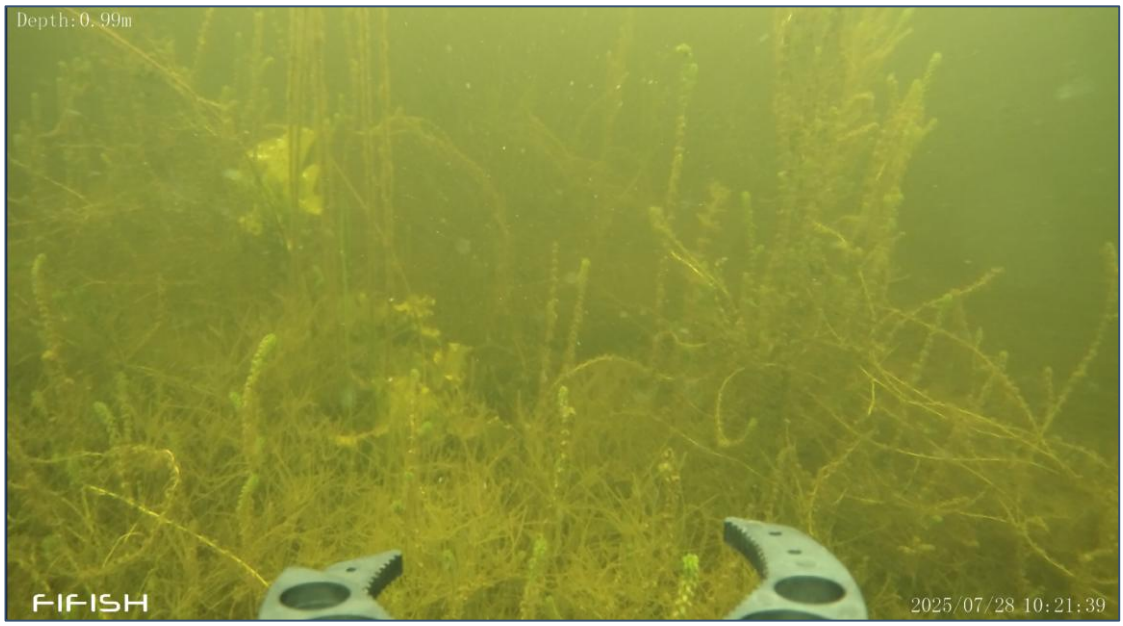

Plate 3-26. A representative photo of areas of Elodea spp. beds, with charophytes throughout

Plate 3-27. A representative photo of aquatic drone transect 2 from the marina

3.2.3 Aquatic drone - transect 3

Aquatic drone transect 3 was conducted from the end of the marina, moving approx. 90 m southeast from the southern corner of the marina. Aquatic drone transect 3 was conducted partially within the Proposed Development Site. Lakebed substrates along this transect consisted primarily of silt and sand, with encrustations of quagga and zebra mussel noted, particularly in the first 20 m of the transect. High levels of siltation were evident along aquatic drone transect 3 in the vicinity of the existing marina.

Macrophyte coverage was sparse in the first 20 m of the transect. Sparse macrophytes observed were recorded as follow: charophytes (***Rare*** delicate stonewort and non-native starry stonewort), ***Frequent*** *Cladophora sp.* and ***Occasional*** perfoliate pondweed and Nuttall's waterweed. Underwater leaves of arrowhead were also noted, recorded as ***Rare*** (Plate 3-28). Fly tipping was frequent extending from the front of the existing marina.

From approx. 30 m along the transect, pondweed beds, dominated by perfoliate pondweed, densely vegetated the lakebed (recorded as ***Abundant).*** Moving further out along the transect toward open water, vegetation coverage transition to charophyte beds with ***Abundant*** delicate stonewort and non-native native starry stonewort, ***Occasional*** common stonewort *(Chara vulgaris)* and ***Frequent*** perfoliate pondweed throughout. Charophyte beds featured ***Abundant*** *Cladophora sp.* throughout.

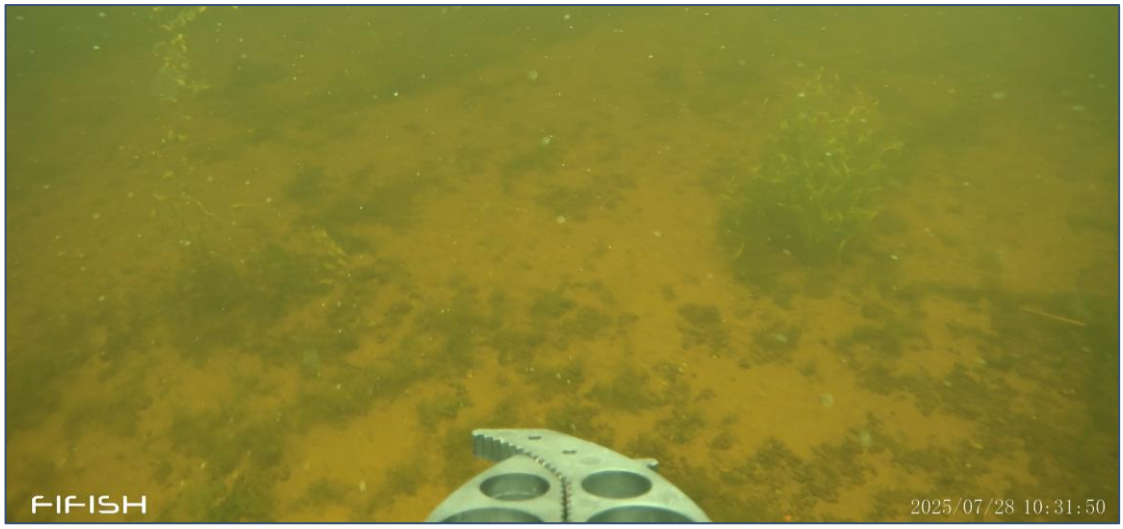

Plate 3-28. A representative photo of the sparsely vegetated initial sections of aquatic drone transect 3

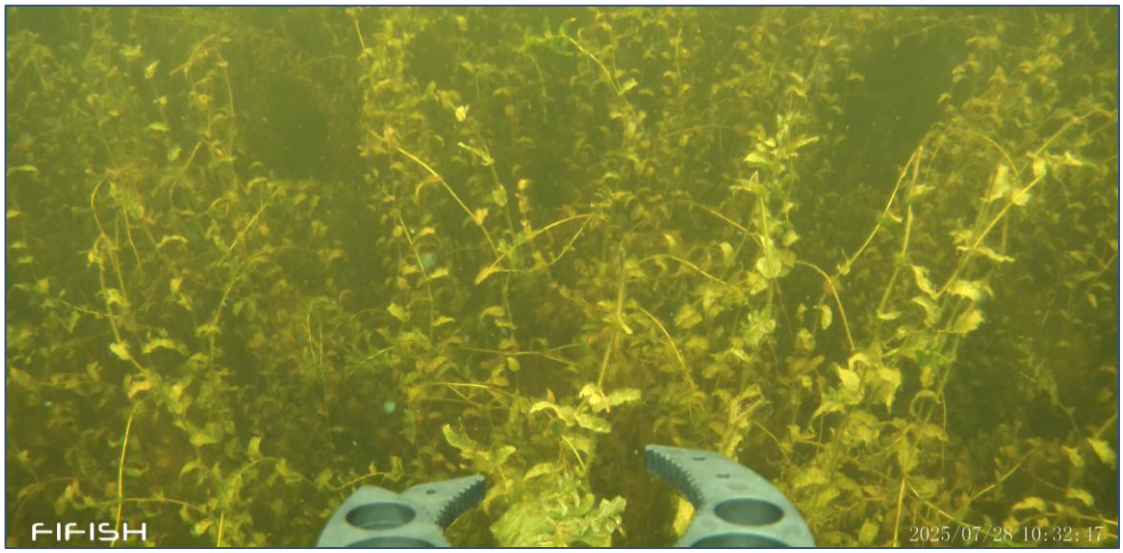

Plate 3-29. A representative photo of pondweed-dominant areas of lakebed along aquatic drone transect 3

Plate 3-30. A representative photo of charophyte beds toward the end of aquatic drone transect 3

Plate 3-31. A representative photo of the location of aquatic drone transect 3

3.2.4 Aquatic drone - transect 4

Aquatic drone transect 4 was conducted from the middle of the outer walkover of the existing marina, moving approx. 90 m southeast from the front of the marina. Aquatic drone transect 4 was conducted within the Proposed Development Site. The macrophyte assemblage, coverage and structure throughout aquatic drone transect 4 was aligned with that found along aquatic drone transect 3. Similar to aquatic drone transect 3, high levels of siltation were evident along aquatic drone transect 4 in the vicinity of the existing marina and extending out into open water.

Lakebed substrates along this transect again consisted primarily of silt and sand, with encrustations of quagga and zebra mussel noted, particularly in the first 20 m of the transect, grading into charophyte ***Dominant*** beds at up to 2 m deep, featuring delicate stonewort, common stonewort and the non-native stonewort (Plate 3-32). From approx. 65 m out along the transect, pondweed beds, dominated by perfoliate pondweed ***(Dominant)*** were present and also featured Nuttall's waterweed ***(Frequent)*** and the aforementioned charophyte species throughout (recorded as ***Abundant*** throughout this section). *Cladophora sp.* was also present throughout pondweed beds, recorded as ***Abundant*** (Plate 3-33, Plate 3-34).

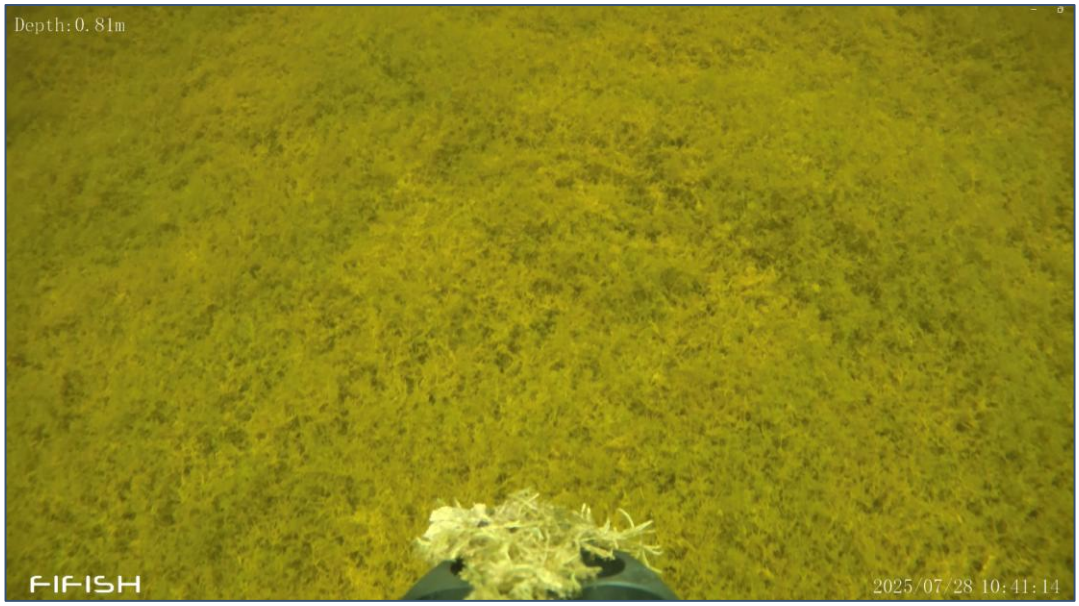

Plate 3-32. A representative photo of charophyte beds along aquatic drone transect 4

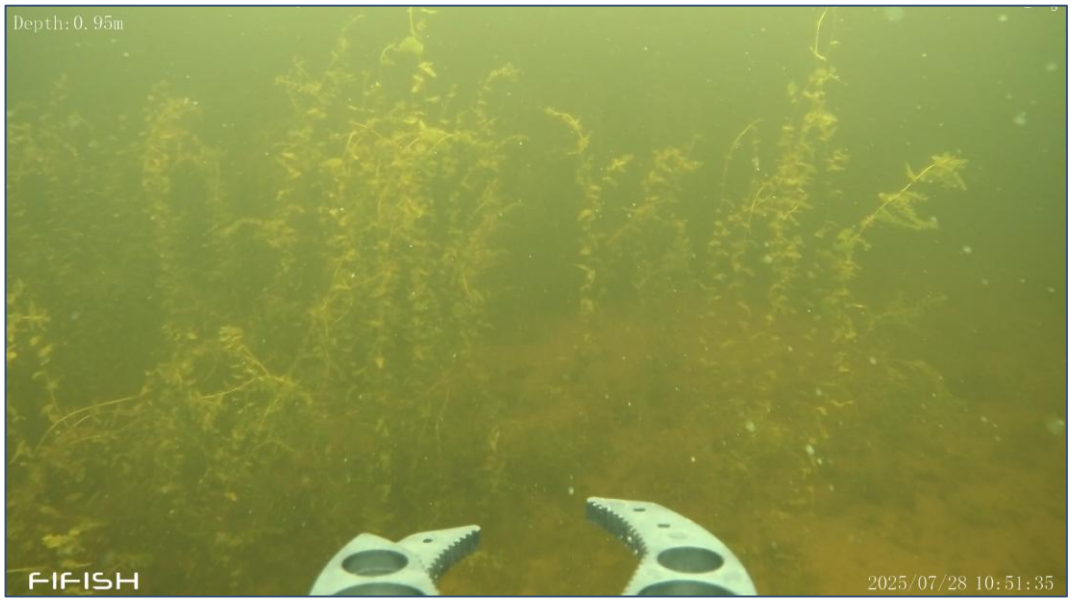

Plate 3-33. A representative photo of sparse areas of pondweed beds at the approximate halfway point of aquatic drone transect 4

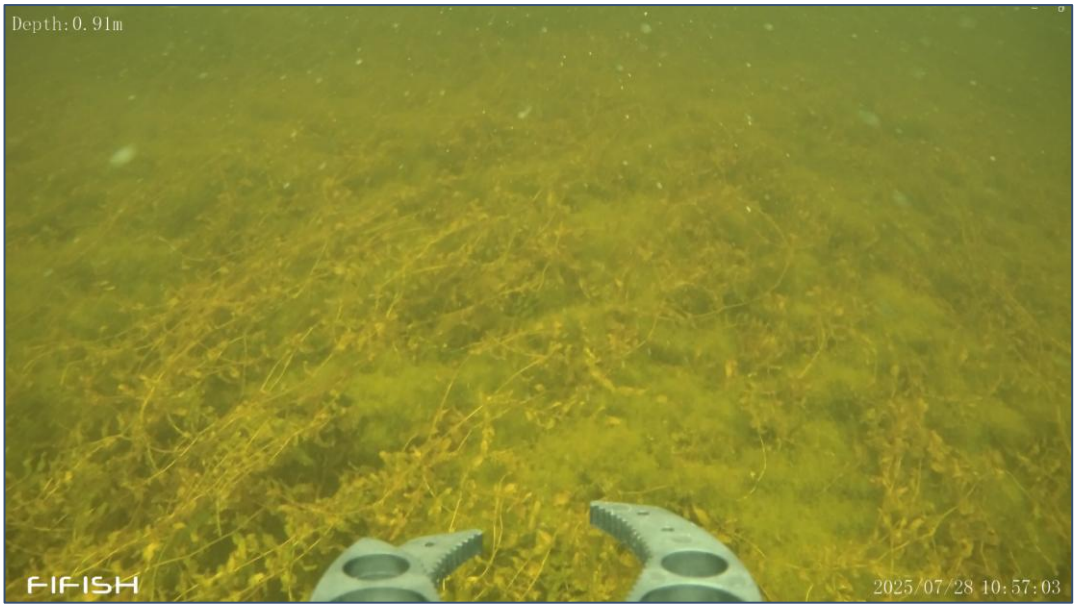

Plate 3-34. A representative photo of dense pondweed beds with Cladophora sp. throughout aquatic drone transect 4

3.2.5 Aquatic drone - transect 5

Aquatic drone transect 5 was conducted from the end of the outer walkover of the existing marina, moving approx. 90 m southeast from this point. Aquatic drone transect 5 was conducted within the Proposed Development Site. The macrophyte assemblage, coverage and structure throughout aquatic drone transect 5 was again aligned with that found along aquatic drone transects 3 and 4. Macrophytes were absent from within the first approx. 10 m of the transect, with sparse macrophyte coverage within the first 10–20 m of the transect. Quagga and zebra mussels were present on the lakebed and existing marina within transect 5, as well as transects 3 and 4. Fly tipping was present in the initial 1- m of this transect (Plate 3-35, Plate 3-36). Siltation was evident along the lakebed and throughout lakebed vegetation along the entire length of aquatic drone transect 5.

Moving from the marina out to open water, the underwater leaves of yellow water lily were present, recorded as ***Occasionally.*** Pondweed beds, featuring ***Abundant*** perfoliate pondweed and Nuttall's waterweed, were recorded from approx. 20 m out along the transect, with ***Occasional*** underwater leaves of arrowhead (Plate 3-37).

Pondweed-dominant beds became denser as the transect continued out to open water (densest at approx. 32 m, where lakebed depth was 2.3 m at the time of survey). Ivy-leaved duckweed and the non-native starry stonewort were present throughout pondweed beds, as well as ***Abundant*** *Cladophora sp.* (Plate 3-38).

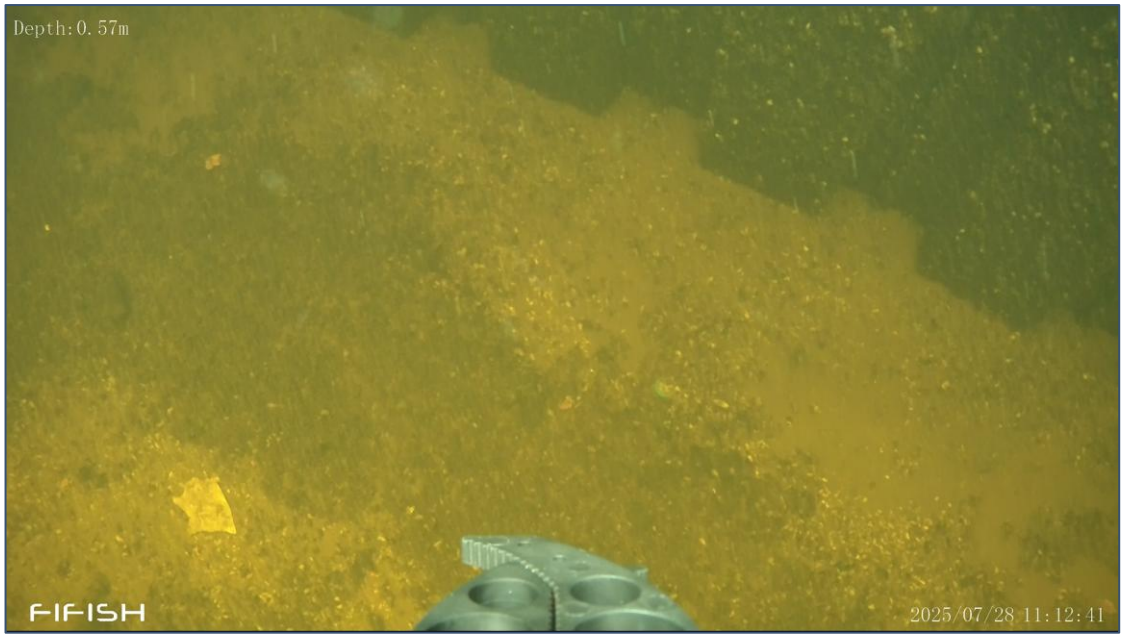

Plate 3-35. A representative photo of the lakebed within the first 5 m of aquatic drone transect 5

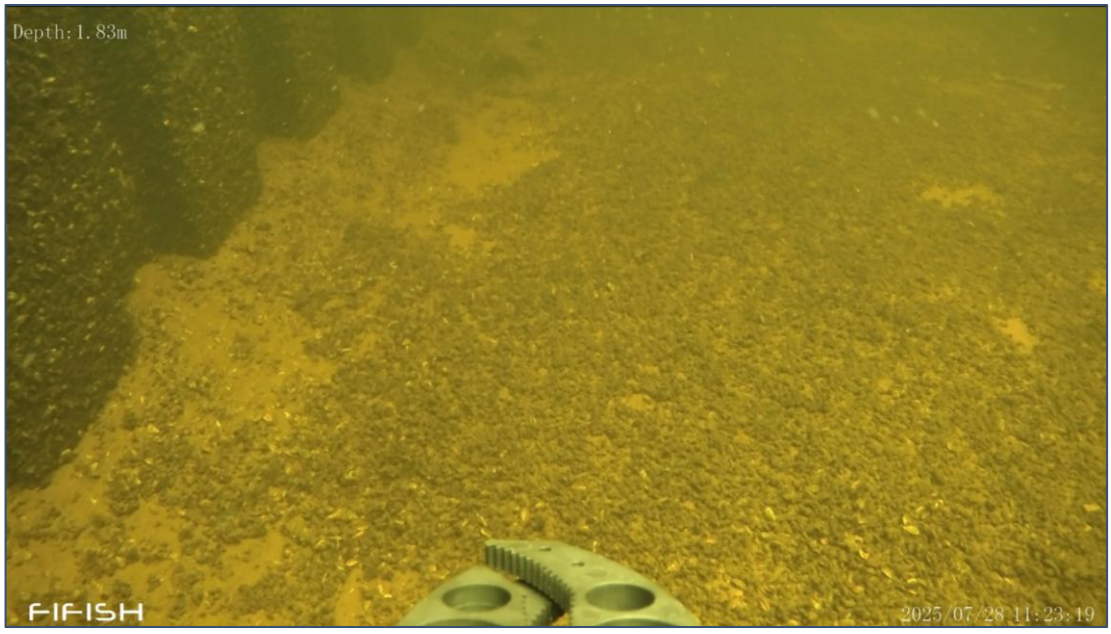

Plate 3-36. A representative photo of zebra and quagga mussel coverage on the lakebed and existing marina within the first 5 m of transect 5

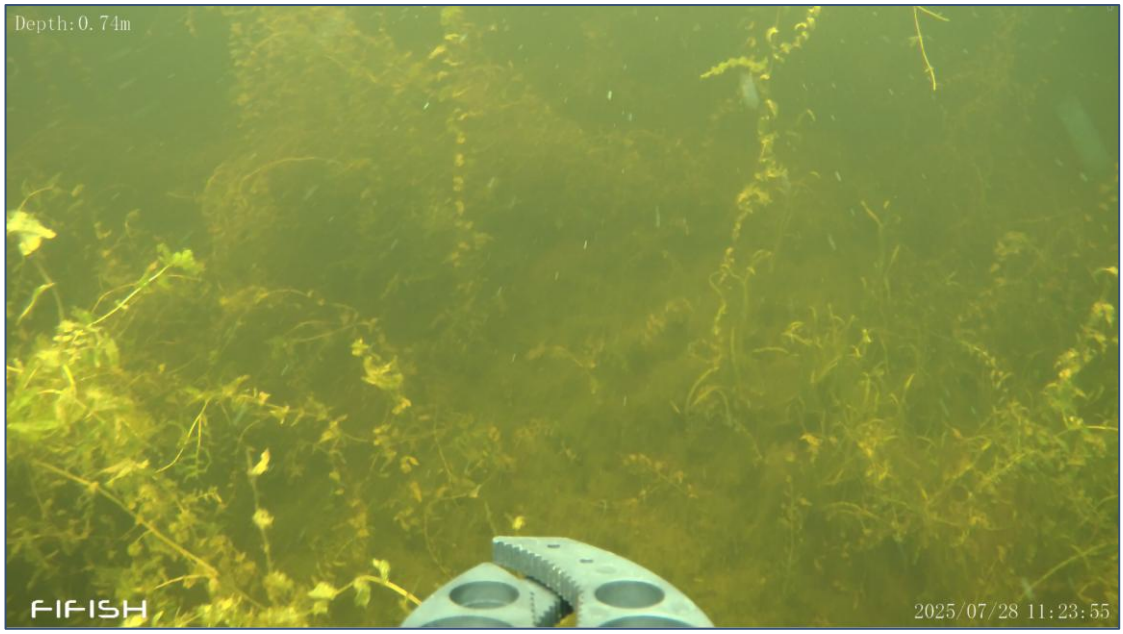

Plate 3-37. A representative photo of perfoliate pondweed with Nuttall's waterweed and underwater leaves of arrowhead

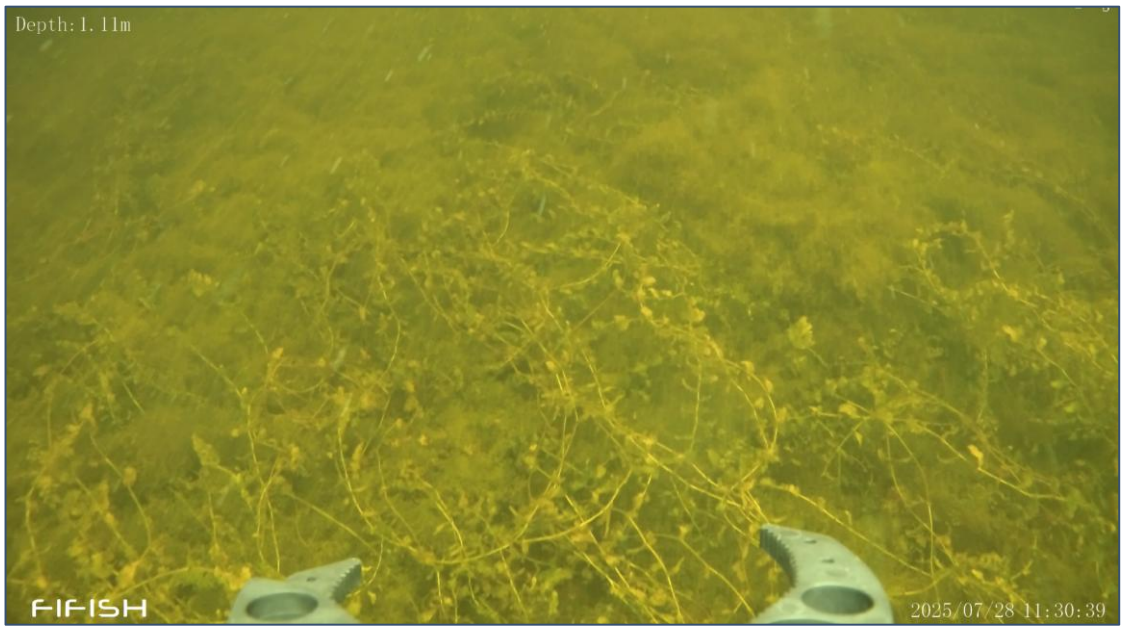

Plate 3-38. A representative photo of dense pondweed beds with charophytes and Cladophora sp. throughout

Plate 3-39. A representative photo of the open water in which aquatic drone transects 4 and 5 were conducted

3.2.6 Aquatic drone - transect 6

Aquatic drone transect 6 was conducted from the end of the outer walkover of the existing marina, moving approx. 90 m east from this point. Aquatic drone transect 6 was conducted partially within the Proposed Development Site. Similar to the aquatic drone transects 3, 4 and 5, the first 5 m of the transect consisted predominantly of sand and silt substrates, with dense quagga and zebra mussel coverage both on the marina and as encrustations on the lakebed.

At approx. 20 m along the transect, the lakebed was covered with dense mats of perfoliate pondweed, recorded as ***Dominant*** , with dense *Cladophora sp.* coverage throughout. Charophyte beds, consisting of delicate stonewort and the non-native starry stonewort (both recorded as ***Abundant)*** were present throughout pondweed growth from approx. 24 m along the transect, with stony starwort and *Cladophora sp.* becoming the dominant coverage beyond approx. 30 m. Nuttall's waterweed was present throughout charophytes from approx. 37 m along the transect (Plate 3-40, Plate 3-41). Arrowhead was identified throughout the transect, recorded as ***Frequent*** (Plate 3-43). Moving beyond approx. 43 m, starry stonewort became ***Dominant***, with perfoliate pondweed throughout, still recorded as ***Abundant.*** This coverage and species composition continued for much of the remainder of the transect (Plate 3-42, Plate 3-44).

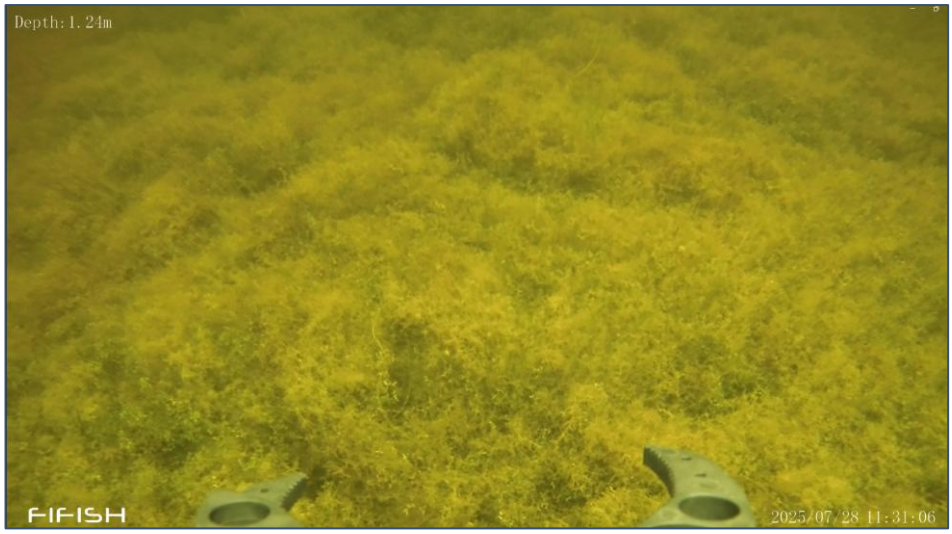

Plate 3-40. A representative photo of dense pondweed beds with Cladophora throughout.

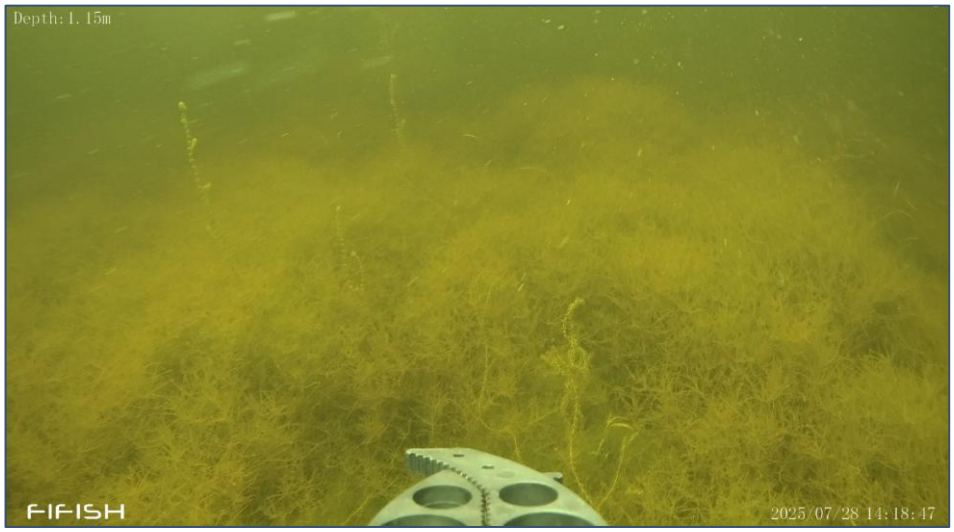

Plate 3-41. A representative photo Nuttall's waterweed present throughout dense mats of stony starwort and Cladophora sp., along aquatic drone transect 6

*Plate 3-42. A representative of **Abundant** non-native starry stonewort and underwater leaves of arrowhead throughout aquatic drone transect 6*

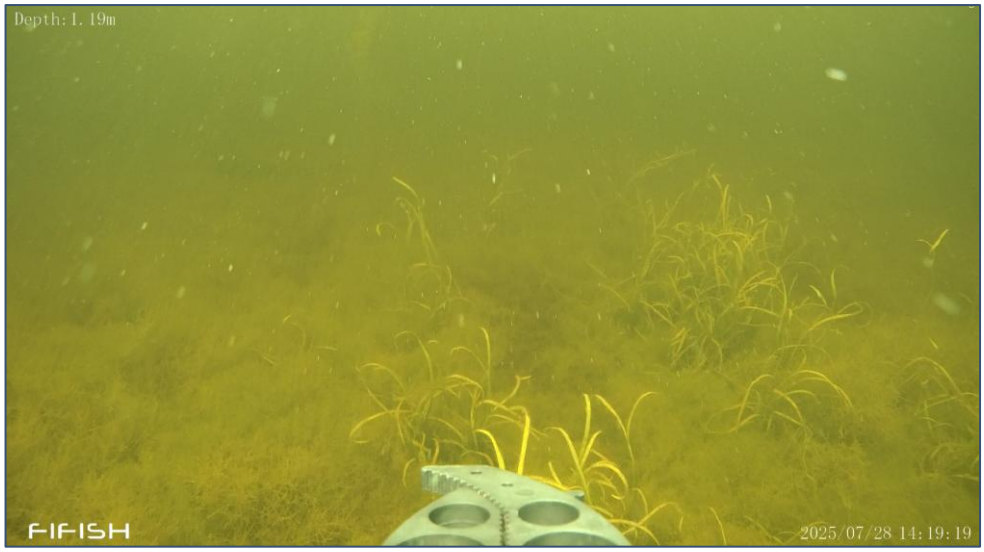

Plate 3-43. A representative photo of the underwater leaves of arrowhead throughout

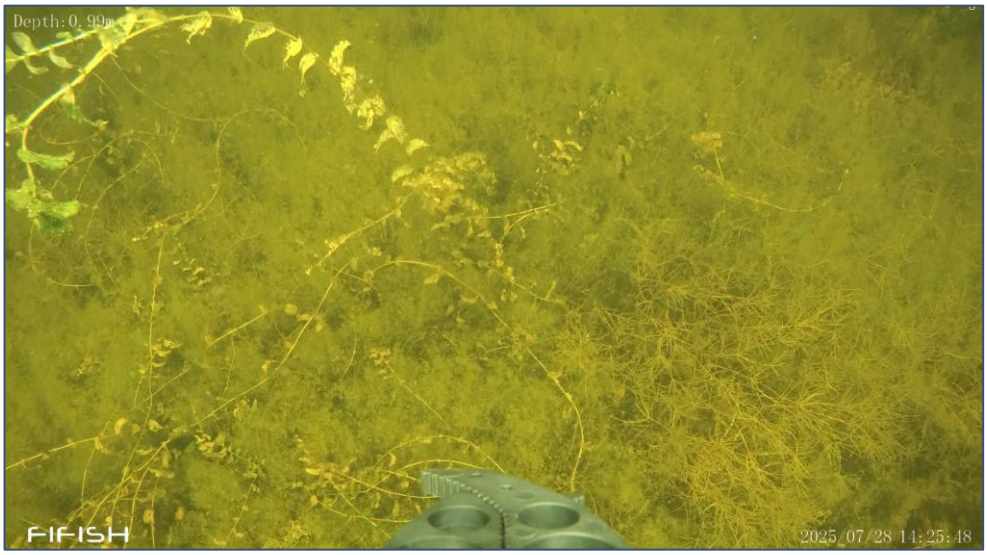

Plate 3-44. A representative photo of perfoliate pondweed and starry stonewort, with Cladophora sp. throughout

Plate 3-45. A representative photo of the location of aquatic drone transect 6

3.2.7 Aquatic drone - transect 7

Aquatic drone transect 7 was conducted from the northern corner of the marina, moving approx. 90 m northeast from this point. Aquatic drone transect 7 was conducted partially within the Proposed Development Site. The first 10 m of this transect consisted exclusively of silt, sand, gravel and zebra and quagga mussel, with patchy distribution of charophytes (Plate 3-45). As with drone transects 3 and 5, fly tipping was evident throughout aquatic drone transect 7 (Plate 3-46).

Between 10 m and 35 m along transect, lakebed macrophyte coverage consisted primarily of ***Abundant*** but patchy perfoliate pondweed coverage, with ivy leaved duckweed ***(Frequent)*** and *Cladophora sp.* ***(Abundant)*** throughout (Plate 3-48). Moving beyond 40 m to the end of the transect, the lakebed was covered by charophyte beds featuring ***Dominant*** starry stonewort and ***Frequent*** delicate stonewort (Plate 3-49).

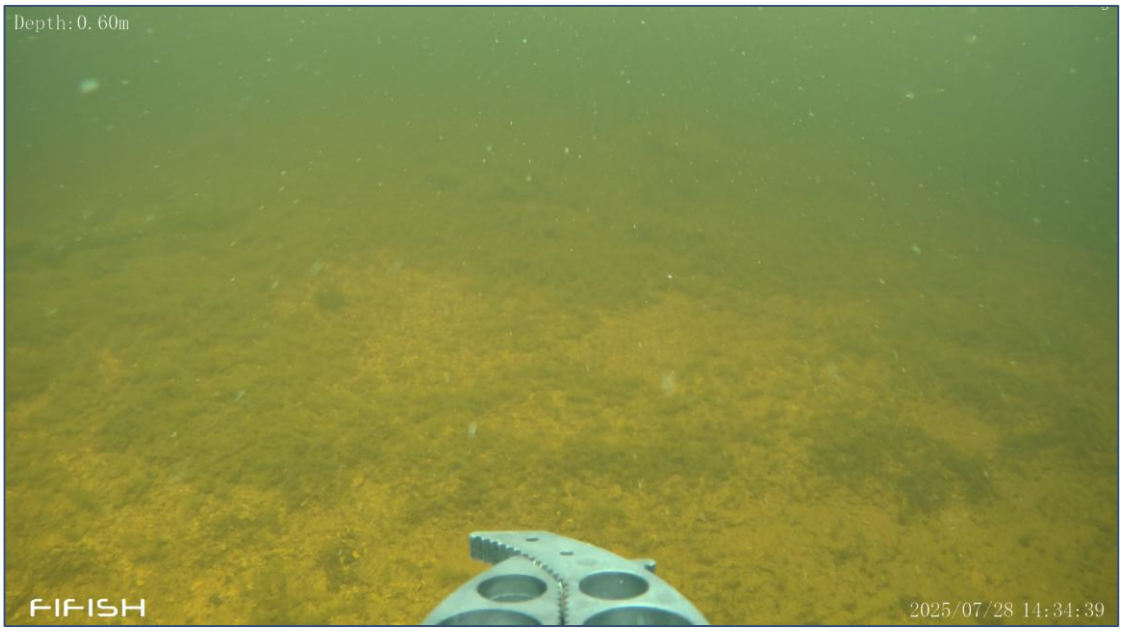

Plate 3-46. A representative photo of the first 10 m of aquatic drone transect 7

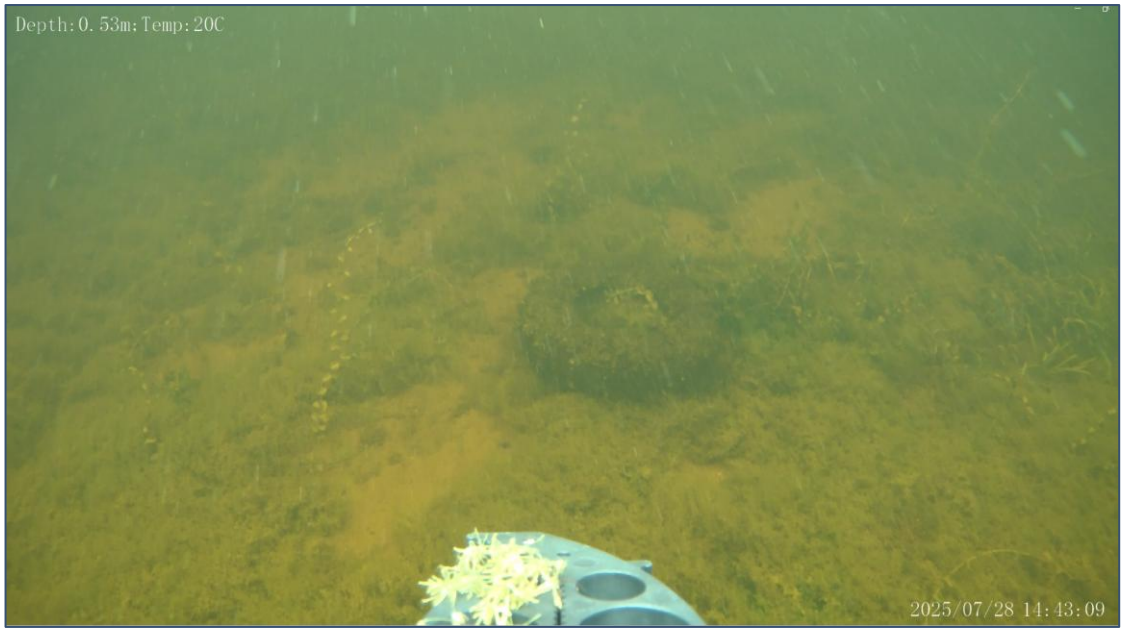

Plate 3-47. A representative photo of fly tipping present throughout aquatic drone transect 7

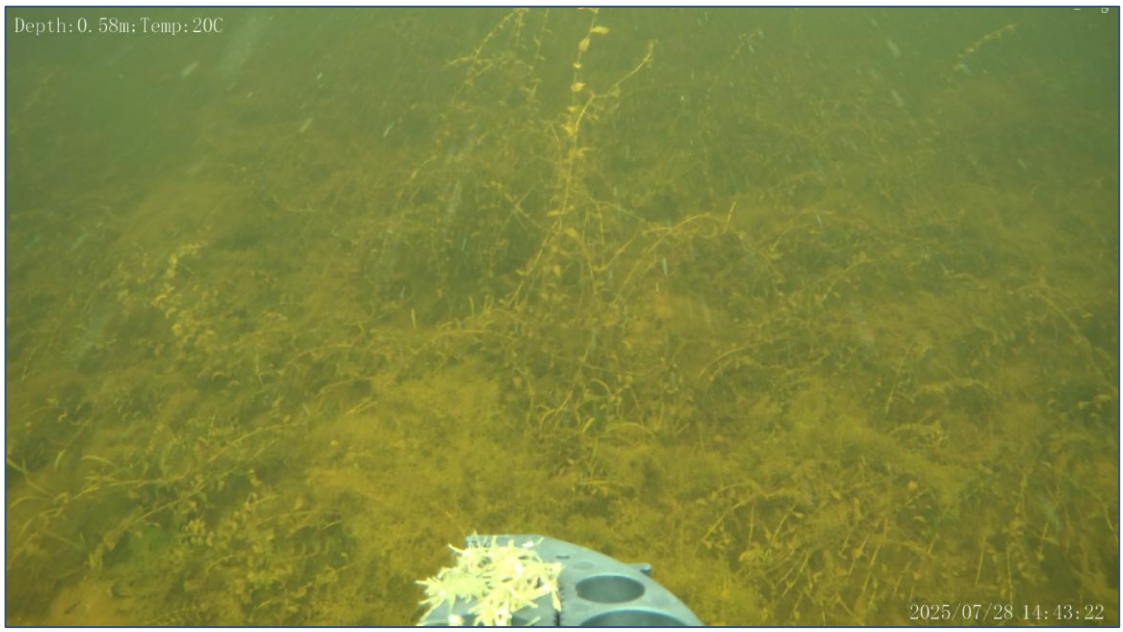

Plate 3-48. A representative photo of perfoliate pondweed with Cladophora throughout along aquatic drone transect 7

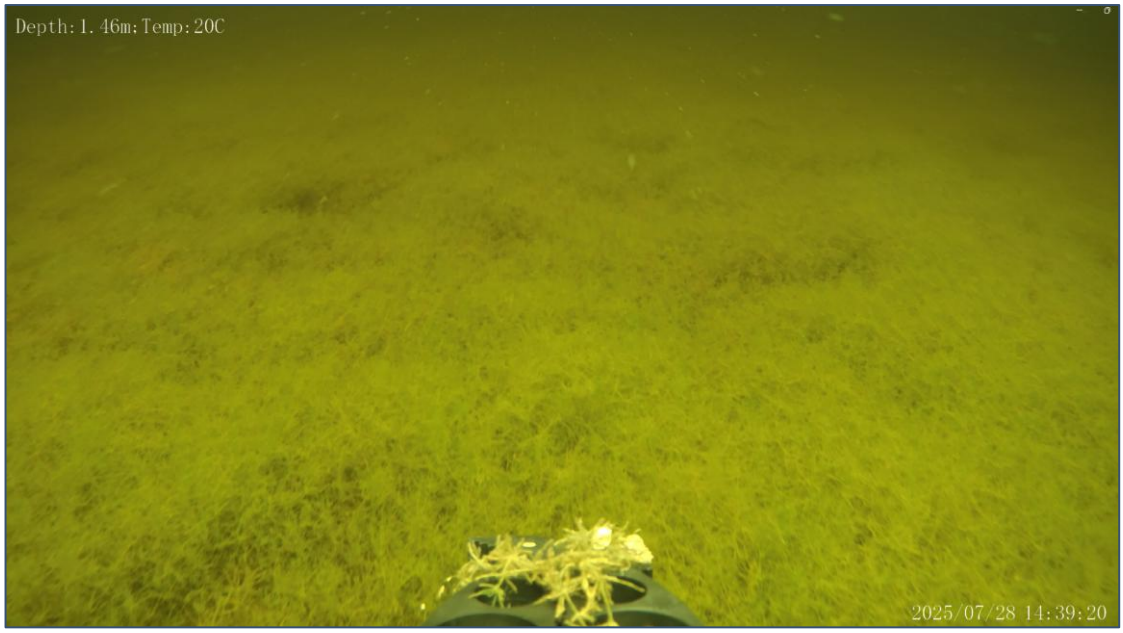

Plate 3-49. A representative photo of charophyte beds which dominated the lakebed from 40 m along aquatic drone transect 7

3.2.8 Aquatic drone – transect 8

Aquatic drone transect 8 was conducted from the first corner of the marina, moving approx. 90 m north-northeast from this point. Aquatic drone transect 8 was conducted partially within the Proposed Development Site. Similar to previous aquatic drone transects, the first 10 m of this transect consisted primarily of silt, sand, gravel, with zebra and quagga mussel and a patchy distribution of charophytes. Water depth was shallower throughout transect 8 as a result of the inlet across which the transect was conducted.

From approx. 12 m along the transect, continuous *Chara sp.* beds, including delicate stonewort and common stonewort ***(Abundant)***, as well as the non-native starry stonewort ***(Dominant).*** Large sediment deposits covered with quagga and zebra mussel were frequent throughout the transect, with ***Occasional*** underwater leaves of yellow water lily (Plate 3-50, Plate 3-51).

Moving further along the transect to the 50 m mark, spiked water milfoil ***(Abundant)***, perfoliate pondweed and Nuttall's waterweed (both ***Frequent)*** were present. Charophyte beds continued beyond the midpoint of the transect, with ***Abundant*** *Cladophora sp.* and starry stonewort throughout.

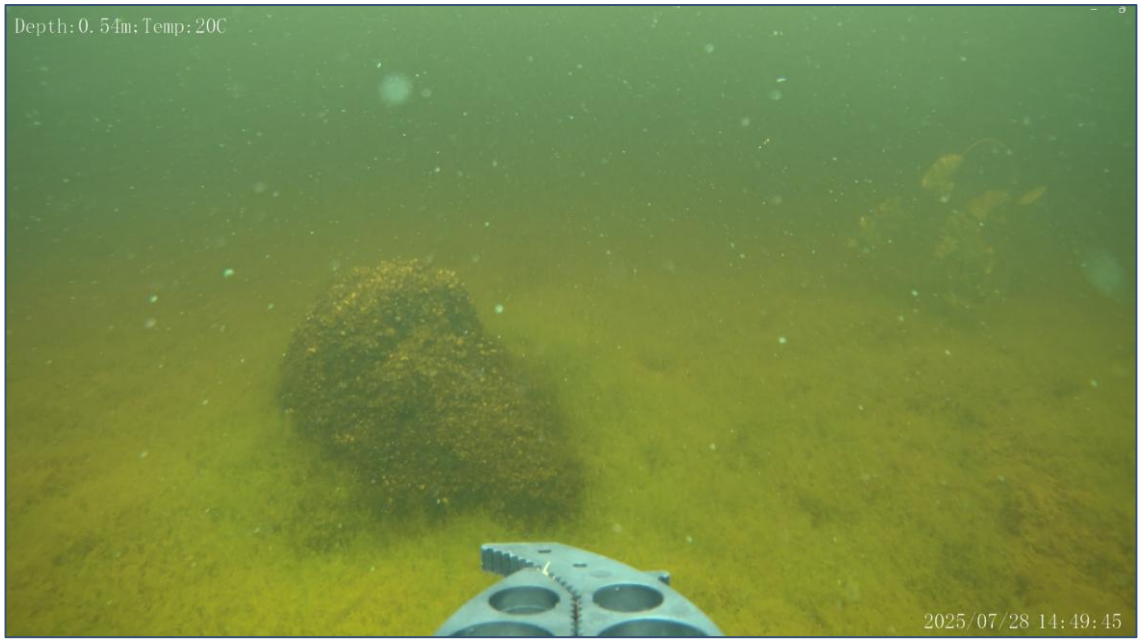

*Plate 3-50. A representative picture of quagga and zebra mussel deposits, **Occasional** underwater yellow water lily leaves and continuous charophyte beds*

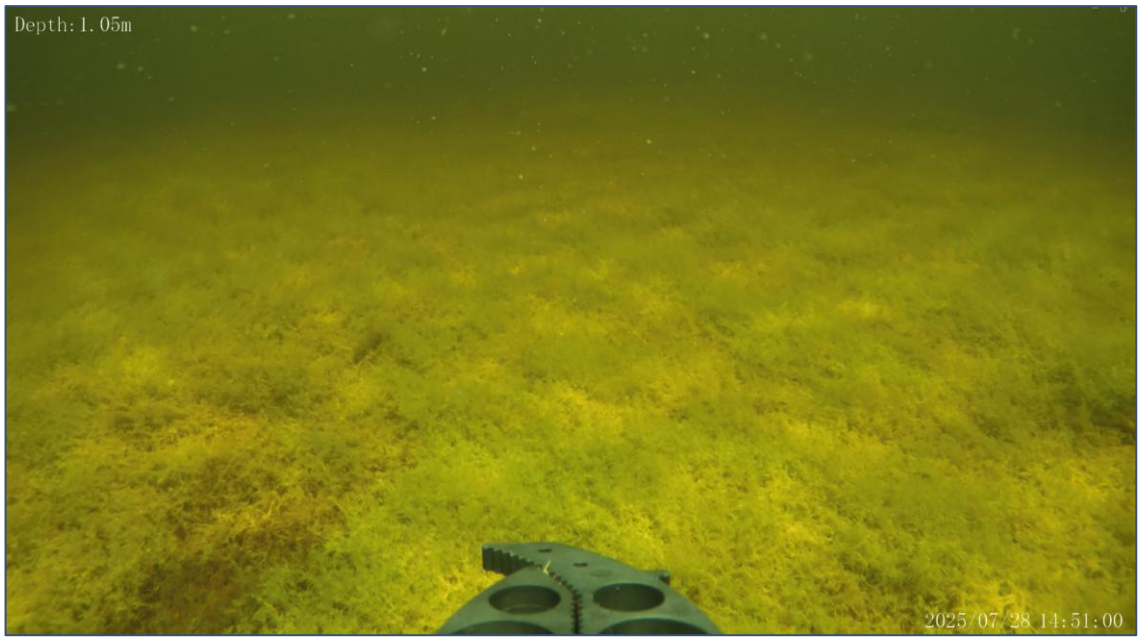

Plate 3-51. A representative photo of continuous charophyte beds throughout aquatic drone transect

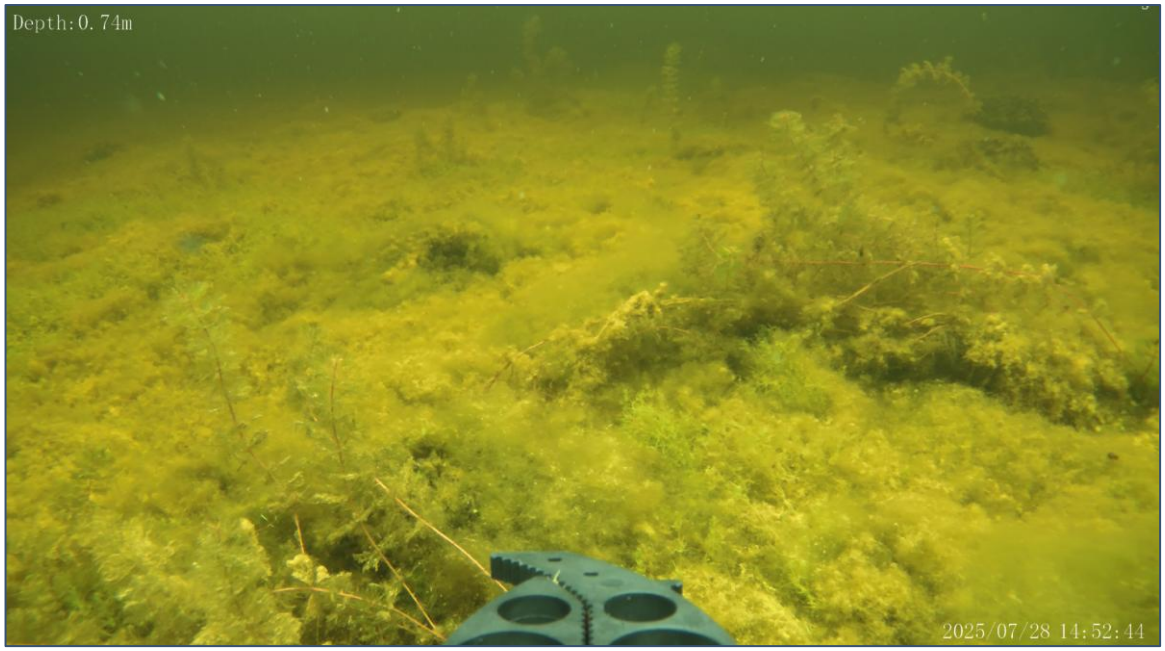

Plate 3-52. A representative photo of spiked water milfoil, perfoliate pondweed and charophytes beyond the midpoint of aquatic drone transect 8

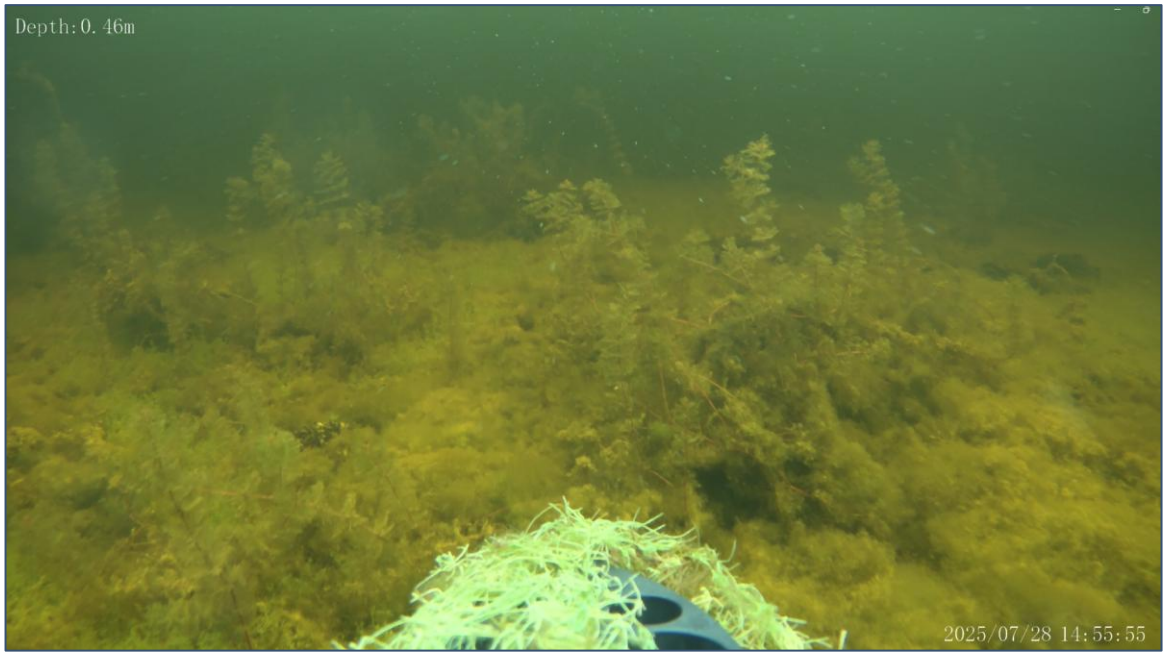

*Plate 3-53. A representative photo of a spiked water milfoil **Dominant** section of aquatic drone transect 8*

3.2.9 Aquatic drone - transect 9

Aquatic drone transect 9 was conducted throughout the inner existing marina. Aquatic drone transect 1 was conducted within the Proposed Development Site. High levels of siltation were noted throughout aquatic drone transect 9, with homogenous macrophyte species presence and coverage throughout the transect. Macrophyte species present consisted almost entirely of non-native starry stonewort and the Third Schedule Invasive species Canadian waterweed and Nuttall's waterweed (all recorded as ***Dominant)***.

Ivy-leaved duckweed (recorded as ***Abundant)*** was found in conjunction with the aforementioned species. Greater water-moss was recorded as ***Occasional.*** Quagga mussel was also found frequently attached to starry stonewort following grab samples.

Plate 3-54. A representative photo of Elodea sp. entangled throughout aquatic drone transect 9 within the existing marina

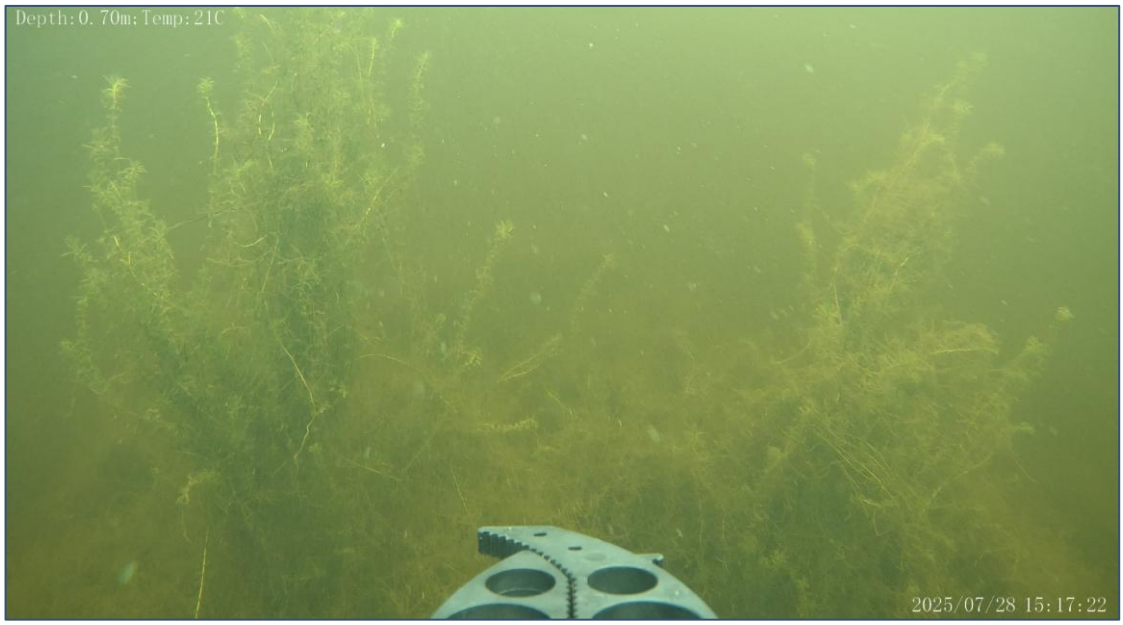

Plate 3-55. A representative photo of Elodea sp. observed throughout aquatic drone transect 9

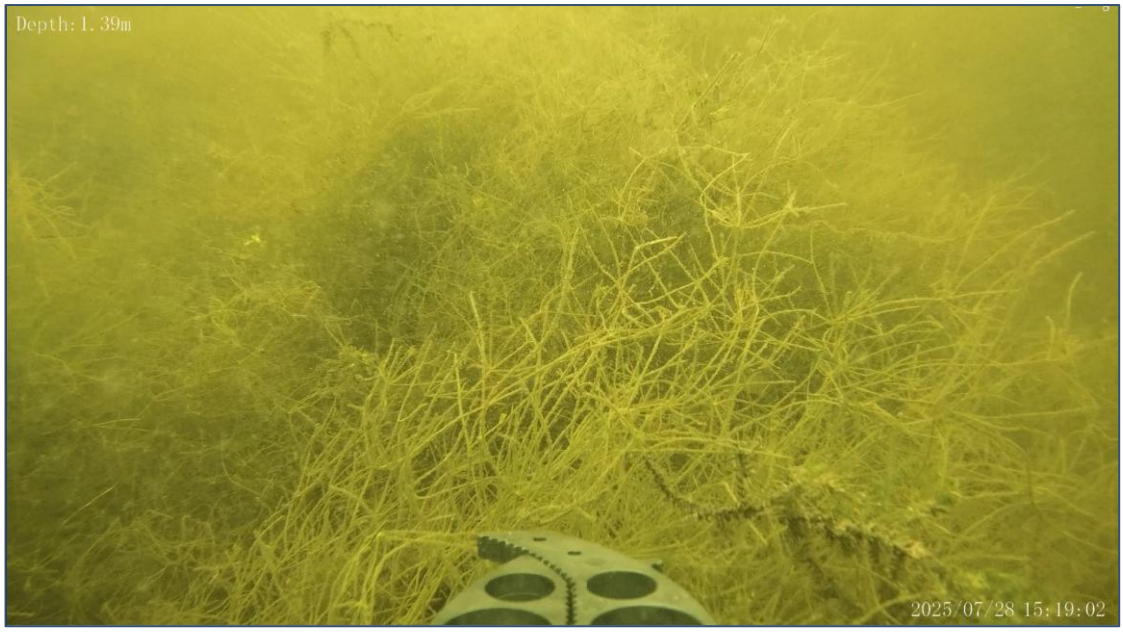

*Plate 3-56. A representative photo of the non-native starry stonewort (Nitellopsis obtusa) **Dominant** sections of aquatic drone section 9*

4. CONCLUSION

Species assemblage throughout Lough Ree in the vicinity of the Proposed Development showed affinity to habitat *3150 Natural eutrophic lakes with Magnopotamion or Hydrocharition - type vegetation,* listed in Annex I of the EU Habitats Directive and included as a Qualifying Interest of Lough Ree SAC [Site code: 000440].

Areas of the lakebed within up to the first 20 m were disturbed, with largely absent macrophytes. Disturbance via both water sports activities, wild swimming and boating is frequent along all areas of the shoreline within the Proposed Development Site. Areas of lake conforming to this habitat are already subject to a high level of existing disturbance within the Proposed Development Site.

Invasive, non-native species frequently observed during aquatic drone and wading transect surveys included starry stonewort, Third Schedule invasive species Canadian waterweed, First and Third Schedule invasive species Nuttall's waterweed, as well as the First and Third Schedule invasive faunal quagga mussel and zebra mussel, which densely colonised both the existing marina and the lakebed. Macroalgal coverage was also high throughout aquatic drone and wading transects.

5. REFERENCES

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