Stormwater Pollution Management: Measuring Performance

Andrew Grant, Melbourne Water

June 2018

Why this talk?

Decision making

Communication

Investment

"I have been struck by how important measurement is to improving the human condition.

You can achieve incredible progress if you set a clear goal and find a measure that will drive progress toward that goal . . . .

This may seem basic, but it is amazing how often it is not done and how hard it is to get right"

Better waterways
and drainage
for our community

An investment plan

July 2016 – June 2021

Melbourne Water

Draft Healthy Waterways Strategy

Key Messages

Developing meaningful performance measures for stormwater management is challenging

Hydrological based targets are the most relevant to waterway health

We need to transition our performance reporting for stormwater from pollutant-based targets to hydrological based targets

Pollutant Load Approach
Waterways & Drainage Investment Plan

Waterways & Drainage Investment Plan

What is the WDIP?

Waterways & Drainage Charge

21 KPIs:

- Flooding
- Stormwater
- Diversions
- Incident response
- Development services
- Waterways management
- Liveability
- Community satisfaction

Better waterways and drainage for our community

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Waterways & Drainage Investment Plan

Stormwater related KPIs

- Pollutant Loads

- Facilitated Stormwater Management (Living Rivers Program)

- Capacity Building (Clearwater)

- Diversions

Better waterways and drainage for our community

An investment plan

July 2016 – June 2021

Waterways & Drainage Investment Plan

Pollutant Load Target

"Interventions completed over 2016/17-2020/21 maintain or reduce runoff and pollutants from urban and rural catchments against an established baseline"

Plain Language

"Reduce pollutants reaching waterways and the bay"

June 30th 2016

155 tN/y is being removed through MW activities in the Port Phillip Bay catchment

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TN loads to Port Phillip Bay from surface waters
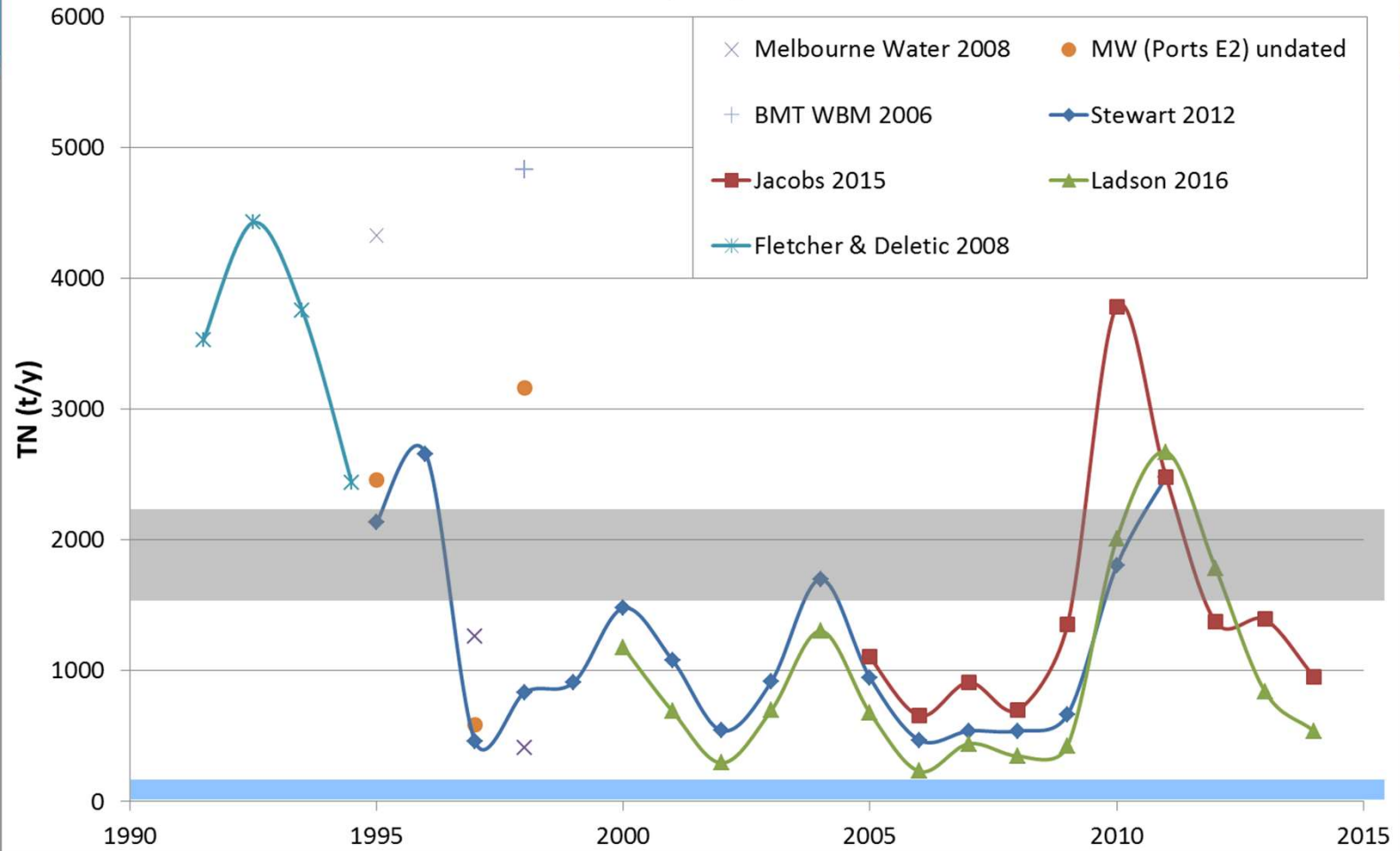
Why do we use N as an indicator?

Port Phillip Bay EMP (2017)

3. *"Ensure nutrient and sediment loads do not exceed current levels . . ."*

3.1 *"Effectively maintain existing stormwater infrastructure and programs to mitigate loads to the Bay . . ."*

3.3 *"Ensure all urban and rural land use effectively controls impacts from stormwater and runoff, and that controls are in place to manage increases in loads"*

Port Phillip Bay
Environmental Management
Plan 2017–2027
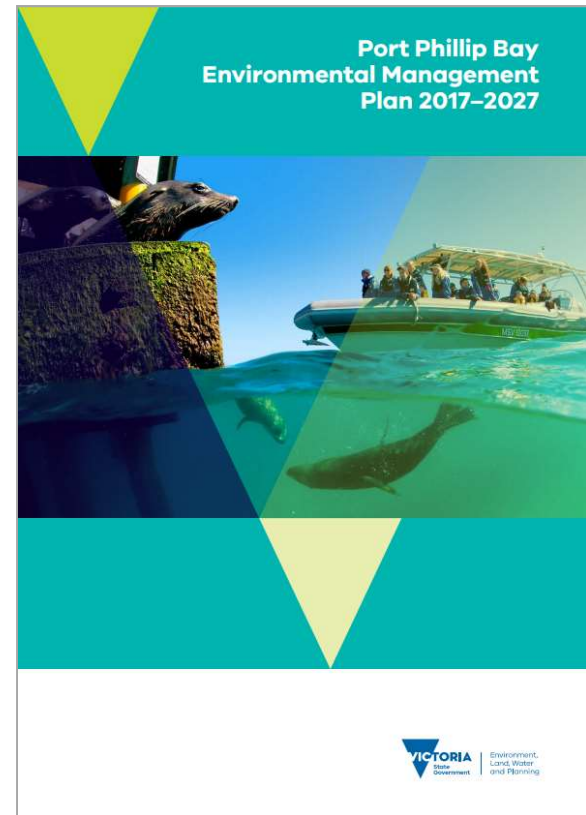
Why do we use N as an indicator?

Strengths

- An indicator of overall stormwater quality
- Commonly used, e.g.
  - Best Practice Environmental Management Guidelines
  - MUSIC modelling
  - Port Phillip Bay Environmental Management Plan
- Melbourne Water's reporting systems set up to measure

Pollutant Load Approach

Weaknesses of N as an indicator

- Highly uncertain measurement
- Difficult and expensive to monitor
- Weak correlation with waterway health
- Output measure (rather than outcome)

Conundrums

What is the scope?

- Streams process nitrogen
- Flooding events are the trigger of N blooms in Port Phillip Bay
- Diversions from waterways
- Floodplain engagement
- Revegetation programs

S.M.A.R.T.

Specific ✓

Measurable ~

Assignable ✓

Relevant ~

Time-related ✓

"In certain situations it is not realistic to attempt quantification . . . . can lose the benefit of a more abstract objective in order to gain quantification"

George T. Doran

(who invented SMART criteria)

Summary

Pollutant load approach

- Consistent with past approaches
- Reasonably easily understood
- Can track performance
- Drives performance towards improving stormwater quality

Weaknesses

- Highly uncertain estimate of total load
- Weak correlation with ecological outcomes
- Scope creep

Volume Based Targets
Healthy Waterways Strategy

Healthy Waterways Strategy

What is HWS?

Visions and goals for each of the five catchments

Performance objectives across:

- Stormwater

- Vegetation

- Water Quality

- Litter

- Water for Environment

- Instream Connectivity

- Access & Participation

Draft Healthy Waterways Strategy

Why hydrology as an indicator?

Why hydrology as an indicator?

Strengths of hydrology as an indicator

- Strong correlation to waterway health
- An indicator of overall stormwater quality
- Easy* to model

Draft Healthy Waterways Strategy

* Subject to guidelines being written

Maribyrnong Catchment

Map at A4   Scale 1: 315,000
24/05/2018

Legend:
- Sub-catchment Boundary
- Existing Urban
- Future Urban
- Parks & Reserves
- Township
- Wetland / Waterbody
- Rivers, Creeks and Drains
- Stormwater Priority areas
- Veg. buffers to establish
- High quality veg. to maintain
- Fish Barrier to remove (over next 10 years)
- Fish Barrier to remove (over next 50 years)
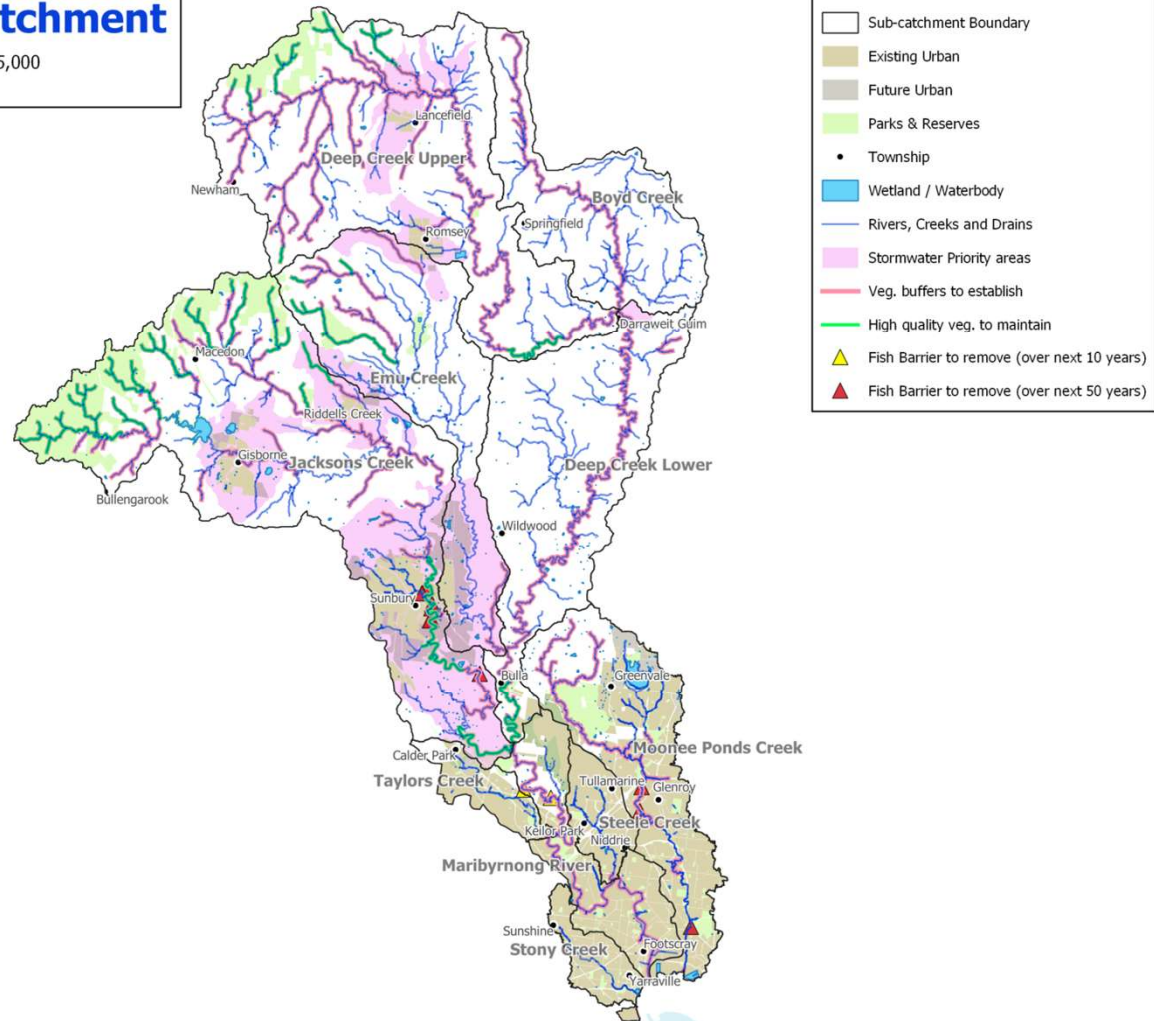
Source: Melbourne Water.

Werribee Catchment

Map at A4   Scale 1: 375,000
24/05/2018

Legend:
- Sub-catchment Boundary
- Existing Urban
- Future Urban
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- Township
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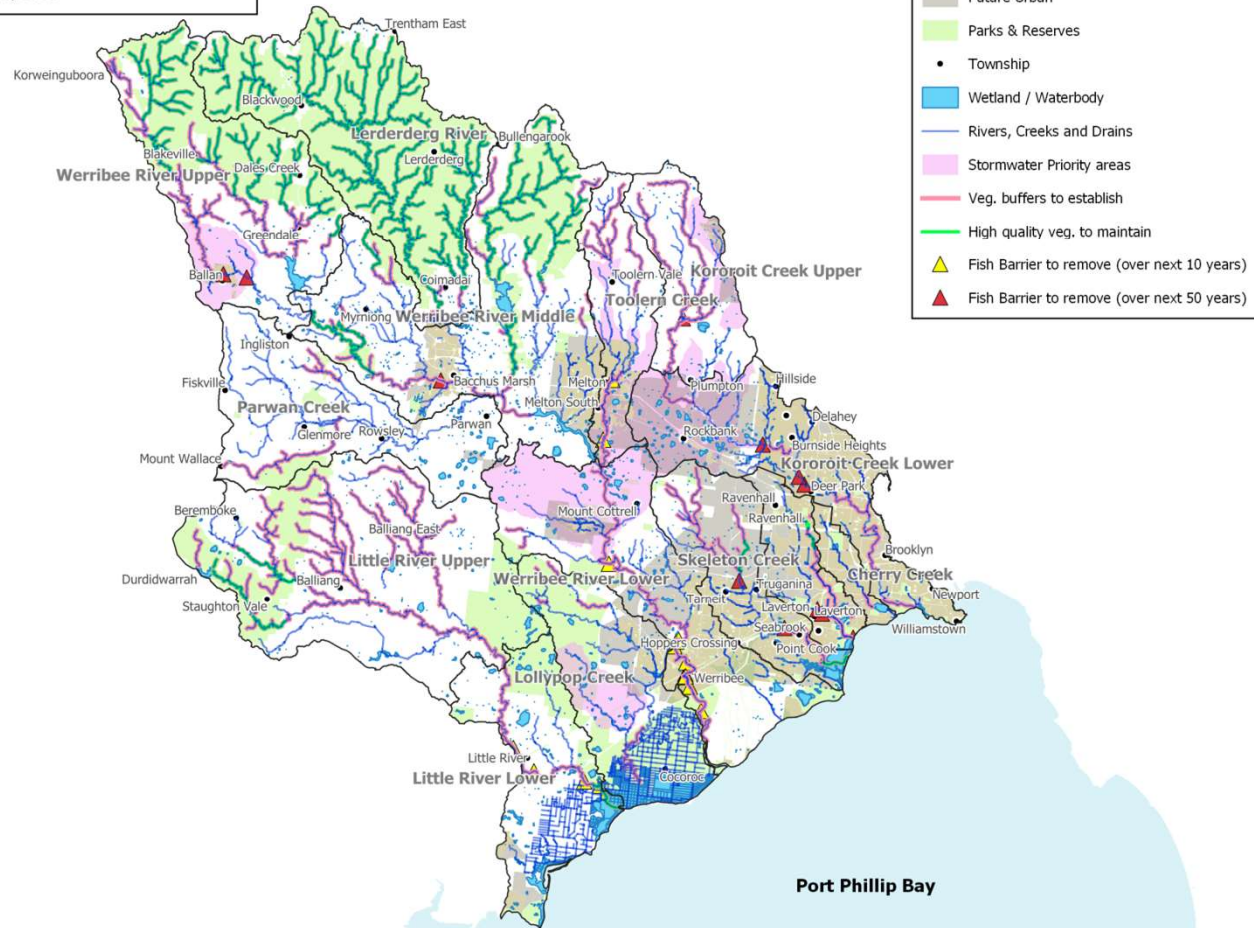
Source: Melbourne Water.

Westernport Catchment

Map at A4   Scale 1: 470,000
24/05/2018

Legend:
- Sub-catchment Boundary
- Existing Urban
- Future Urban
- Parks & Reserves
- Township
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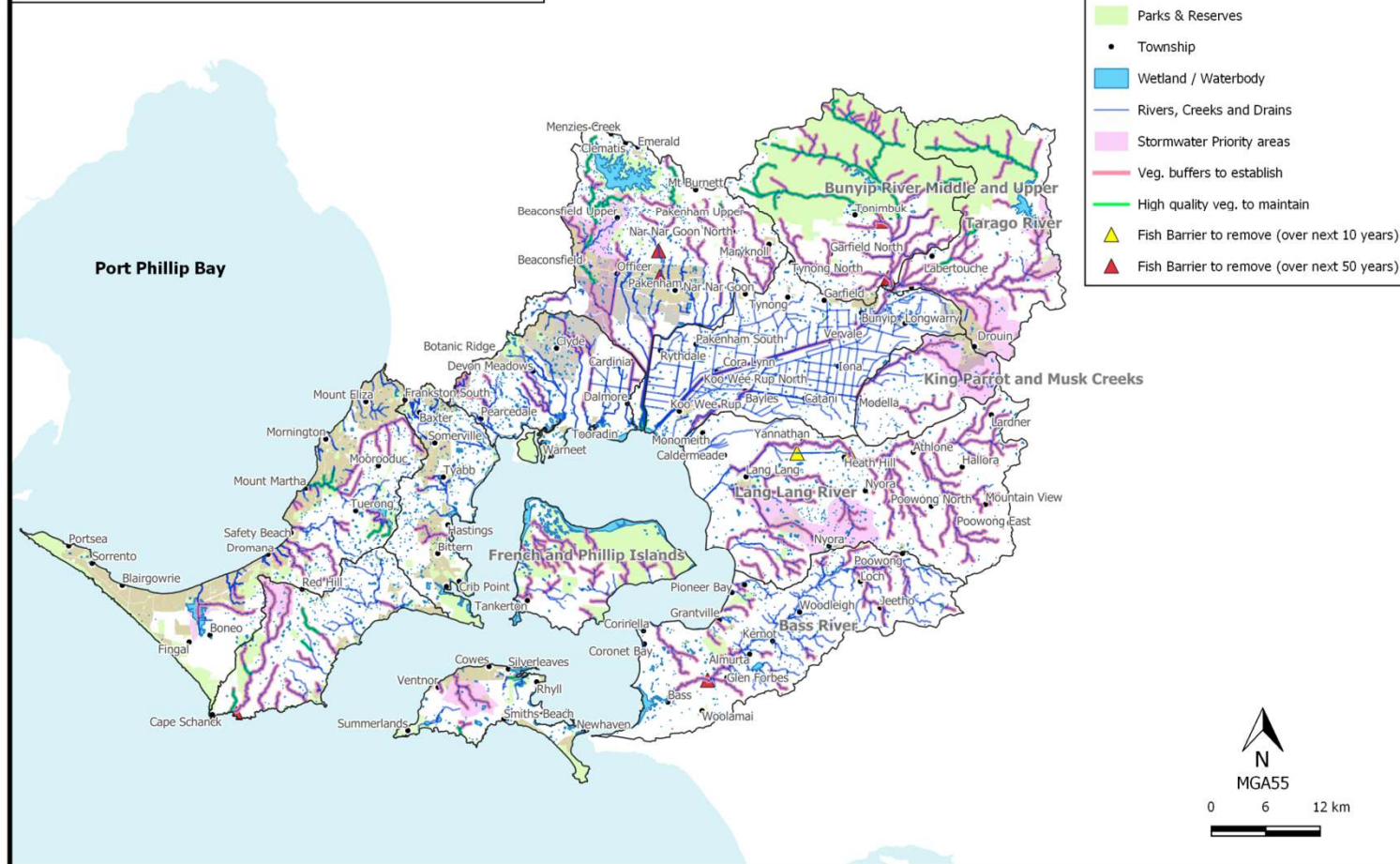
Source: Melbourne Water.

Dandenong Catchment

Map at A4   Scale 1: 200,000
24/05/2018

Source: Melbourne Water.

Legend:
- Sub-catchment Boundary
- Existing Urban
- Future Urban
- Parks & Reserves
- Township
- Wetland / Waterbody
- Rivers, Creeks and Drains
- Stormwater Priority areas
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- Fish Barrier to remove (over next 10 years)
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24
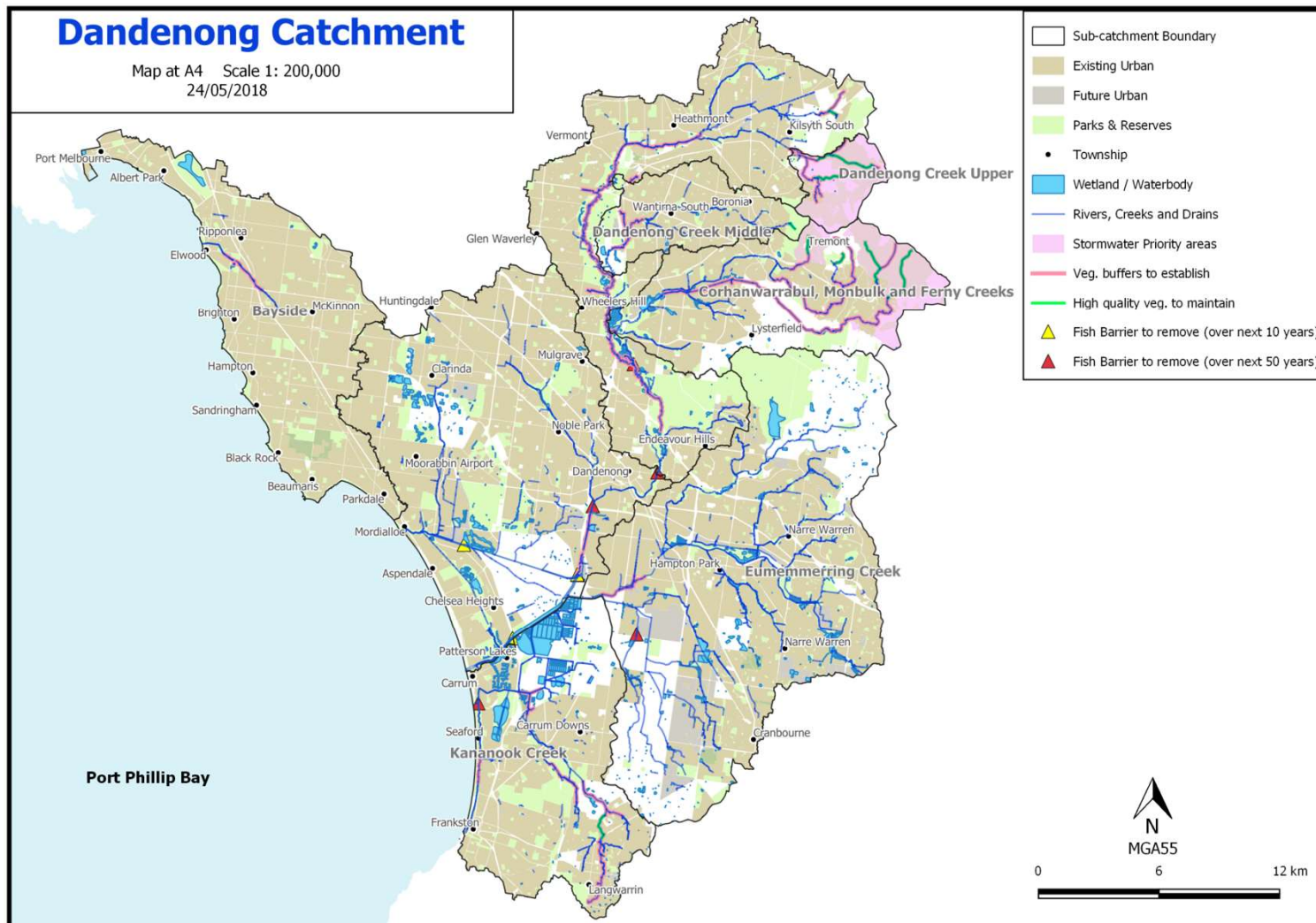
Yarra Catchment

Map at A4   Scale 1: 400,000
24/05/2018
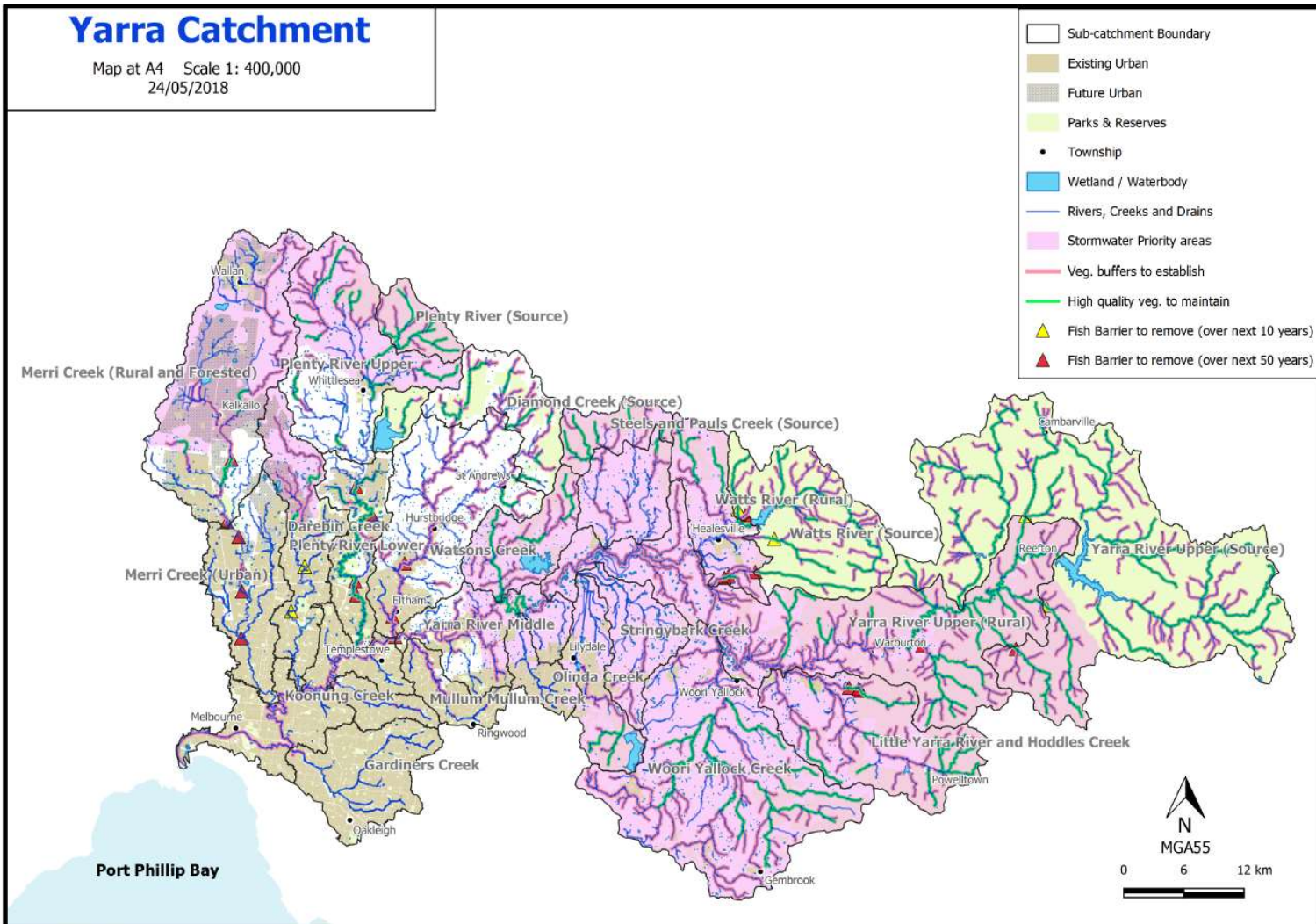
Source: Melbourne Water.

Example of a Performance Objective

"Prevent decline in stormwater condition by treating urban development in Emu Creek catchment (e.g. from new developments in Sunbury), so directly connected imperviousness (DCI) remains below 0.4% at the confluence with Deep Creek.

For every hectare of new impervious area, this requires harvesting around 4.4 ML/y and infiltrating 1.1 ML/y, which is about 3.4 GL/y and 0.8 GL/y for full development to the urban growth boundary."

Performance Objectives

38 objectives across the region

Over the next 50 years

- 80 GL/y of harvesting
- 20 GL/y of infiltration

Draft Healthy Waterways Strategy

S.M.A.R.T.

Specific   ✔

Measurable   ✔

Assignable   ✔

Relevant   ✔

Time-related   ✔

Key Messages

Developing meaningful performance measures for stormwater management is challenging

Hydrological based targets are the most relevant to waterway health

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Thank you

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Waterways Strategy stormwater targets

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