

Dry Creek salt fields vegetation impact mapping Spring 2021 update

Department for Environment and Water
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Summary report of DEW Technical report 2022/12



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Summary

In second half of 2020 dieback of mangrove and saltmarsh habitats south of St Kilda was observed. In 2021, the Department for Environment and Water (DEW) developed a mapping approach based on best available datasets to measure the extent and composition of dieback across the Dry Creek salt fields.

This report provides an update to the previous summary report released in August 2021. It summarises change in dieback area based on new multispectral satellite imagery over the entire salt field area in September 2021 and very high-resolution multispectral Remotely Piloted Aircraft System (RPAS or drone) aerial imagery over Section 2 in October 2021. These imagery products were used to manually map the dead native vegetation and quantify the impact on mangrove and saltmarsh habitats.

The project has determined that high spatial resolution imagery (plane or drone) is not necessary to monitor this kind of large-scale dieback. We recommend that future site scale monitoring can be done cost effectively through purchase of 50cm multispectral satellite imagery. This also assists with consistency of image specifications.

In addition, 10m resolution Sentinel imagery is a useful regular free independent source of vegetation and water indices. Drone and other ultra-high spectral and spatial resolution datasets are too fine grained and in need of specific (costly) ground truth data for large area monitoring, however useful for research into understanding of small area vegetation dynamics. Detailed vegetation survey data would assist such research by providing ground observation data.

Summary key points:

- Mapping analysis from October 2021 indicates the impact has been contained. It shows no expansion of dieback areas, except for a small number of mangrove trees at the edges.
 - The area of dead vegetation represents less than 1% of the local Barker Inlet mangrove and intertidal saltmarsh communities.
 - DEW has implemented a twice yearly mapping program to monitor the extent of dead vegetation in Summer and Spring each year.
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Key points and findings: Spring update

1. **Vegetation dieback at Dry Creek salt fields was previously mapped in March 2021. The total impact area estimated was 24 hectares. It consisted of approximately 9 hectares of mangrove; 10 hectares of saltmarsh; and nearly 5 hectares of bare, sparsely vegetated, or aquatic ecosystems.**
2. **New multispectral aerial imagery was captured at two dates in Spring 2021 (September and October) along with new ground observations of vegetation condition.**
3. **The Spring 2021 mapping outputs give total dead vegetation area estimate of 19 hectares, a net reduction due to combination of image differences and minor areas of changed vegetation condition (both positive and negative).**
4. **Despite minor edge variations of mapping outputs, there is no significant expansion of previous dieback areas, and no appearance of new dieback areas. (See vegetation dieback mapping from March and September 2021 overlaid in Figure 2.)**
5. **Image differences arise from variations in platforms and resolutions. COVID-19 restrictions at time of capture meant acquiring exactly the same specification was not possible. (March 2021 mapping was by plane at 15cm pixel resolution, September 2021 was by satellite at 50cm pixel resolution, October 2021 mapping was by drone at 8cm pixel resolution).**
6. **In the mangrove areas, variation is negative and estimated at less than 1 hectare. This represents some minor areas of reduced vegetation condition (e.g., at the leading edge of the impacted area, less than 0.1 hectares), as well as method and classification differences (e.g., reinterpreted extent of dead mangroves along creek lines).**

7. In the saltmarsh areas, variation is positive and estimated at 3 hectares. This represents some areas of improved vegetation condition (attributable to seasonal growth in the Spring), as well as method and classification differences (e.g., variations in water level, and areas of high tide driftwood).
8. In the bare, sparsely vegetated, or aquatic ecosystems areas, variation is less than 1 hectare. This represents method and classification differences (e.g., variations in water level, and areas of driftwood).
9. To help resolve method and classification differences, and assist research into small area vegetation dynamics, it is recommended that further data be sought (e.g., historic, anecdotal and expert).



Figure 1: Site map of Dry Creek salt fields on Gulf St Vincent indicating location of dead vegetation.

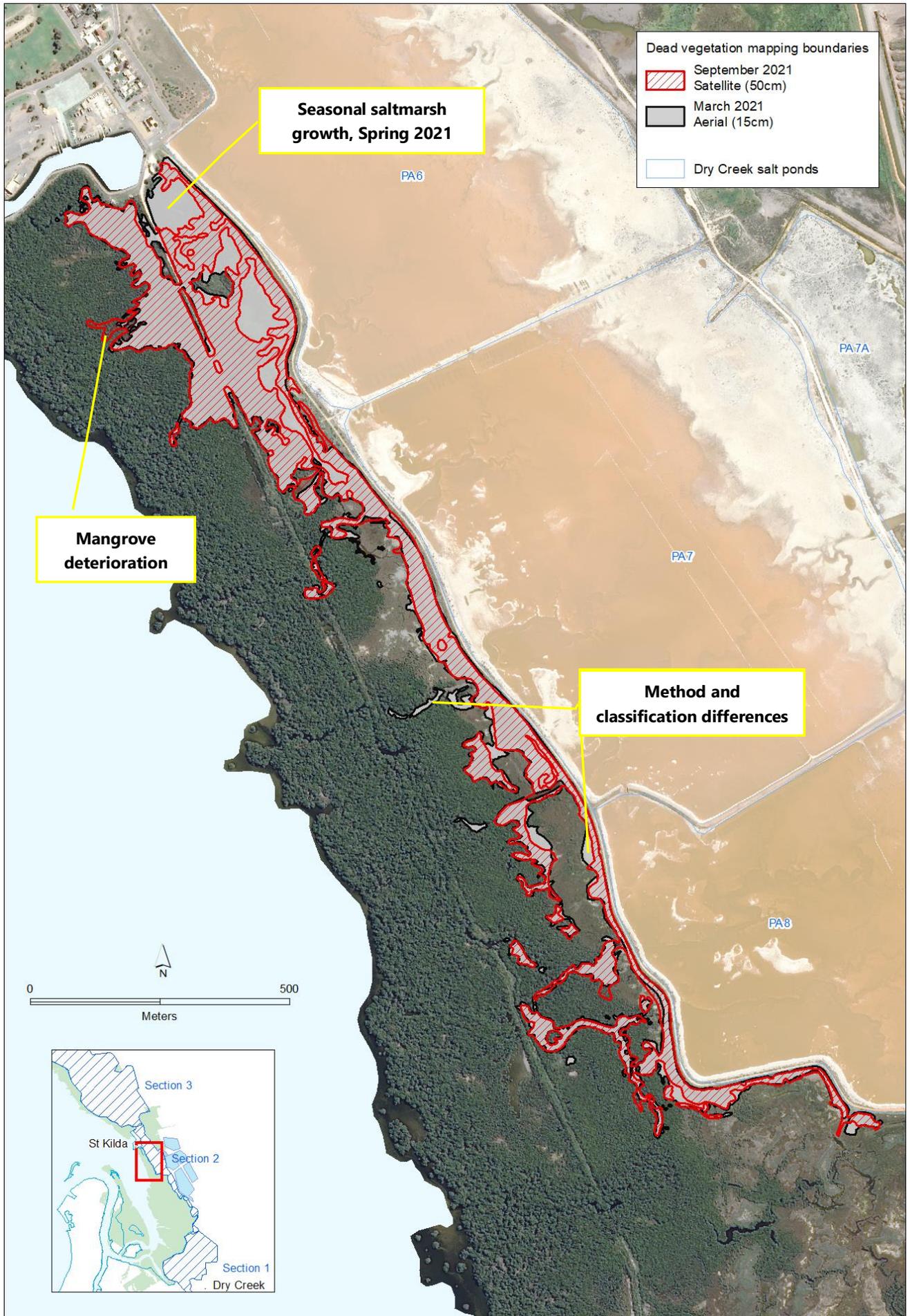


Figure 2: September 2021 mapping of dead vegetation from 50cm resolution satellite image compared to March 2021 mapping.



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