



I N L A N D  
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N E T W O R K

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Submitted Online

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## **SUBMISSION**

### **Floodplain harvesting licence rules in the water sharing plans for the Macquarie Valley**

#### **Introduction:**

The Inland Rivers Network (IRN) is a coalition of environment groups and individuals that has been advocating for healthy rivers, wetlands and groundwater in the Murray-Darling Basin since 1991.

IRN welcomes the opportunity to engage in the process of regulating access to floodplain flows in the Macquarie River Valley.

The management of NSW water resources is the most important responsibility of the NSW and Federal Governments. Water is a scarce resource in Australia, more than any other inhabited continent on earth. The Macquarie River system is significant in that it supports important First Nations cultural values as well as the internationally significant Macquarie Marshes, with associated obligations under the Ramsar Treaty. Over the long term, twenty one percent of the flows in the Barwon-Darling come from the Macquarie-Castlereagh catchment.

This submission will discuss the proposed water sharing plan (WSP) rules proposed, as well as discuss a number of key concerns with the process for assessing and regulating Floodplain Harvesting (FPH) in the Macquarie Valley.

Those key concerns are:

- Modelling
- Plan Limit and Cap
- Tailwater/Rainfall runoff Exemption
- Environmental Outcomes
- Carryover
- Consultation

By proposing that no reduction in current FPH diversions is necessary in the Macquarie, the NSW Government is prioritising irrigation practices over higher priority needs. Such prioritisation is inconsistent with the priority of use provisions in the Water Management Act 2000 (WMA) (ss. 5(3) and 9(1)).

The proposed rules for managing FPH in the Macquarie Valley will not protect any flood flows to improve connectivity with the Barwon-Darling/Baaka or to the Ramsar listed Macquarie Marshes. No attempt at all is being made to mitigate the damage caused by the last 30 years of free, unregulated take of FPH.

The claim by the Government that extraction in the Macquarie Valley is under the Sustainable Diversion Limit (SDL) even when FPH diversions are included must be backed up by clear evidence for the sake of community confidence. IRN considers the information provided in the various reports regarding new plan limit and Cap scenarios is deliberately obtuse and often contradictory.

We find it unacceptable that the IQQM modelled estimate for FPH in the Macquarie Water Sharing Plan was zero, and yet 62,791 ML per year (inc tailwater/rainfall run off) could be licenced.

A high number of ineligible FPH works have been identified in the Macquarie Valley, however there is no information provided about the volumes of water that are involved with these works. It is not clear if the Government will consider retrospective approvals in any of these cases.

There is no clear evidence of a process to remove unauthorised works that impact on flood flows, as identified in the draft Floodplain Management Plan (FPM). IRN is concerned that a final Macquarie FPM is still to be gazetted.

We have serious doubts about the integrity of the model used to assess the volume of FPH for licencing in the Macquarie Valley and consider that the process is biased towards industry outcomes rather than addressing the significant downstream social and environmental impacts.

## Summary recommendations for rules:

### 1. Account Management

One year account management with no carryover.

### 2. Initial Available Water Determination

Initial allocation no more than 1ML per share unit at any time. No carry over.

### 3. Permanent Trade

Support the establishment of seven trading zones, and the prohibition of permanent trade into areas with sensitive environmental and cultural values.

### 4. Granting or amending water supply works nominated by a floodplain harvesting (regulated river) access licence

There should be no new works, or modifications of works that would increase FPH capacity approved in any zone.

### 5. Access Rules

Support prohibiting access until downstream flow targets are met.

### 6. Active Management

Support the use of active management rules to protect Held Environmental Water (HEW), however all HEW must be protected.

### 7. Environmental Flow Rules

Object to no rules being proposed to protect active environmental water allowance

### 8. Amendment provisions

Support amendment rules as proposed to support adaptive management.

## Discussion of proposed rules:

### 1. Account Management

IRN strongly supports annual accounting for FPH with no carryover. We do not agree with DPIE-Water position that this method of account management will lead to greater environmental impacts and growth in use.

If NSW want to protect against future growth in FPH diversions, other options could be considered such as not approving any new FPH works or modifications that increase take, or reducing the available water determinations (AWD).

Under the proposed five year accounting system with carryover up to 500%, growth in use through permanent trading is likely to be greater than under a one year accounting system.

The NSW Government know the impact climate change is expected to have on flood behaviour in the Macquarie Valley through the new robust climate/hydrologic datasets

developed by DPIE last year. The change in seasonality of rainfall is already being experienced.

The flood data used to inform the FPH account management rules stops in 2009, and describes a time when there were more frequent small to medium floods than are expected in the future.

The Healthy Floodplains team have presented to the public on several occasions showing their assessment that the 5 year accounting model would be less impactful on the environment than the one year accounting model. The argument is that medium size floods that might follow a larger flood would not be as vulnerable to FPH take if FPH account balances have been reduced due to the take from the larger flood.

The Healthy Floodplains team claimed that the smaller floods that follow a large flood have greater ecological value than the preceding larger flood (undoubtedly because the majority of the larger flood was harvested).

In a future with a reduced frequency of floods, but when they do occur, significantly higher flood flows, five year accounting rules with up to 500% carryover will allow more water to be harvested than 1 year accounting with no carryover.

## **2. Initial Available Water Determination**

IRN strongly opposes an initial available water determination of 5 ML per unit share. This is a bonus to the irrigation industry that will deprive downstream communities and environment from access to important flood flows.

IRN supports an initial available water determination of 1 ML per unit share to maintain consistency across all Northern Valleys.

The unit shares being proposed for licencing 62,791 (including tailwater/rainfall runoff) are based on extremely poor data inputs into the model.

As stated by Alluvium: *“We note the statements in the report that the uncertainty in individual FPH take estimates (leading to entitlements) is still **significant** and measurement data is needed to improve on that.”*<sup>1</sup>

As it is a certainty that the shares issued will be significantly inaccurate, issuing an initial AWD of more than one would be taking the favouritism that DPIE Water show to irrigators<sup>2</sup> to extreme lengths.

## **3. Permanent Trade**

While IRN does not support trading of FPH licences, we understand that trade of water entitlements is required under the Basin Plan. We support that only permanent trades of FPH licenses is allowable.

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<sup>1</sup> [https://www.industry.nsw.gov.au/\\_data/assets/pdf\\_file/0008/357956/final-summary.pdf](https://www.industry.nsw.gov.au/_data/assets/pdf_file/0008/357956/final-summary.pdf)

<sup>2</sup> ICAC Investigation into complaints of corruption in the management of water in NSW and systematic non-compliance with the Water Management Act 2000 – November 2020.

IRN supports the proposed trading rules that state:

- No new works located in management zones A or D as specified in the (as yet un-gazetted) Floodplain Management Plan for the Macquarie Valley Floodplain 2021.
- No modifications to works located in management zones A or D if the modification would result in an increase in capacity for that work.
- No new or modified works outside management zones A and D if the construction or modification would result in an increased rate of take for works located in management zone A or D.

IRN considers that all zones on the floodplain contain important ecological and cultural values. Trading into any zone will increase the level of flood flow interception in that zone.

#### **4. Granting or amending water supply works nominated by a floodplain harvesting (regulated river) access licence**

There were a very high number of applications for FPH access that were deemed ineligible in the Macquarie Valley – 28 out of 106 applications.

IRN considers that:

- the capacity of these 28 illegal works needs to be made public
- DPIE Water must guarantee that these works will be decommissioned
- DPIE Water must guarantee that these illegal works will not be retrospectively approved
- DPIE must calculate the volume of water denied to the environment by these illegal works over their lifetime, and reduce the total volume of FPH licences by that volume

There are conflicting statements throughout the provided documents about the potential for growth in FPH in the Macquarie Valley, which gives room for irrigators who wish to expand their take of FPH reason to think that they can.

The culture of entitlement from which a lot of Macquarie Valley irrigators see the world was clear at the FPH public consultation in Warren on 31<sup>st</sup> March 2021, with some very angry that their practice of pumping out of waterways directly onto their crops (assumedly outside of legality) may be hampered by the presence of NRAR.

Given the interest from irrigation stakeholders in public consultations in asking about the opportunities to expand FPH diversions, and the extent of the culture of entitlement in the irrigation community, IRN considers that the Department could have been much clearer about FPH diversions not being able to expand.

IRN understands that the Sustainable Diversion Limit (SDL) is a limit on extraction, not a limit on development. However, we don't see why the growth of a contentious form of take like FPH should not be limited by restricting any new development.

All existing works that are eligible for a licence must be able to allow floodwaters to pass freely without diversion or significant interruption to flow if FPH take is restricted due to the end of system targets not being met, or any other reason.

IRN agrees with the proposed rules that there be no development in zones A or D, however these restrictions will not go far enough.

IRN considers that:

- no new works approvals should be issued for FPH in the Macquarie Valley
- no modifications of existing FPH works should be allowed if the capacity of diversions would be increased
- only maintenance of existing FPH works should be allowed if the maintenance means there would be no increased diversion of water
- all licences works must allow floodwaters to pass without diversion or significantly slowing the flow for times when diversions are not permitted

## **5. Access Rules**

IRN supports Option 2 – prohibiting access until downstream flow targets are met.

The NSW Government has a legal imperative to ensure that FPH diversions are not prioritised over high priority needs as consistent with the provisions of the Water Management Act 2000 (WMA) (ss. 5(3) and 9(1)). Under these provisions ecosystem health, native title rights and basic landholder rights must take precedent over other consumptive uses.

Without the assurance that end of system targets are or are forecast to be met, IRN does not see how there is a lever in the rules that manage FPH activities that the NSW Government can use to ensure the priorities of the WMA are met.

The NSW Government must be able to ensure each flood event is managed within the law, by ensuring the prioritisation of use provisions are upheld.

All FPH structures must be able to allow floods to pass without the water being diverted or the flow impacted significantly.

Each flow target must be linked to the volume of flows required to ensure ecosystem health, native title rights and basic landholder rights are met, as is the legal requirement of the NSW Government.

This is particularly important in the Macquarie for state and federal international obligations under the Ramsar Treaty to maintain and improve the condition of the Macquarie Marshes.

## **6. Active Management**

IRN supports the use of active management rules to protect Held Environmental Water (HEW) when active management is being used to purposely create an overbank flow in a management zone where active management applies.

However, IRN objects to HEW only being protected from FPH diversion when active management conditions are at 100%. HEW includes supplementary access as well as planned releases from storage. IRN considers that rules must protect all HEW from FPH at all times.

### **7. Environmental Flow Rules**

Just as HEW can be used to create overbank flows in the Gum Cowal, Lower Macquarie Upstream and Lower Macquarie Downstream management zones, so too can environmental water allowance sub account 1 (active EWA).

Active EWA and HEW are managed together in the Macquarie Valley, therefore rules that protect HEW must also protect active EWA.

IRN recommends extending the active management application that protects HEW so that active EWA is also protected.

### **8. Amendment provisions**

IRN supports the proposed amendment provisions for the Macquarie Cudgegong regulated water sharing plan.

Proposed amendment provisions for floodplain harvesting (regulated river) access licences in the Macquarie and Cudgegong Regulated Rivers Water Source:

1. An amendment provision to add, modify or remove provisions for floodplain harvesting (regulated river) access licences:

- to allow flexibility should environmental flows be targeted to create overbank flow
- in response to monitoring, evaluation and reporting outcomes of environmental benefits from licencing floodplain harvesting
- in response to improved understanding of the influence of floodplain harvesting on downstream flows
- in response to improved integration of hydrologic and hydrodynamic model systems
- in response to a review undertaken of the existing trade rules in the Macquarie Bogan Unregulated River Water Sources

## **Modelling**

IRN strongly considers that the modelling used to determine the volumes for licence shares of FPH in the Macquarie Valley is not fit for purpose, and that compensable, tradable, mortgageable FPH licences should not be issued until significant improvements are made.

When FPH licences are issued it will be the biggest wealth shift from public to private and corporate hands since the 1990s. Estimates are the values involved could be between \$2 and \$3 billion dollars. The volumes of floodwater locked into the FPH licencing process will enshrine the ecological, cultural and socio-economic demise of the Darling-Baaka River.

Such a generational and impactful step as licencing FPH must not be done on the basis of modelling that is remarkably inadequate.

## Peer Review

IRN is concerned that only a summary of the *Review of NSW Macquarie River Valley Model Build, Scenarios and Environmental Outcomes* reports relevant to Floodplain Harvesting Policy implementation is publicly available, and that the consultants did not have access to the models themselves but only reviewed the reports.

*“As in our earlier reviews of FPH EO reports, **our review of the Macquarie FPH EO Report has not included perusing the references used nor have we been provided with the detailed modelling data for the two modelled scenarios** (the current situation without implementation of the FPH policy and the situation that would/will apply with implementation of the FPH policy)”<sup>3</sup>*

## High level of uncertainty

The Model Build Report identifies a number of high significance uncertainties that affect the accuracy of floodplain harvesting outputs in a long-term model assessment. These include:

1. The accuracy of measurement of river diversions  
Meters used to measure regulated and supplementary diversions have known uncertainties of  $\pm 1-25\%$ . There needs to be further meter testing and validation data through the Metering Framework
2. Sparsity of records on harvested volumes  
The lack of reliable records on actual volumes harvested from overbank flow events or rainfall–runoff makes it difficult to validate both the valley total and individual variability in floodplain harvesting.
3. Rainfall–runoff parameters for within farm runoff model  
It is not possible to verify and account for individual variation in irrigation practice and runoff generation due to limited data to characterise differences in runoff between undeveloped, developed and irrigated areas.
4. Relationships between river flow and overbank flow and access to that flow  
In small to medium floods the actual volume harvested will be sensitive to the breakout relationship and access to this flow. More information is needed to understand this. <sup>4</sup>

Other concerns with the validity of the model is the +51% error rate/bias above Narromine and - 8% bias between Warren to Marebone <sup>5</sup> for total diversions and the gauge data.

*“The calibration results show acceptability for all statistical criteria **though the mass difference plots for some gauges show some large divergences between observed and modelled flows.**”<sup>6</sup>*

## Landscape losses, return flows

IRN consider that it is completely unacceptable that the models used do not have the capacity to determine return flows. Only one side of the ‘ledger’ is being looked at. This

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<sup>3</sup> Alluvium letter

<sup>4</sup> Model Build Report Table 3.7

<sup>5</sup> Ibid Table 33

<sup>6</sup> Alluvium letter



significant deficit alone IRN considers enough for the process of issuing FPH licences to be suspended until such time as there is a quantum improvement in the models.

Experienced modellers maintain that it would not be difficult to incorporate return flows and other functions into the hydrological models to better estimate the contribution of floodplain flows to the river system either through surface or groundwater.

The other key issue with the model is the lack of information about the losses in the landscape between the farm and river gauge. Analysis of on farm capacity and flow records of downstream gauges is the key tool to estimate volumes of FPH take.

The accuracy of river gauges is another key concern in this process.

There is a good chance that unknown landscape losses and return flows are being attributed to FPH take and will therefore be included in FPH licences.

**Climate change** has not been factored into any modelling scenarios throughout the determination of FPH accounting rules, despite the new robust climate/hydrologic datasets developed by DPIE last year for inclusion in the Regional Water Strategies (RWS). With these new datasets, DPIE has been able to come up with a 'base case' river system model.

From the Macquarie Castlereagh RWS, the Valley can expect *“reduced frequency of floods, but when they do occur, significantly higher flood flows throughout the entire region, particularly during the summer-autumn period.”*

While IRN acknowledges that the climate scenarios in the RWS are potential scenarios, we are of the opinion that climate change impacts are already being felt, and that global climate science indicates that we are heading for the 'conservative' or driest result indicated in the RWS.

The RWS states:

*“just relying on our historical data to make water management decisions no longer represents the best course of action and that we have an opportunity to put plans in place to make sure we are prepared and resilient if there are future changes in the climate.”*

IRN considers that by omitting climate change scenarios in FPH modelling and using flood behaviour up to 2009 to propose account management rules, the NSW Government are acting strongly in a way that benefits the irrigation sector, and heavily jeopardising the ecological, cultural and socio-economic future of far Western NSW.

Floodplain harvesting licences should not be issued until climate change predictions are incorporated into the modelling used.

## Plan Limit and Cap

Total extraction in the Macquarie Valley is considered to be under the sustainable diversion limit (SDL) even after the inclusion of FPH volumes to be licenced.

The *'Assessment of environmental water requirements for the proposed Basin Plan: Macquarie Marshes'* was done in 2009 to determine the SDL for the Valley. At that time, the condition of the vegetation in the Marshes was very poor, still recovering from the millennium drought. The condition of the Marshes was so poor that in 2009 the Commonwealth Government lodged a notification to the Ramsar Secretariat of a change in the ecological character of the Macquarie Marshes Ramsar site, under Article 3.2 of the convention.

Due to the assessment of environmental water requirements being done when the condition of the Marsh vegetation was extremely poor, the SDL is not adequate to support a healthy or recovering Marsh.

The Macquarie is an over-allocated system, leading to a low general security reliability. When Burrendong dam was completed in 1966/67 the yield of the Macquarie River was assessed as 406,000 ML. Too many licences have been issued, and now the total allocation of regulated and supplementary flow water for the system is around 899,000 ML.<sup>7</sup>

Simply put, the entitlements in the Macquarie Cudgegong Valley exceed the capacity of the Valley. The answer to this situation under the priorities of the WMA, the Water Act 2007 and the Basin Plan is to adjust entitlement to ensure ecological, native title and basic landholder rights are secure.

The reality is that entitlement is prioritised in water management decisions in the Macquarie Valley.

The information provided in the various reports regarding new plan limit and Cap scenarios is deliberately obtuse and often contradictory. The 2018 FPH Policy states that *'Floodplain harvesting extractions will be managed within existing long-term average annual extraction limits.'*<sup>8</sup>

The long-term average annual extraction limits (LTAAEL) are based on 2001/2002 level of take in the Macquarie Cudgegong regulated water sharing plan. This is referred to as the Plan Limit in documents provided with the Macquarie FPH public exhibition, although there appears to be no reference to the level of take at 2001/2002.

The demonstrably poor modelling process has been used to update the Plan Limit and the Cap. There also appears to be no reference to the 93/94 level of take in the Macquarie under Cap.

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<sup>7</sup> Johnson W J (2005) Adaptive management of a complex social-ecological system: the regulated Macquarie River in south-eastern Australia. Master of Resource Science Thesis, University of New England.

<sup>8</sup> DPIE-Water, September 2018. NSW Floodplain Harvesting Policy p 1

The information provides no evidence to substantiate the numbers described for a new Plan Limit or Cap for the Macquarie Cudgegong. No access has been provided to the previous accredited Cap models to understand how the updated model has informed the process.

IRN considers that the process lacks transparency and validity. We do not support that the proposed volumes of FPH can be licenced until improved data is obtained.

The explanation around Plan Limit and Cap modelling appears to be a justification for locking in a high volume of unsustainable flood water extraction and favouring the industry rather than improving ecological sustainability of water use and extraction in the Macquarie Valley.

### **Tailwater/Rainfall runoff Exemption**

IRN strongly objects to the changes to the FPH policy that allows for the exempt capture of rainfall runoff when no water is being harvested from outside the farm. This is free, unaccounted for water that is not available to any landholder or farming business in NSW other than those with access to FPH.

We note the change in language for the Macquarie FPH consultation from rainfall runoff to tailwater return. However, the draft exemption regulation specifically relates to rainfall.

All captured rainfall runoff should be managed under the 10% harvestable rights rule. Any capture above that right must be licenced to ensure equity across the state.

Runoff from the application of water to irrigated fields demonstrates inefficient use of water. This should not be an argument for a rainfall runoff exemption.

At the Narromine FPH public consultation on the 1<sup>st</sup> April 2021, Dan Connor indicated that harvestable rights are not applicable to the tailwater/rainfall runoff exemption. Mr Connor claimed that harvestable rights occur when landholders dam first and second order streams, and that the tailwater/rainfall runoff exemption was a different practice.

While harvestable rights are often collected by the damming of first and second order streams, there is no clarification that IRN can find that water collected under harvestable rights is restricted to water collected from damming first and second order streams.

The limited data available to model rainfall runoff and characterise differences between undeveloped, developed and irrigated areas is a key identified problem with the modelling process.

In the Macquarie Cudgegong there is 10,254 ML of water being considered for tailwater/rainfall runoff exemption. If this significant volume of water is not brought into the FPH licencing framework, it won't be counted towards the SDL. This form of take would not need to be measured, just 'monitored' for assessment under the risk assessment in the Water Resource Plan.

IRN maintains that all water above the 10% harvestable right that is captured for commercial benefit must be licenced.

## **Environmental Outcomes**

The significance of flood flows to the maintenance and improvement of the health of the Ramsar listed Macquarie Marshes has not been adequately assessed in the methodology adopted to calculate volumes for FPH licences in the Macquarie Valley.

The Environmental Outcomes report states *“Given the environmental significance of this nationally and internationally recognised wetland, improvements in all five breakout zones which incorporate the Marshes would be desirable.”*

Not desirable enough, it would seem, to consider NSW’s legal obligations under the Ramsar Convention, Migratory Bird Agreements, the WMA 2000, Water Act 2007 and the Murray Darling Basin Plan and return some critical flood water to the struggling Marshes.

The volume of FPH in the Macquarie Cudgegong regulated water sharing plan 2009 was estimated to be 0 GL. The new modelling (with many limitations) has determined FPH take to be 62.791 GL (inc rainfall runoff) under current conditions.

This new information demonstrates that 62.791 GL that was previously accounted for as planned environmental water is now proposed to be added to the level of water extraction.

There is proposed to be no water returned to the environment through this regulatory process, and therefore no improvement in environmental conditions.

The process does not recognise the environmental impacts of over 30 years of unregulated FPH take and makes no effort to mitigate these impacts.

Floodplain flows have significant ecological value that has not been fully recognised or assessed in this process. The volume of extraction of ecologically important overland flows is highly significant and will not be adequately regulated under the current proposal.

## **Carryover**

IRN objects to the use of the term carryover in the management of FPH water accounts. Volumes of water that are not available cannot be carried over. This is a misrepresentation of the term. The concept of carry over comes from actual water in licenced accounts that hasn’t been used in the year it was allocated.

The FPH policy is promising water from the river system that has not yet arrived. It is proposing to commit access to an increasing share of future flood flows by up to 500% of unit shares thus putting the river and the environment in debt to the irrigation industry.

This approach is entirely unacceptable and weighted towards the irrigation industry at the expense of downstream water users, groundwater recharge, cultural values and important ecological values and functions of the river system.

## **Consultation**

IRN believes that the recent findings of the Independent Commission against Corruption (ICAC) into management of water in NSW mirrors the deficiencies in consultation throughout the development and implementation of FPH policy.

The ICAC recommendations concern the undue focus on irrigators' interests within water agencies and deal with the identified failures of the department.

These include a lack of transparency, balance and fairness in consultation processes undertaken by water agencies in relation to external stakeholders, and a practice of sidelining public officials undertaking environmental roles within the NSW government.

DPIE-Water staff and modellers have had regular meetings with the irrigation industry while implementing the FPH policy. There has only been one environmental stakeholder briefing during the exhibition period for the Macquarie Valley FPH process and one environmental group consultation with the independent model expert to discuss failings in the modelling process.

## **Conclusion**

IRN strongly objects to the proposed very generous volume of FPH to be granted as windfall compensable, private property rights and to the proposed rules for accessing flood waters for extraction. The information provided demonstrates that the model used as the basis for these decisions is not fit for purpose.

The claim that total extractions in the Macquarie Valley are under the SDL are not supported by accredited cap reports, documentation is deliberately obtuse and often contradictory.

It stands to reason when put in context of the findings of the recent ICAC investigation into management of water in NSW, that "...a misguided effort to redress a perceived imbalance caused by the Basin Plan's prioritisation of the environment's needs" has resulted in a bias within the Department towards irrigation, that the Department has more work to do to consider the needs of the environment as a stakeholder in the licencing of FPH.

The outcome of the proposed licenced volume of FPH in the Macquarie Valley will ensure the continued decline of in-valley river health, the Ramsar listed Macquarie Marshes and of the Barwon-Darling and downstream connected water sources.

Yours sincerely

Brian Stevens

Secretary  
Inland Rivers Network