NATIONAL PARKS ASSOCIATION OF NSW

protecting nature through community action

Armidale Branch
[redacted]

13 October 2024

Stef Schulte
Principal Advisor
Natural Resources Commission
Level 6, 52 Martin Place, Sydney NSW 2

By email to: nrc@nrc.nsw.gov.au

Dear Ms Schulte

REVIEW OF WATER SHARING PLAN FOR THE MACLEAY WATER SOURCES

The National Parks Association of NSW (NPA) appreciates the opportunity to contribute comments on the Water Sharing Plans (WSPs) currently being reviewed by NRC including that for the Macleay Unregulated and Alluvial Water Sources 2016. We note that the Water Sharing Plans that commenced in 2016 had many similarities as well as elements specific to particular water sources. This submission focuses on the Macleay WSP but it of some relevance to other WSPs under review.

NPA's mission is protecting nature through community action. Our strengths include State-wide reach, deep local knowledge, evidence-based input to policy and planning, and over 65 years' commitment to advancing the NSW protected area network and its professional management. We also provide outstanding opportunities to experience and learn about nature through diverse outdoor activities.

The Armidale Branch of NPA has been dedicated for 50 years to protecting and appreciating nature across the landscapes of the Northern Tablelands and surrounding region on public and private lands.

General position

The objectives of our society to sustain both our own species depend on good management of water throughout NSW. Nature cannot be adequately conserved on protected lands without also considering the impacts of external factors affecting those lands and the water needs of life within reserved areas, only some of which are met by local rainfall: many of the biota in our existing protected areas depend on inflows from upstream sub-catchments. Similarly, many fish and other aquatic species, cannot be adequately conserved by our national parks system, because too little of their preferred habitats are conserved in this system, their populations are already severely diminished or because they depend on being able to move over long distances, even out to sea and back upstream or to and from floodplain wetlands. We recognise that all native species that depend to some extent on stream flows have evolved with the natural variability of stream flows and that many therefore depend on aspects of natural flow regimes, such as the periods of low or no flow having always been of limited duration and frequency. Flow management also affects water quality. NPA is therefore concerned that all waters should be well regulated under the Water Management Act 2000 and Water Sharing Plans. This Act appropriately sets principles that prioritise protecting water for the environment, along with basic rights for domestic and stock use, ahead of licensed water extraction or use, except in times such as extreme droughts when town water supply access licences have higher priority than the environment, so this submission considers whether the WSP is in effect following these principles.

The time required to understand and comment in relation to outcomes that could be ascribed to the Macleay WSP, its objectives and on changes needed in a replacement WSP is considerable. I have not

been able to assemble comments on other WSPs under review in the timeframe provided for submissions. Some of the points raised in this submission would also be applicable to other WSPs. For example, NPA is equally concerned that water sources in the Clarence catchment should not be diminished, particularly in times of drought, because wildlife in Guy Fawkes River National Park, the many other protected areas, and in unreserved aquatic, riparian, groundwater-dependent and estuarine ecosystems depend on tributaries of the Big River, either directly, as presence of water, or through the environmental roles that small flows, freshes or floods in and from them perform. The size of the river at Grafton or the volume of its floods do not mean that there is plenty for the taking.

A Extent to which the plan has contributed to environmental outcomes

Study shows poor river health

Staff of the University of New England undertook a study of the Ecohealth of the Macleay river system. A report of the study, in folded A3 brochure format, was published in 2016, available here[1]. This gave a good overview of the health of the river and most tributaries, although being partly funded by Kempsey Shire Council, it included more sampling points in that shire than in the upper catchment. Indicators of 4 or, where possible, 5 aspects of Ecohealth were studied. It is not a rosy report. None of the tributaries attained an A rating on all aspects, the Styx achieved the best overall rating, B-, while Commissioners Waters, Salisbury Waters, and Tia River were failed: F. Gara River and Collombatti Creek were little better: D. Many sites scored OK on some indicators but poorly on others. While many factors have contributed to the limited health or poor condition of the rivers, water use and management will have been a significant factor in some places.

Earlier "Stressed Rivers" studies had shown that streams such as Commissioners Waters and the Apsley were hydrologically and ecologically stressed, resulting in preparation of the WSPS for these streams that preceded the Macleay 2016 WSP. Just as the Commissioners Waters WSP was not a rapid cure for that stream's problems, it would be unrealistic to expect that the 2016 WSP will have solved the hydrologic component of the poor Ecohealth demonstrated at the time of its commencement.

I have not come across any similar more recent studies. DPIE surface water scientists may undertake similar studies in the Macleay at some time, and Fisheries staff may have assessed some of the fish populations. Armidale Council decided to support a similar but more detailed study in the Gara catchment that may have commenced[1].

Effects of severe drought and water use in 2018-20

Since WSP commenced in a period of alternating dry and more normal conditions that was followed by severe hot drought of 2018 and 2019, ended by prolonged gentle rain in some locations such as Armidale but by extreme rainfall in the east of the catchment in early 2020. Seasons have been mostly wet since then. Everything and everyone depending on water was stressed by the extreme drought. For example, Guyra residents were encouraged to conserve water then had water restrictions from winter 2018 onward, Armidale people were allowed to use as much as they wished through the summer of 2018-19 but restricted from March 2019 until March 2021 when Malpas dam filled (both towns were under Level 5 much of this time). There was no outflow below Malpas Dam for most of this period because the section[2] 28 of the WSP conditions only require releases when the dam level is above 55%. Before this, any outflows not drunk by stock and wildlife along the river or extracted for domestic, stock and licenced use or used up by the environment (e.g. for the essential process of evaporation which limits warming of the water) could have reached Council's Gara Dam. There are no conditions requiring releases from this dam but little is used as an untreated water supply to a few users and some must be retained for stock in the travelling stock reserve surrounding the dam. A trickle may have overflowed, or a brief rise from rare stormflow from the sub-catchment below Malpas. However, for about 3 years, Gara River had significantly diminished flow, mostly due to Malpas trapping such runoff as

[1] Contact Dr Sara Mika [redacted] for details and advise on hydrological stress indications.
[2] All references to sections in this submission are to sections of the Macleay WSP unless otherwise stated.

occurred in its part of the catchment. The conditions requiring some releases when the dam is above 55% meet only some low flow needs, not the need for higher flows (e.g. to improve water quality, clean algae off rocks and extend the productive area of riffle zones).

Gara River's next major tributary, Commissioners Waters, was also under increased stress due to extractive uses. Outflows from Armidale's sewage treatment works down Commissioners Waters were avoided or minimised[3], presumably in accordance with EPA licence conditions, by use of the treated effluent on site for production of irrigated fodder.

Oxley Wild Rivers National Park[4] depends on flows from **this and all** the other rivers in the upper parts of the Macleay catchment. While the shortage of rain and the effects of high temperatures on runoff and evaporation would have caused major reductions of flows in every tributary through 2018 and 2019, extractive water uses exacerbated this. The Gara River's contribution to the "Wild Rivers" national park ecosystems is always reduced by supplying Guyra and Armidale's demand, but was greatly reduced for about 14 extra months until sufficient rain fell to both meet Armidale's demands and refill the dam so it could finally overflow and let a flush of water go down the river.

While no other tributaries have a large dam that significantly extended the drought, others also have substantial demands from stock, particularly cattle which drink a lot more than sheep or native wildlife, and from irrigation (mostly of fodder crops). While irrigation is small in area, fodder was invaluable. The shares allocated to unregulated access licences indicate that the volumes of water that may be taken are substantial. Most licensees would have made as much use of the limited flows as they could, leaving less for the environment than normally happens in years with more flows – less at times when some species are in most need of river water to drink.

Please see the **attached spreadsheet** which is part of this submission. In it I have assembled from sections 20 to 27 of the WSP. It shows that the long-term average volume which the WSP permits to be extracted from upstream of various parts of Oxley Wild Rivers National Park is **17,025 ML/year**. Armidale Council has by far the largest share, 7631 ML/year.

The table below shows that Armidale did not use anything like its full share even in 2018-19 when few residents (only those in Guyra) were under any water restrictions during the hot dry summer. This was the year of our highest ever water use. If our use was entirely unrestricted it would have been slightly higher. As the possibility of another year or more of this drought and need to conserve water sunk in, restrictions were introduced and soon became Level 5.

Total water sourced	2018/19 ML	Weather, drought restrictions	2019/20 ML	Weather, drought restrictions	2022/23 ML	Weather, drought restrictions
Armidale (licences permit 7,631 ML/yr)	4204	Hot & dry. Level 1 from March, Level 3 from 23 April then Level 4 (+Guyra Level 1-2 July-Feb)	2255	V Hot & dry until Xmas. Level 4-5 all year and continuing into March 2021	3722	More normal. None
Kempsey (licences 10,141 ML/yr)	4333	Hot & dry. Level 1-2 for last 41 days	6513	V Hot & dry until mid-Jan. Restrictions Level 1-3 70% of yr	3008	More normal. None

Water sourced for treatment then supply by two Councils from https://water.dpie.nsw.gov.au/our-work/local-water-utilities/local-water-utility-performance. Restrictions from Councils' documents.

[3] EPA licence conditions include the environmental objective of not causing the stream to stay wet when it would naturally dry up. I don't know the details of what effects the operation of the STP and effluent irrigation together with licensed extract had on flows and the environment in practice relative to what might have happened in this drought without the various water management conditions.

[4] See this map: https://www.nationalparks.nsw.gov.au/-/media/npws/maps/pdfs/parks/oxley-wild-rivers-national-park/oxley-wild-rivers-national-park-map.pdf

The Council did a great job in encouraging people to use less without blaming and deterring the bigger users. It was inconvenient for all who were not already minimalist users, and very inconvenient or awful for some, including some businesses. Note how much lower our use was in 2019-20. Some permanent changes were made (e.g. to not use town water on the university's playing fields) but few were of the types that require capital expenditure or introduction over time. Most of the great reduction was achieved by temporarily not watering grass or gardens directly from taps and temporary behaviour changes. Some people have continued some of the water-saving behaviours they adopted, but there has not been a hot or dry summer since to enable us to find out how much our per-capita unrestricted use might have decreased. Council did briefly introduce level 1 restrictions at a much higher dam level than they were previously introduced. The idea of being on Level doesn't phase anyone. Yet Council's planning is all based on assuming that our future use will be at the high unrestricted 2018-19 level.

Many other licensees may not have been able to take their full allocation in the worst year of drought due to lack of flows, although they will have used all they could pump when there was flow. It is possible that some used more than one year's share in a year.

This use is in addition to the harvesting of water in farm dams, mostly on minor streams but also in some larger farm dams such as one on Salisbury Waters. Harvesting of even 10% of the rain that falls on a property in addition to that which is absorbed by the soil and taken up by plants, has significant effects.

Just as stock depended through the drought on declining water supplies, so did many species of birds, terrestrial mammals and frogs as well as fish, turtles, the aquatic invertebrates that platypus and most fish need as food, and other aquatic species. When trees and other terrestrial plants were losing not growing leaves, let alone flowering, more animals than usual have to seek water in remnant pools, even koalas, so ecosystem dependence on inflowing rivers and creeks is wider than the narrow aquatic and strips. The populations of these species and resilience of the ecosystems would have been severely impacted by the drought (then bushfires), and was probably further reduced by upstream extraction reducing the frequency, duration, depth and width of flows.

How did WSP provisions affect outcomes in this drought and in other seasons?

The terminology of Part 5 "requirements for water" proved to be a misnomer. People have survived without necessarily using this much water, even through the 2017-2020 drought, Armidale and Kempsey being clear examples. Most people in the many smaller communities also survived. This drought in this area, as in many others, was an awful experience, apparently contributed to some suicides and early deaths, and may have caused some people to move away to find employment or a home where shortage of water was less serious.

However, the numbers of megalitres or unit shares listed in sections 20 to 27 of this WSP had little if any influence on this because there was so little water then plenty of rain.

What did influence the outcomes of the drought were the concepts of sharing the limited amount of water actually available, and of complying with licence conditions, social norms, Council restrictions and choosing household or personal constraints to limit the impacts of the drought on other people, and to care for what environmental values might thus be able to survive (like some fish having a pool to survive in or some starving wildlife having somewhere to drink). While stock numbers and some water-dependent businesses were severely affected, most people found ways to get by or realized that much water use is a want not a need, not a requirement. Many affected business have recovered, communities have tried to learn from the drought and strengthen themselves, and economies have changed, hopefully with a bit more drought resilience.

The provisions in the WSP allow for accounting over 3 consecutive years. This permits much higher volumes to be taken if and when flows occur, though limited by pump size and other constraints. In theory unregulated river access licence holders could use up to 3 years' share in 1 year plus any carried over from the year before a 3 year period. There has been a trend, before and after this drought, towards enabling more water to be captured or extracted, stored and used on farms. The year's when high use is most likely would be those when a dry period is followed by repeated hot weather from

spring to autumn that maximise demand for stock water and fodder /crop irrigation plus many runoff producing rainfall events enabling extraction – this may not have occurred since the 2016 WSP commenced but could be increasingly likely due to global warming.

Granting of new licences

I do not know whether the access licences existing when the plan was granted, with or without any granted since, have water entitlements that total the volumes of the long-term average extraction limits for each water source, or whether some of those limits were intentionally set higher than the sum of existing entitlements to enable more to be granted. I do not know whether new access licences have been or can be granted, other than those enabled by sections 40 and 41. It appears not. S.30 would not in practice specify any LTAAE limits if new access licence shares could be created. Given the stresses that wildlife and ecosystems dependent on flows in the streams are under already, creation of additional shares should not be possible. Trading of existing share components is permissible within limits, and I presume that licences can also be transferred between landowners (not to mention speculators). This enables social and economic change, such as people profiting from improving the efficiency of their water use then selling what they don't need to someone else.

Trading or dealing in water shares

It is good that some streams appear to have been identified into which trading is not permitted (s. 61 (2) (b)).

Trading should not be permitted into water sources with a current limit of 0 – keep their flows as natural as possible throughout their course for the benefit of their surviving aquatic and riparian ecosystems and contributions to downstream flow, rather than allowing moving of impacts into these relatively natural streams. Nor should any transfers be permissible into streams that have been identified as showing hydrological stress, whether by the University of New England during in its Macleay Catchment Ecohealth study in 2016[5] or more recent studies, by DPIE's surface water scientists, or by consultants.

I note that most of the limits on trading into water sources where this is permitted by s. 63 (2) match the volumes in s.25 for unregulated access licences. However, some exceed the limits set by s.25: the two I noticed are Oaky River (221 instead of 55) and Nulla Nulla Creek (230 instead of 66). Is there any basis for permitting increased extraction in either? The transfer of additional shares to Nulla Nulla Creek would reduce actual water availability for the town water supply to Bellbrook unless transferred to downstream of that supply's offtake.

Armidale Branch of NPA has a strong view that **no increase in extraction from the Styx River** should be permissible, because it is so greatly valued by people in communities of the Macleay region and people who live elsewhere for many different reasons, such as being able to swim there in droughts, catch fish there, for providing very important clean sustained and frequent flows into the Macleay when few other tributaries do, and as a wild river (above and flowing into the Oxley "Wild Rivers" National Park and conservation area).

Environmental issues in the eastern half of the Macleay catchment

The reduction of flows in the upper catchment also affects environmental values and people in the Macleay Valley below OWR National Park.

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[5] Contact Dr Sara Mika [redacted] for details and advise on hydrological stress indications. This study was done before the 2019-20 bushfires and extreme rainfall after the drought and fires caused serious changes in some sub-catchments and parts of the main river. The brochure showing indicators of the Ecohealth of each sub-catchment can be found here https://www.une.edu.au/about-une/faculty-of-science-agriculture-business-and-law/school-of-environmental-and-rural-science/research/life-earth-and-environment/aquatic-ecology-and-restoration-research-group/recent-publications. Similar more detailed studies may have been undertaken in parts of the Gara River sub-catchment.

A particular problem that is being well studied in the Macleay is the ongoing effects of historic mining in the catchment on concentrations of **toxic metals** that continue to be released from old mine sites near Hillgrove into Bakers Creek and from Halls Peak into the Chandler and mobilised from sediments downstream. The toxic metals are a problem for aquatic species as well as for people. Much work on this problem has been done by Dr Sue Wilson and her students at the university of New England. A recent study led by Professor Scott Johnston of Southern Cross University has found that flows have important effects on mobilisation of both metals[6]. Arsenic levels increase with water temperature, an effect that is less noticeable when higher base flows dilute the metal. Higher flows may also tend to limit warming of the water and therefore mobilisation. Antimony levels, which exceeded drinking water standards 17 times during this study, are not related to temperature but related to flow in complex ways and "dilution matters a lot". Consequently, the amounts of water taken from any tributary of the Macleay, other than during short periods of high flow, affects the toxic metal levels that affect people and various susceptible biota downstream of the mine sites, including down to Kempsey.

The water use permitted by the WSP will sometimes have contributed, at least slightly, to higher toxic metal concentrations in the remaining water. I suggest you seek more information to assess how significant this issue might be and what changes to the WSP might be appropriate to limit this impact.

Some river reaches have certainly changed as a result of the severe drought, bushfires and extreme rainfall in the east of the catchment in early 2020. I understand that these circumstances combined to contribute a slug of sediment to the rivers including part of the Macleay that will have lasting effects on its river bed (presumably smothering riffles and filling pools) and on river health. This may affect the reliability of river flow gauges and/or the appropriateness of some licence conditions.

B Changes needed to the water sharing plan to improve outcomes

This review of WSPs is a timely opportunity to learn from recent experiences and recommend ways to improve water management and better enable people and the environmental values of the respective river and groundwater systems to survive climate change. The climate predictions and modelling published in the Regional Water Strategy demonstrate the importance of preparing.

Improving the rules

This WSP provides only limited and inadequate protection of flows for the environment. It does provide more protection of very low flows in many tributaries than some other WSPs where most licences have conditions that only protect water in pools by permitting extraction whenever there is any visible flow and thus allow extraction of very low flows. This is the case for some licences in this WSP. It means that flows may not reach and refill pools further downstream. Low flows, or **at least very low flows, should be protected in all rivers and creeks**. It should be possible to do this in old or innovative ways that do not require installation and maintenance of digital gauges on every tributary.

Whenever there has been little or only very low flow for a significant period **the next higher flow or should be protected**. The period and what low flow or volume triggers the application of the rule should be set in relation to the natural characteristics of each water source. This could be thought of as a "first flush" rule but should apply in each dry period as a protective measure, not just at what might be the end of a long drought, and need not involve protecting the whole of a large flush – aiming to protect either a volume or a small rise in flow for a few days (whichever happens first, or whichever is most practical in a particular location) might achieve benefits for both the environment and downstream users. This may or may not be achievable purely by written rules, the alternative being rules that have clear objectives and are implemented by temporary suspensions.

Armidale Regional Council supply ambitions

[6] A summary of the results can be seen here: https://saveourmacleayriver.com/wp-content/uploads/2024/08/1_Macleay-Forum_Antimony-and-Arsenic_Aug24.pdf

Armidale's Council used to claim people could come here because we had plenty of water. They knew that Malpas Dam was designed with an option of doubling its volume in mind so when the need to introduce restrictions this was investigated. A new Council adopted an ambition for economic and population growth in excess of that predicted by the State Government and wanted to increase water supplies to meet enable the population it hoped for in about 25 years to be supplied at the per-capita rate consumed in 2018/19. Public Works Advisory produced a report investigating alternative sources and recommended that Council pursue the idea of repairing a disused broken hydroelectric dam on the Oaky River and constructing a pipeline to pump water from the Oaky dam to Armidale water treatment works, then later raising Malpas dam's spillway to meet more demand. The water level in Malpas dam has to be halved for a about a year to raise the spillway, necessitating water restrictions. Council bought the Oaky River dam and undertook detailed investigations of the costs of refurbishing it and of the pipeline. They turn out to be far more expensive than had been predicted (Council hopes to get public funds from State or Commonwealth coffers or private $ to pay for it).[7]

When a local community group asked in a submission to Council that they develop a demand management strategy to investigated the range of ways that Council and community demand could be reduced and how the community could be assisted in limiting per-capita demand, the answer was that this would be done after expanded water supplies were made available.

If Malpas Dam is enlarged, which is a less expensive way to improve security, than the proposed Oaky source, the rules relating to outflows from the dam, which are in the WSP, should be publicly reviewed with a view to improving environmental outcomes, including when a drought starts to ease but the dam effectively extends the drought for the river downstream.

We are greatly concerned that the environmental effects of supplying the predicted increased demand are not being considered or discussed. The current WSP would not allow use of Oaky River to supply a fraction of Armidale's demand. It should not be simply changed to meet Council's wishes. While the current WSP allocates far more water to Armidale than we have used, the rivers are already seriously stress by the current level of use. The stress on another tributary of the Macleay should not be increased (even though it has endured some past damage). Increasing supply to Armidale and new users would still impact on the Macleay River whichever tributaries it comes from.

Armidale Regional Council promotion of horticulture

The Costa Group established a large tomato production facility supplied with water for irrigation by the former Guyra Shire from its limited town water supply. This is apparently not prohibited under the existing town water supply licence which did not a have a subcategory. Such horticultural production uses substantially more water than the little bit of pasture previously on the site, notably during a hot drought. It greatly increased Guyra water use until production had to be stopped. It contributed to Guyra nearly running out of water before a pipeline from Malpas Dam was constructed. I understand that continued supply to the tomato farm through the treated water mains is permissible, direct supply from the untreated pipeline was not.

A second tomato farm was then being built at Guyra by Costa Group, designed to capture as much runoff from greenhouse rooves and their surroundings as possible to and combined with such other water sources as were obtained. It has demonstrated that businesses with capital can focus on maximising their water harvest. While this might be applicable to many agricultural businesses it is particularly relevant to horticulture from which high returns are possible.

The 2 Guyra tomato farms seem to have given Armidale Regional Council the idea that encouraging more intensive horticulture will be the major means to achieve their desires for ambitious growth of the local economy, ongoing jobs and population (renewable energy developments being useful but involving few ongoing jobs). Council's 2024 Local Strategic Planning Statement aims for 125 ha of glasshouses and identifies potential locations for them near Guyra above Malpas Dam and near Commissioners Waters.

[7] I can provide some references relating to this paragraph

Where the water for horticulture through dry years will come from is not clear – potential sources that have been mentioned include use of highly treated sewage effluent and Council's largely disused small town water supply dam on Gara River east of Armidale[8]. It may or may not be possible to find some groundwater from underlying fractured rock but it is not widely thought of as a suitable source. Existing unregulated licences could be traded within the constraints of the future WSP but might meet little of the new demand. There may be pressure to increase the available shares. If a significant proportion of Armidale's future water needs can be met from Oaky River, more of the Malpas dam supply might be available for more glasshouses there. Presumable harvesting rights would be a significant source.

We are concerned that the cumulative impacts of water demand on downstream environments are not being considered.

While harvesting 10% is considered a right, protection of water for the environment must be through limits on licensed use. If use of this "right" is substantially increased in water sources that already have very poor river Ecohealth due in part to hydrological stress associated with licensed use, including Malpas, Gara and Commissioners Waters sources, the risks to the environment should be reduced by reducing the share of water available to licensed users.

LTAAELs

The Water Management Act principles prioritise some uses in times of shortage that could be regarded as requirements – basic rights and town water, but do not treat access to water for other licensed uses as requirements – not as volumes required to be available – not even in regulated systems. They require environmental needs to be given priority over those other licensed uses. The extent to which the numbers set as "requirements" in Divisions 2 and 3 may have been limited in order to leave some "planned environmental water" (as per s.18) is rather opaque, except in relation to the Coastal Macleay Floodplain Alluvial Groundwater Source.

NRC could review the appropriateness of LTAAEL volumes across the catchment. If volumes set were smaller, perhaps flows would be sustained for longer in dryish periods or might sustain the presence of alluvial water within reach of riparian trees for longer. If they were set too large, many dry periods and some normal seasons would be artificially like a drought for the aquatic environment because its needs could not be met so its ecosystems or populations would gradually lose the resilience needed to properly recover from real major droughts, as has happened in many over-used inland streams. A precautionary approach that seeks to protect the environment should be taken in reviewing the LTAAELs and associated rules. All available studies and data should be used.

We trust that any shortage of records of actual use, the limitations of the gauge network or of modelling data will not prevent the Commission recommending improvements to avoid further deterioration of our water-dependent environment.

I can be contacted by phone on [redacted] or at [redacted]

Yours sincerely

Kate Boyd

Armidale Branch Committee member
National Parks Association of NSW
protecting nature through community action

[8] Councils work plan for 2023-24 included investigating alternative use of this dam. I note that a section of the Act regarding dealings does not permit certain type of dealing if it would reduce town water supply shares, however I have not asked Council what their investigations found.