# NSW Trout fishery monitoring

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# What are we doing and why?

| Question | Monitoring/ Research | Possible management response |
|---|---|---|
| Snowy lakes spawning run- what is the season, fish size, locations, numbers (status and trends)? | Fish counters, Gaden trap, stream bed capacity calculations/ modelling | Adjust closed season, Improve spawning habitat and resources, Adaptive stocking (focus on lean years) |
| What are the status and trends of trout populations in the snowy lakes? What causes changes? How effective is stocking? | Hydroacoustics, citizen science, tagging, food web studies | Adaptive stocking, habitat or food web improvements programs |
| Monitor the status and trends of trout populations (numbers, sizes, distribution)? Is there natural recruitment and/ or is stocking effective? | Stream electrofishing monitoring, tagging | Adaptive stocking (focus on locations with the highest benefit/ need) |
| What is the mortality of fish (angler harvest, catch and release)? | Creel survey, statewide telephone survey, catch & release and natural mortality estimates | Adjust (relax or constrict) bag, size or spatial restrictions |

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# Survey Methods

Standard sampling protocol at 15 sites in each region:

- 8 x 150 sec shots using a backpack electrofishing techniques covering ~500m of stream at each site
- All fish captured were identified, counted and measured.
- Undertaken ~8 weeks post stocking, so fish had time to settle and disperse.
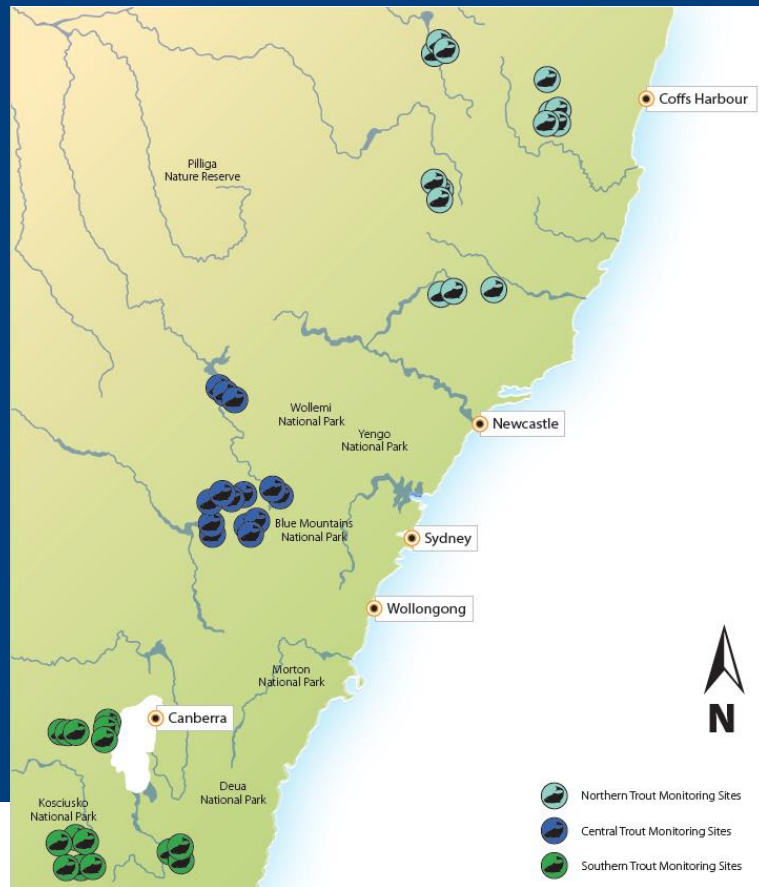
# Report cards

- Long term monitoring program across 3 NSW trout regions
- Short term feedback
  - Timing important
  - Authentic
  - Basic cards and more detailed report



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# Report card categories





| Abundance | A = >10 fish/ 100m at 3 or more rivers<br>B= At least 5 fish/ 100m at 3 or more rivers<br>C= At least 2 fish / 100m at 3 or more rivers<br>D= At least 0.5 fish/ 100m at 3 or more rivers<br>F= 0 – 0.5 fish/ 100m at 3 or more rivers |
|---|---|
| **Recent recruitment/ stocking success** | A= Fish <12cm at 12 or more sites<br>B= Fish <12cm at 8 to 11 sites<br>C= Fish <12cm at 3 to 7 sites<br>D= Fish <12cm at 1 to 2 sites<br>F= no fish <12cm |
| **Mature fish** | A= Fish >25cm at 12 or more sites<br>B= Fish >25cm at 8 to 11 sites<br>C= Fish >25cm at 3 to 7 sites<br>D= Fish >25cm at 1 to 2 sites<br>F= no fish >25cm |
| **Multiple size classes** | A= various sized fish from 5 to >45cm<br>B= various sized fish but few very large or few smaller fish<br>C= various sized fish but no very large or very small fish<br>D= very limited size range<br>F= only one size range |
| **Distribution** | A= All sites contain trout<br>B= 10-14 sites contain trout<br>C= 6-9 sites contain trout<br>D= 3-5 sites contain trout<br>F= <3 sites contain trout |
| **Overall rating** | Excellent = A or B on all categories across both species<br>Good = A, B or C on all categories for both species<br>Moderate = Mostly A, B, C on all categories for both species<br>Poor = Multiple D and F for both species<br>Very poor= D and F on all categories across both species |

# Results

| | Northern | | | | Central | | | | Southern | | | | Victoria* | |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| | Brown | | Rainbow | | Brown | | Rainbow | | Brown | | Rainbow | | Brown | Rainbow |
| | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | 2019 | 2020 | | |
| **Fish per 100m** | 1.2 | **1.3** | 9.3 | 1.9 | 0.6 | **0.8** | 3.4 | 2.5 | 1.8 | **1.8** | 2.5 | 0.7 | 3.4 - 23.5 | 1.2 - 13 |
| **Catchable fish per 100m** | 0.7 | 0.0 | 0.1 | 0.0 | 0.2 | 0.0 | 0.1 | 0.0 | 0.5 | 0.2 | 0.1 | 0.05 | 0.2 - 5 | 0.5 - 2.2 |
| **Largest (cm)#** | 43 | 26 | 43 | 24 | 45 | 26 | 35 | 11 | 30 | **34** | 21 | **23** | 25 - 54 | 10 - 33 |
| **Average size of catchable trout** | 26 | NA | 26 | NA | 31 | 26 | 28 | NA | 26 | 23 | 21 | 21 | 23 - 33 | 22 - 25 |

*Data ranges for 6 Victorian rivers sampled in 2018 (see Talk Wild Trout 2018 conference proceedings)
#NSW fish fork length and Vic total length

# Trout Monitoring

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## Southern Region

### REGION HIGHLIGHTS

| | |
|---|---|
| FISH PER 100M | Snowy River |
| CATCHABLE FISH PER 100M | Snowy River |
| LARGEST CAUGHT | Goobarragandra River |
| AVERAGE SIZE OF CATCHABLE TROUT | Snowy River |
| BEST FOR RAINBOW TROUT | Goodradigbbe or Snowy River |
| BEST FOR BROWN TROUT | Mowamba or Snow River |

### Report Card

| | RAINBOW | BROWN |
|---|---|---|
| ABUNDANCE | D | D |
| RECENT RECRUITMENT | B | B |
| MATURE FISH | F | C |
| MULTIPLE CLASS SIZES | D | C |
| DISTRIBUTION | C | B |
| OVERALL RATING | Poor/Moderate | |

### LOOKING AHEAD

» This report focuses on resident stream fish in the southern region and does not reflect span run fisheries or those supplemented by lakes. Keep an eye out for spawn run monitoring data to better understand how those populations are tracking.

» Locations such as Goobarragandra River might benefit from improved stocking protocols. For example, stocking smaller numbers of fish at a range of locations throughout the catchment and in particular in the upper reaches might improve recruitment and monitoring results across all sites. Look for improvements here due to these updated stocking protocols.

» Tailrace fisheries (e.g., Tumut River) may provide further angling opportunities in this region. These are not included in this sampling due to the size and higher flows which make surveys more complex.
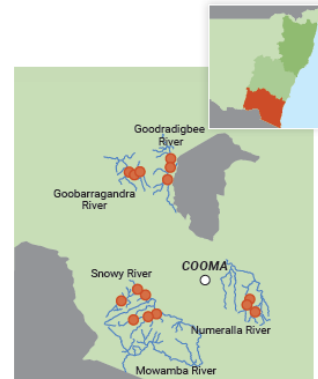
### OVERVIEW OF RESULTS

| RAINBOW | BROWN | |
|---|---|---|
| 2.5 | 1.8 | FISH PER 100M |
| 0.1 | 0.5 | CATCHABLE FISH PER 100M |
| 21cm | 30cm | LARGEST CAUGHT |
| 21 | 26 | AVERAGE SIZE OF CATCHABLE TROUT |

### OTHER SPECIES RECORDED

» River blackfish, mountain galaxias, shortfin eel & European carp



Goodradigbee River
Goobarragandra River
Snowy River
COOMA
Numeralla River
Mowamba River

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# 2. Snowy Lakes Trout Monitoring

# Tagging (rainbow trout)

| Year | Jindabyne | | Eucumbene |
|---|---|---|---|
| | **January** | **April/ May** | **January** |
| Number | 75,000 | 10k + 10k heat treated | 150,000 |
| 2012-2017 | 100% | | 25% |
| 2018 | 52% | 100% | 33% |
| 2019 | 24% | 100% | 0% |
| 2020 | 58% | 100% | 0% |

- 14% (+1.7% broodstock) stocked fish in Thredbo spawn run (Gaden trap data) and 4% in Eucumbene in 2019 (electrofishing data)

- 4% 4 year olds, 88% 3 year old fish and 8% 2 year old fish in Thredbo and all 2 year old fish in Eucumbene

# Snowy Mountains Trout Fest

**Citizen science**
*(Angler catches)*

**Rainbow trout**

- Majority of catch wild fish

- Wild 2 year old fish dominating catches

## Jindabyne

### 2015, n = 50

Wild 58%
Stocked 42%

### 2016 n = 162

Stocked 34%
Wild 66%

### 2017 n = 61

Stocked 31%
Wild 69%

### 2018 n =165

Stocked 36%
Wild 64%
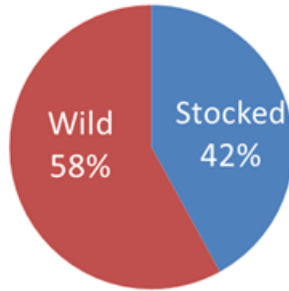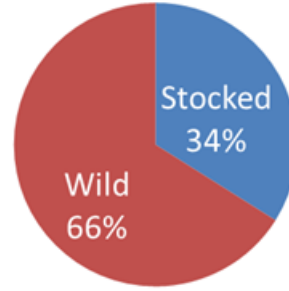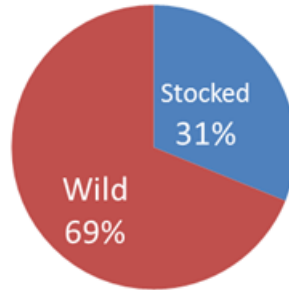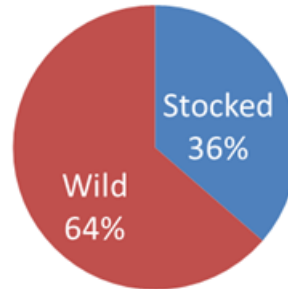
## Eucumbene

### 2018 n =72

Stocked 12%
Wild 88%
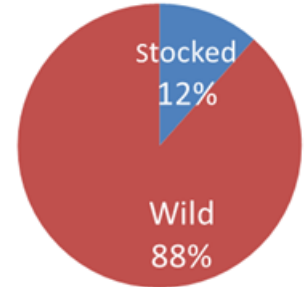
# Trout fest 2019

- 3yr old 75,000
- 2yr 75,000*
- 2yr 10,000 x 2
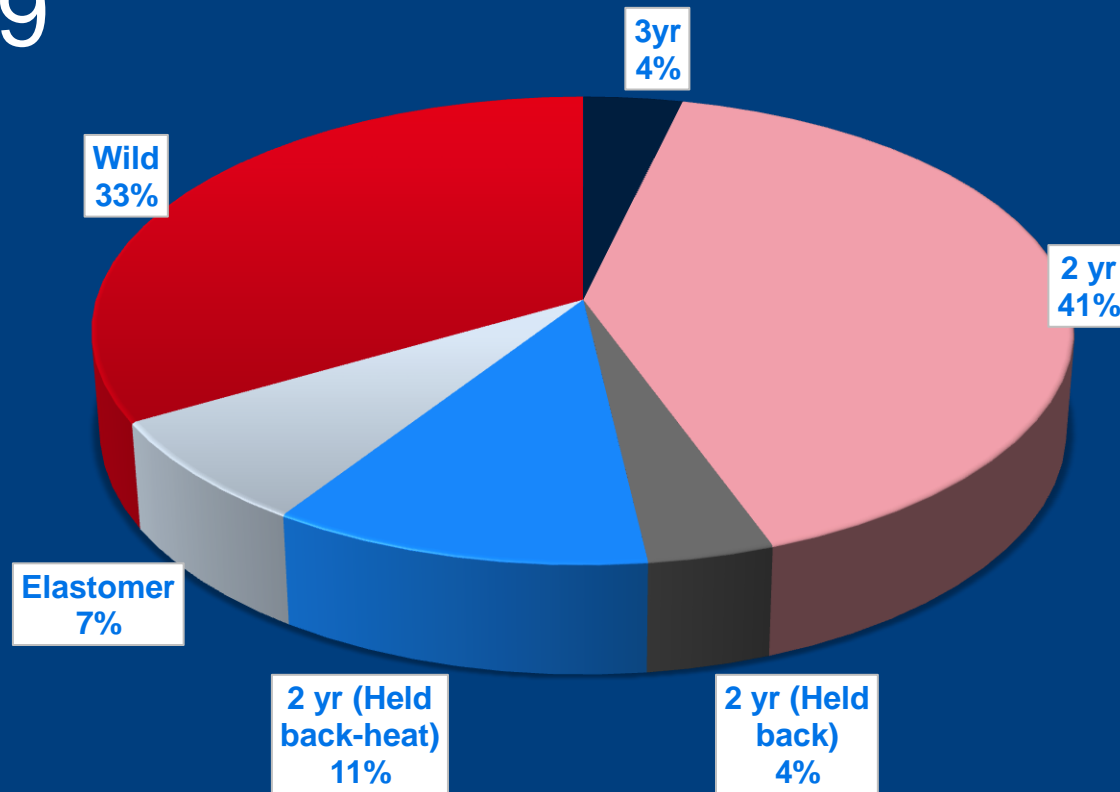
**Note:**
1. ***Held back*** fingerlings released in April/ May not January.
2. ***Heat*** fingerlings are those maintained at more optimum growth temperatures.



- 3yr 4%
- 2 yr 41%
- Wild 33%
- Elastomer 7%
- 2 yr (Held back-heat) 11%
- 2 yr (Held back) 4%

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# Spawn run- Gaden

- Trap data 2019
  - Rainbow trout = 174
    - Down on last two years
  - Brown trout = 1730
    - Up on last two years
  - Trap kept in longer
  - Sizes= stable for both species 2019 (2020?)

# Trout size



Hughes Creek- Rainbow trout
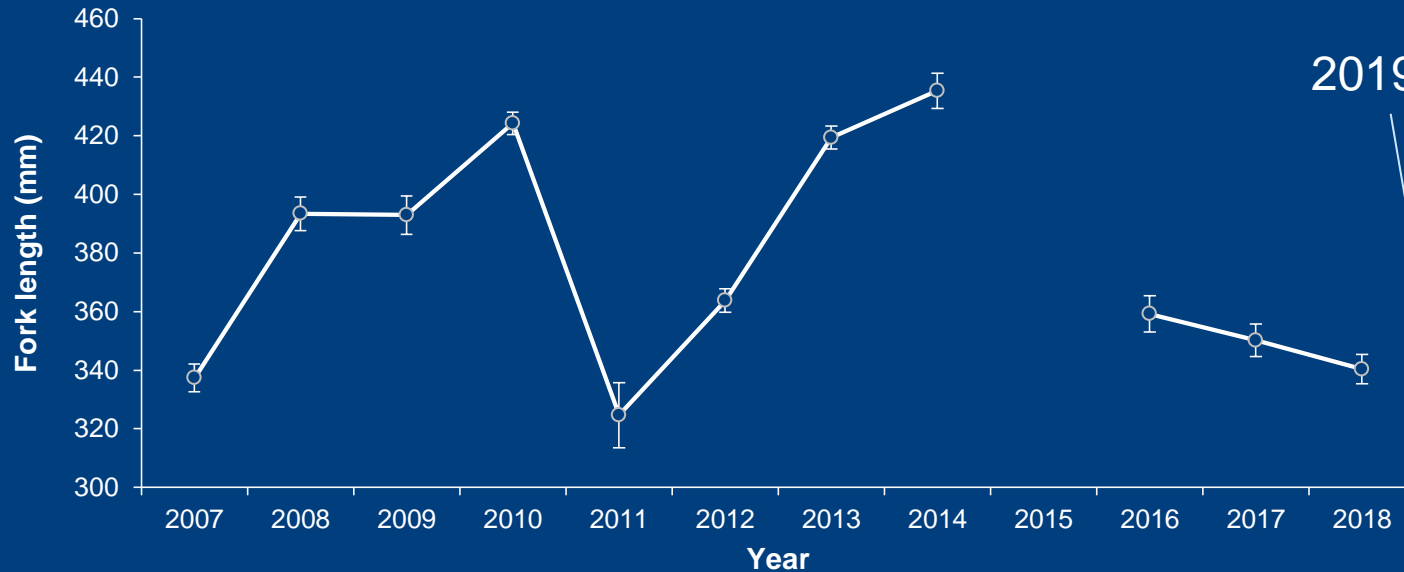
# Fish counters

- Provide information on spawning times and the size and number of fish

- VAKI river watcher
  - Swamp Creek

  - Infrared scanner (speed, length, body depth, direction)

  - Scanner triggers video for verification and species identification



2018-10-17 22:41:56

1:16 / 2:15

# Trout Scouts

- Camera systems  x 4
  - Tolbar Creek
  - Hughes Creek
  - Lucas Creek
  - Kalkite Creek (Jindabyne)
- Security camera with motion detection

# Swamp creek

- 1800+ records in 2019 (6800+ since 15/4/20)
- Overlap between rainbow and brown trout in 2019
- Mostly brown trout
- Rainbow and Browns still moving in November/ December



**RIVERWATCHE**
DAILY
RIVERS    REPORT    USER    CONTACT    HELP

**Eucumbene River, AU**

This Riverwatcher is part of the New South Wales Department of Primary Industries monitoring program of the Snowy Lakes trout fishery. This program is funded by the NSW Recreational Fishing Trusts. The Riverwatcher is situated in the upper Eucumbene catchment on Swamp Creek. This is a small alpine water body that receives a winter run of spawning brown and rainbow trout out of Lake Eucumbene. The data from this counter will provide valuable information on the numbers of fish

Measured migration in [Eucumbene River] from Jul 24, 2019 to Nov 14, 2019

● Migration    — Temperature

From: Jul 24, 2019    to: Nov 14, 2019    Redraw ☐ All    1hrs 50min  ?

Last    Largest

**Last fish seen**

Nov 14, 2019 20:08 LT
4 hours and 41 minutes ago
Estimated length: 24cm
Direction: Down River

|  | Up | Down | Up-Down |
|---|---|---|---|
| Today | 1 | 1 | 0 |
| Yesterday | 0 | 2 | -2 |
| Last 7 days | 19 | 16 | 3 |
| Last 30 days | 57 | 82 | -25 |
| This year | 721 | 945 | -224 |

# Swamp creek

- Fish sizes
- Public data

# Scan and video of large fish

(78cm long 16 cm deep) *NOTE: (85cm and 81cm went through this morning)*
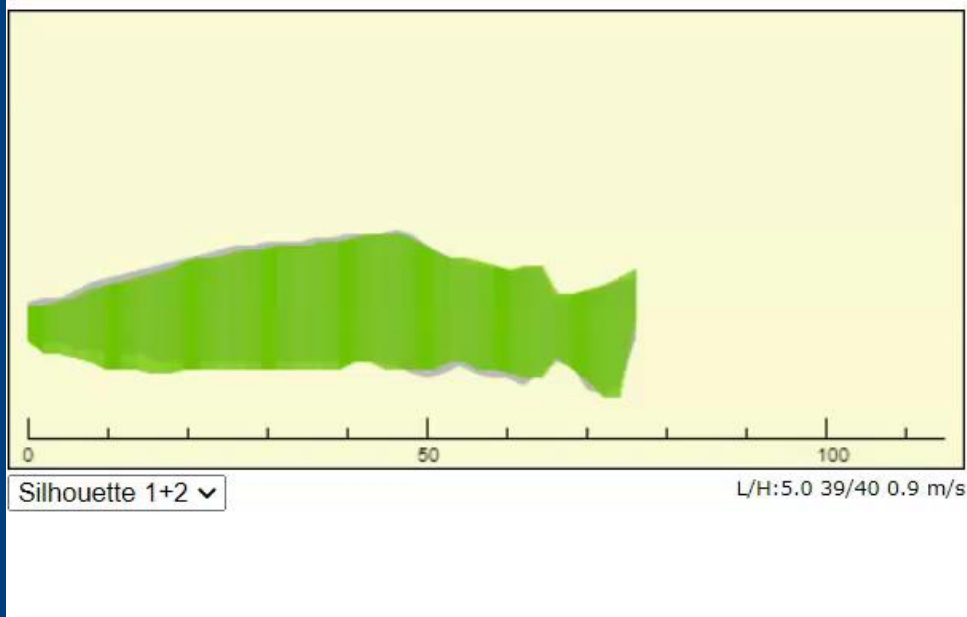
# TroutScout video systems

- Video systems that give information on number, approximate size and season
- Brown and Rainbow recorded in all catchments
- Spawning size fish recorded after October long weekend in all creeks
- Numbers of fish < than those recorded in Swamp Creek for the VAKI

Blue= Vaki or Trap
Red= Trout Scout
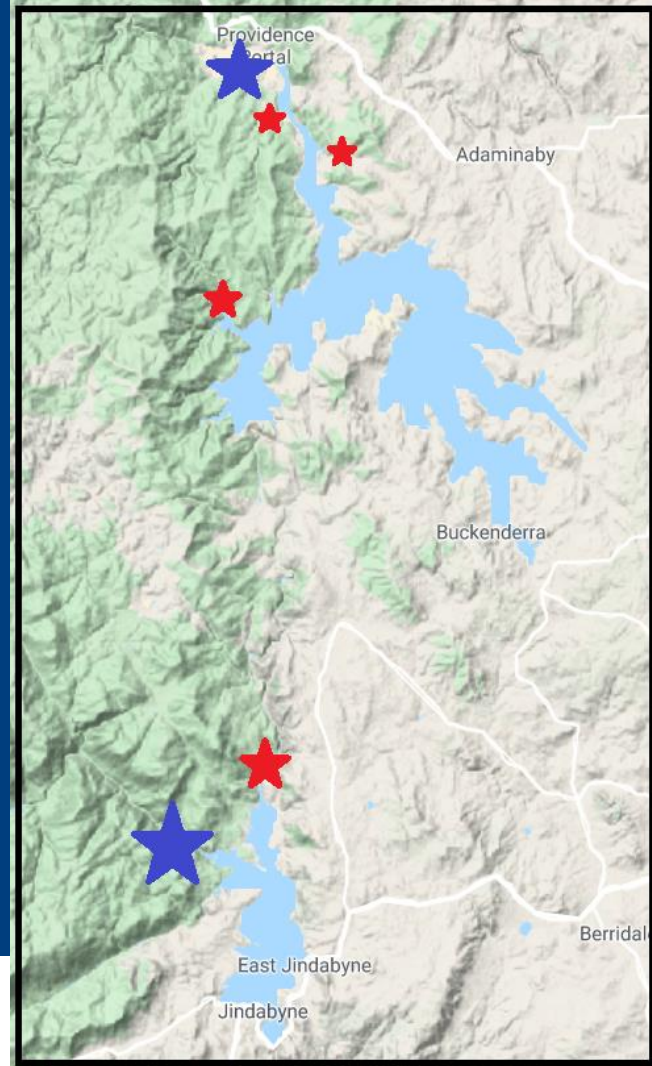
# Kalkite- large brown (55-60cm)

# Kalkite- large brown or salmon (> 70cm)

# Kalkite- Rainbow trout x 2 (~40cm)

# Kalkite- large eel (~100cm)

# Kalkite- Platypus

# Lucas Creek- small trout (~15cm)

# Lucas Creek- Brown trout (~35cm)

# Lucas Creek- rainbow trout (~40cm)

# Automated processing

- Custom program now developed to filter video footage and identify trout.

- Manual size estimates
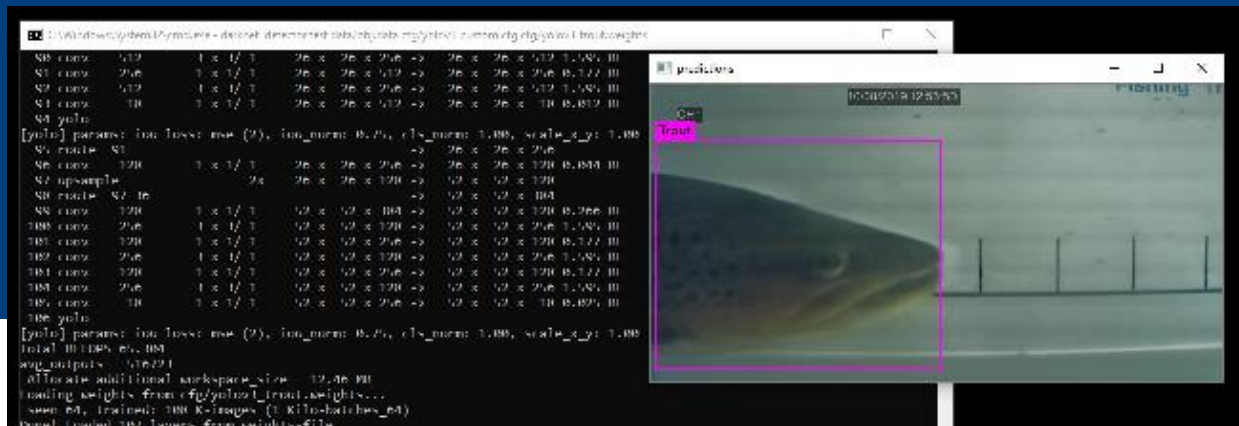
# Hydroacoustics surveys

- Generate biomass estimates/ population estimates in impoundments
- Jindabyne and Eucumbene Dams completed
- Tantangara in 2020

# Results

- Jindabyne and Eucumbene sampled in February 2020

- Jindabyne for a full scan and Eucumbene partial (representative areas sampled)

- Analysis still being completed



Red=200-500mm, Green=500-700mm and Blue= >700mm
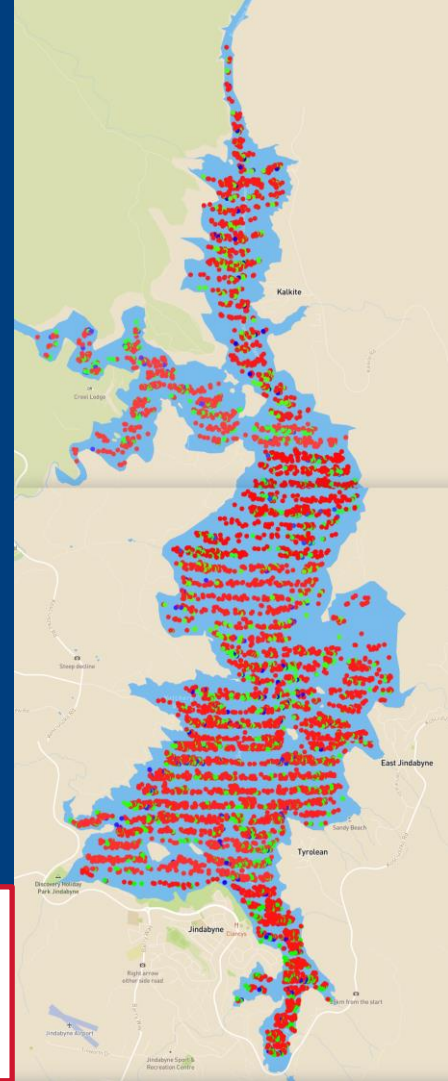
# Jindabyne-fish depth

- Blue shallow (<1m) to red deep (>25m)
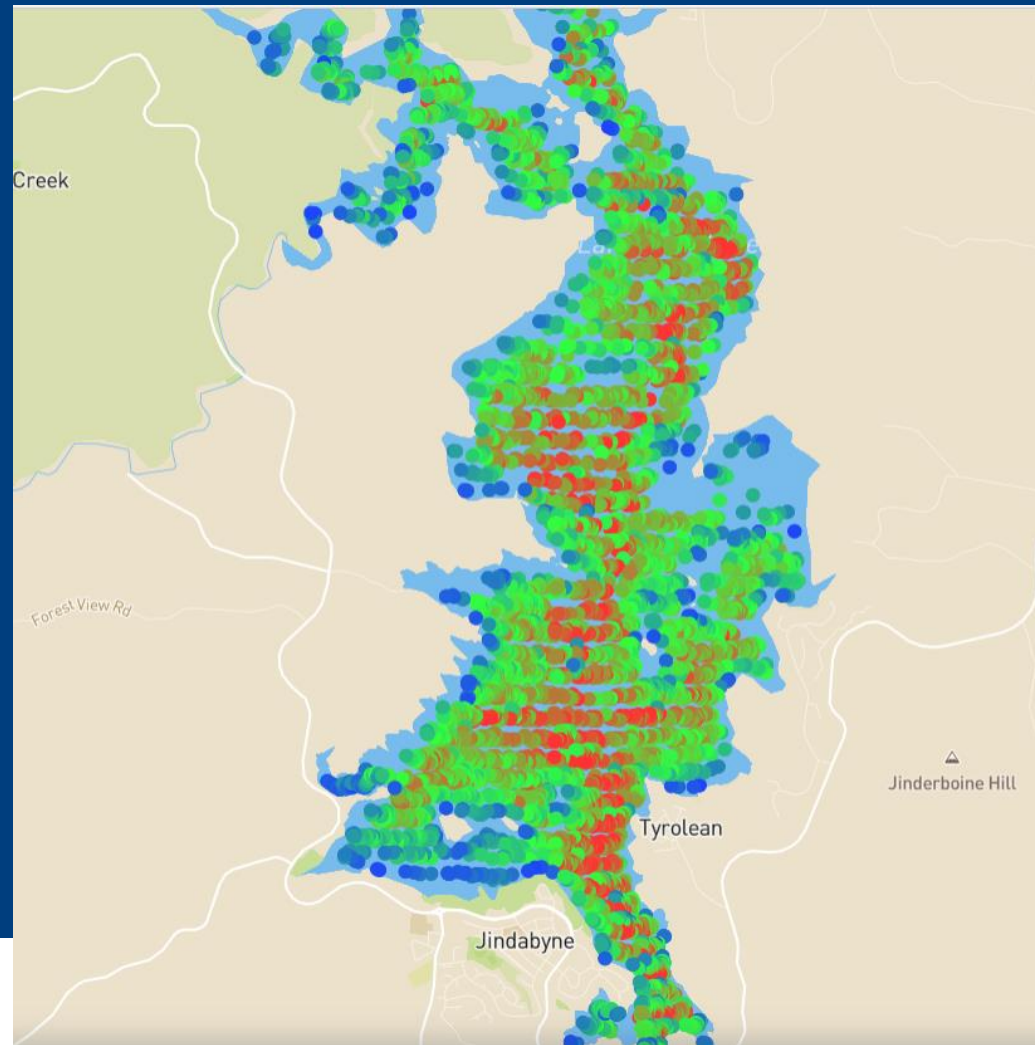
# Jindabyne

Large amount of data collected for future analysis and comaprison

# Overview

- Monitoring programs are beginning to provide robust baseline data on NSW trout fishery.

- Report cards and summary documents are available (2018/ 2019 and some for 2019/2020).

- Tag report card and spawn run report card to come later in 2020.

- **Website now available!**
https://www.dpi.nsw.gov.au/fishing/recreational/fresh-rec-fish-research/