

The ecological effects of private jetties on estuarine communities in Lake Macquarie

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Source: LakeMac Today

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Artificial structures

- ▶ Estuaries have a mosaic of habitats; dependent on effective management strategies
- ▶ Artificial structures are increasingly common in estuarine environments
 - ▶ Can enhance diversity of habitats
 - ▶ Typically increase biomass of fish

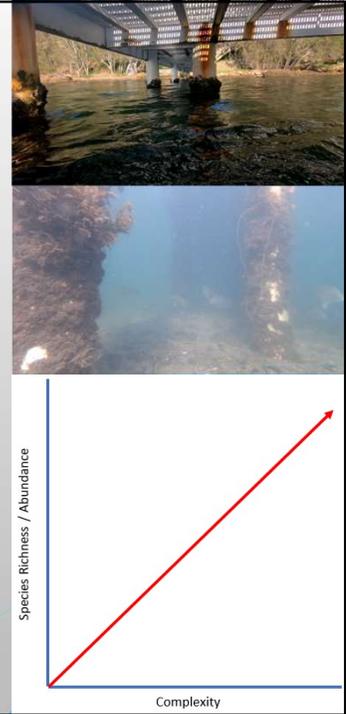


Source: Newcastle Herald, 2012

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Jetties as artificial structures

- ▶ Used as access to deeper water for boating
- ▶ Impacts light availability (Gladstone & Courtenay, 2014)
- ▶ Provides habitat for mobile and sessile marine biota
- ▶ Habitat structural complexity:
 - ▶ Creates a greater number of areas for refuge from predators
 - ▶ The higher the structural complexity, the higher the species diversity



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Knowledge gap

- ▶ Clarify and simplify current LMCC regulations
 - ▶ Assist in development application for foreshore structures
 - ▶ Understand ecological effects of current and future structures
 - ▶ Fish assemblage
 - ▶ Habitat
- } This study

7.2 JETTIES

Objectives

- a. To facilitate waterway recreation through jetty access to boats, where reasonable depth of water can be obtained without dredging.
- b. To maintain the visual character and natural landscape of Lake Macquarie by reducing the number of jetties within the Lake through the use of shared jetties where adjoining private residences are present.
- c. To mitigate adverse impacts of jetties on ecological processes and marine life.
- d. To ensure that jetties do not adversely affect the amenity of the Lake or its foreshore.



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Study site and sampling design



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Methods RUVS and ROVS

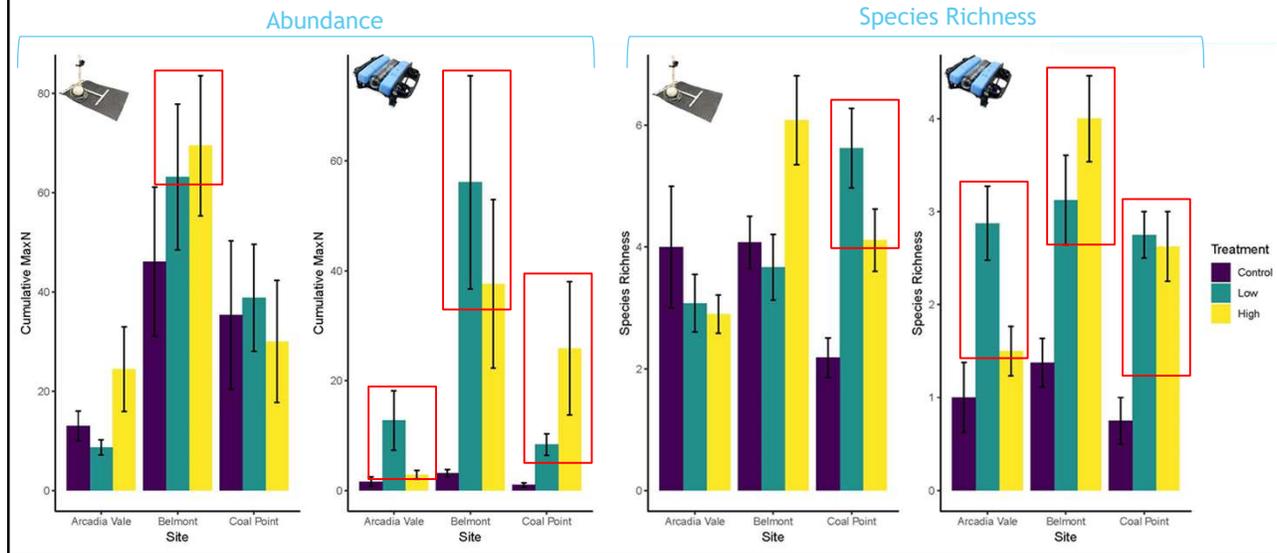
- ▶ Complimentary methods
- ▶ RUV: 30 minute soak time (Harasti et al., 2015)
- ▶ ROV: 150m transects
- ▶ 8 replicates per treatment and per season



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Analysis of fish assemblages

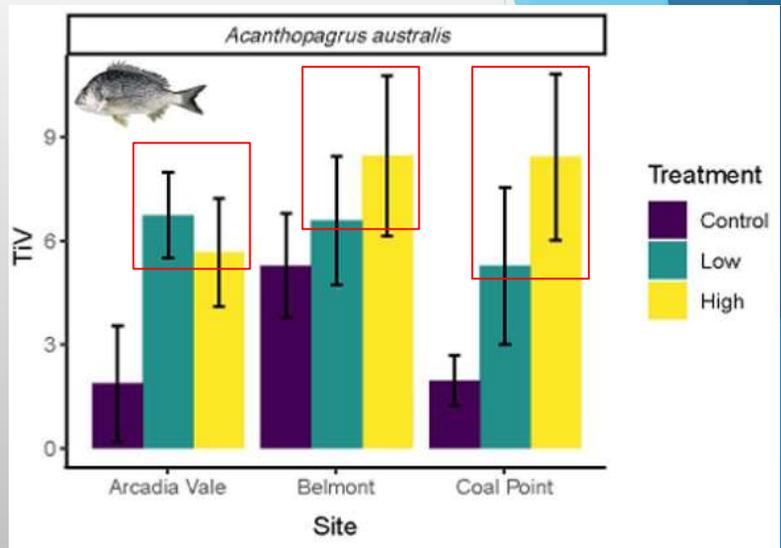
▶ 27 species total observed



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Time in View

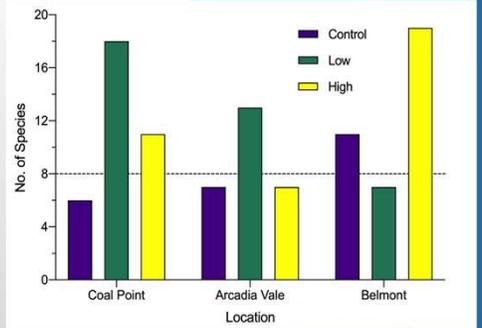
- ▶ Indicator of habitat use and residency
- ▶ The presence of a jetty increases residence time



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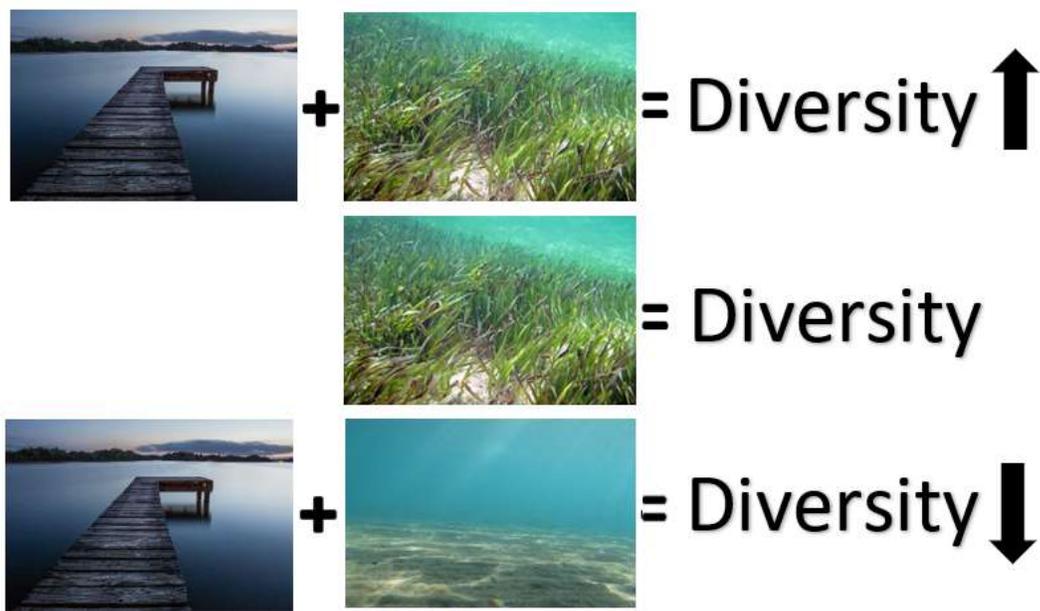
Effects of jetties on fish assemblage

- ▶ Highest cumulative abundance at each site found in treatments containing jetties
- ▶ Total species richness positively driven by addition of jetties
- ▶ Presence of jetties included new species
- ▶ Addition of jetties influenced use of habitat



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Take home message



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Conclusions



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- ▶ Presence of jetties increased abundance and diversity of fishes
- ▶ The presence of jetties can benefit estuarine communities **BUT** high densities of jetties may decrease seagrass cover and should be monitored



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