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Wungong Catchment Trial Research Program Review

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Background

- Water Corp have supported 20 research projects associated with the Wungong thinning trial
 - specially commissioned – eg hydrology, flora, fauna, social acceptance
 - support for related programs (ALCOA, WA Museum, DEC etc)
 - external funded (Water Foundation, Australian Research Council)
- At early research forums it was evident that there was no clear overall framework for the program or links with Project Success Criteria and Key Performance Indicators (required for Conservation Commission)
- In early 2008 I was asked to review the projects to see how they may be better coordinated and linked to the PSCs and KPIs
- A report was written and reviewed at Wungong Technical Reference Group meetings, The August 2008 report included recommendations
- The KPIs were changed and projects better linked as a result of the review
- **Biodiversity** and Land and Water research meetings have been held to build links and to ensure that all KPIs have supporting data

'Research' projects reviewed - 1

No	Title	Researcher / Group
1	Hydrographic measurements	HydroSMART
2	Hydrological analysis and modelling	Water Corp
3	Hydrological processes	ALCOA
4	Groundwater monitoring	Water Corp, ND Mining Services
5	Prescribed fire and stream quantity and quality	Rick Sneeuwjagt, DEC
6	Monitoring the effects of wildfire on water, vegetation and biodiversity	Frank Batini and Keith Barrett
7	Vegetation dynamics and water yield under changing climate and management	CSIRO - Richie Silberstein, Jeremy Wallace
8	Remote sensing	Water Corp – Mike Canci, Specterra
9	Leaf Area Index	Water Corp
10	The impact of forest thinning techniques on perceptions of recreational value and ecosystem health	Jo Ann Beckwith and Susan Moore

'Research' projects reviewed - 2

No	Title	Researcher / Group
11	Demonstration / Information sites	Frank Batini and Richard Boykett
12	Sapflow measurements to answer tree water use questions	Richard Silberstein, Craig Macfarlane and Don White
13	Vegetation monitoring program	Libby Mattiske
14	Fauna monitoring plots and fauna monitoring programs	Dave Kabay
15	Community-based study of fungi biodiversity in the Wungong Region	Roz Hart, Neal Bougher and Margaret Larke
16	FORESTCHECK	Richard Robinson and Lachie McCaw
17	Monitoring dieback in the Wungong Catchment	Mike Stukely, Frank Batini and Greg Strelein
18	Monitoring Cockatoo, Avifauna and Ground Vertebrates	Ron Johnstone and Tony Kirkby
19	Aquatic fauna biodiversity assessment	Andrew Storey
20	Balancing water quality and ecosystem health with water yield – ecosystem response to thinning in Wungong Catchment	Richard Bell and Qui Song

Project Success Criteria – high level

- The social acceptability and cost effectiveness of thinning hills catchments to improve water yields relative to the do nothing different case will be sufficiently well known to enable a decision to be made whether to continue treatment of the Wungong Catchment, and to extend it to other catchments.
- A 20% increase in runoff in the Wungong Catchment following the approved silvicultural treatment relative to the “do nothing different” case.
- Stakeholder acceptance of the forest structure after the approved silvicultural treatment.
- No significant adverse impact on terrestrial and in-stream ecosystem functions following the approved silvicultural treatment relative to the “do nothing different” case.
- Impact on ecosystems’ ability to adapt to climate change improved as a result of the approved silvicultural treatment.

Project KPIs – main land and water KPIs in black; biodiversity in green; socio-economic in red

1. Stream water quality and quantity
2. Safe handling of herbicides
3. Efficacy of herbicide treatment
4. Achievement of retained basal areas
5. Level of damage in retained stems
6. Efficacy of burn prescriptions
7. Soil protection
8. Increased growth and yield due to thinning
9. Dieback
10. Changes in stream invertebrates
11. Changes in the status of threatened fauna species
12. Changes in the status of threatened flora and ecological communities
13. Changes in overstorey composition
14. Consultation and communications
15. Community understanding and social acceptability of catchment thinning
16. Cost effectiveness of catchment thinning

Groups that may benefit from interaction

Remote sensing

- Vegetation dynamics and water yield under changing climate and management
Richie Silberstein
- Remote sensing
Mike Canci, Specterra, Urban Monitor
- Leaf Area Index
Water Corp

Hydrological modelling

- Hydrological analysis and modelling
Water Corp
- Hydrological processes
ALCOA
- Vegetation dynamics and water yield under changing climate and management
CSIRO, Richie Silberstein

Leaf Area Indices

- Vegetation dynamics and water yield under changing climate and management
Richie Silberstein
- Leaf Area Index
Water Corp

Integrated systems modelling

- Vegetation dynamics and water yield under changing climate and management
Richie Silberstein
- Balancing water quality and ecosystem health with water yield – ecosystem response to thinning in Wungong Catchment
Richard Bell and Qui Song

Conclusions

- The **Biodiversity** and Land and Water working groups need to continue to meet and share results and data where appropriate.
- The annual Wungong Research Forums allow these groups to know of each other's work, as well as link with the **Socio-economic** projects
- All research is able to be reviewed by Wungong Technical Reference Group
- Some flexibility in the program is required because:
 - Research findings may need to be expanded or confirmed
 - Regulators, politicians, Water Corp Board etc may require additional work – e.g. carbon balances
 - Other work may need to be linked – e.g. SWSY regional hydrology, NCAS
- Long term monitoring after treatments is essential along with good process understanding so that trends may be discerned and extrapolated early. Some projects are ending in the next 1 – 2 years
- Were the Wungong project to end then there would not be a mechanism to coordinate jarrah forest hydrology research