Coastal Harvestable Rights Review

Discussion paper

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Cover image: James Horan, Destination NSW

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Executive summary

In 1998, the NSW Government announced principles for development of a Farm Dams Policy. They guided discussions on replacing the pre-1999 framework, which only allowed farmers to construct unlicensed dams of a specific size.

The Farm Dams Policy allowed landholders to capture an interim 10% of runoff from their property. It enabled larger dams without the appropriate licences to be kept, provided the water was used for limited purposes.

Harvestable rights allow rural landholders in coastal regions to collect 10% of the average annual regional rainfall run-off from their property and store it in farm dams up to a certain size. They can do this without needing a water access licence, water supply work approval or water use approval. This review considers the effects of increasing the proportion of rainfall run-off that landholders can capture as a harvestable right, allowing dams to be built on larger tributaries, or doing both of these within NSW catchments that drain to the coast.

The review aims to determine whether greater access to water for agricultural ventures could be allowed, while ensuring enough water is available for downstream water users and the environment. To help answer this question, the NSW Department of Planning, Industry and Environment commissioned hydrological modelling of changes in 10 case study areas. The modelling assessed the likely impacts of different harvestable rights limits on downstream river flows and water availability for downstream users and the environment. This review also considers the possible effects on water trading, water pricing and charges, and identified the main industries that might be affected by increased harvestable rights.

Some water users have previously proposed that higher limits should apply to their harvestable right to reflect the higher rainfall that coastal areas receive. They contend that agricultural production is constrained by increasing competition for water, limitations on accessing water through trade and existing harvestable rights limits, which they believe could be increased while maintaining a sustainable level of access for downstream users.

The studies completed for this review show that uniformly increasing the harvestable rights limits is likely to have very different effects in different catchments. Some areas would see small effects, while there would be larger effects in others. Increased harvestable rights would help some individuals and industries but may adversely affect other water users who rely on water entitlements or industries that depend on flow events for good water quality and ecosystem function.

Other key considerations relate to an equitable distribution of costs and benefits, a potential change in policy intent and how to best assess and manage the likely risks to specific environments from changed flow regimes. The section on ‘Benefits, impacts and issues’ and the appendices provide more details on study findings and issues.

While the impacts of climate change are being more thoroughly reviewed through the modelling and analysis informing development of regional water strategies, the Bureau of Meteorology advises that coastal catchments in New South Wales can expect to have less winter rainfall and more intense extreme rainfall events. Agricultural industries in particular may need to change how they access water to adapt to changing conditions.

This paper also outlines other ways access to water could be increased for some users in some coastal draining catchments and summarises the advantages and disadvantages of each.

Purpose

The department is working towards recommendations on future limits for coastal harvestable rights. We would like your feedback on the potential effects and implications of the different harvestable rights limits investigated, and on other options that could improve water access.

We encourage all affected stakeholders to engage and provide feedback during the consultation process to ensure we understand the different needs and views and can achieve a balanced policy outcome. Specific questions on which we would like feedback are available on the Department's website at dpie.nsw.gov.au/coastal-harvestable-rights-review.

Introduction

Water is one of the most important natural assets in New South Wales (NSW). The community, businesses and the environment all rely on water to survive and prosper.

In 2015, the NSW Government committed to review the limits on harvestable rights in coastal-draining catchments to assess whether the current limits maximise productive use of water while ensuring that sufficient water is available for downstream water users and the environment. In conducting the review, the department is assessing the effects of increasing the limits on:

- availability of water for downstream users
- the water trading market
- availability of water for the environment.

Background

Key points

Harvestable rights:

→ allow landholders to collect a proportion of rainfall run-off from their properties in farm dams without a water licence or approval

→ arose from the NSW Farm Dams Policy, which aimed to provide water for stock watering, domestic use and general farming purposes with minimal regulation

→ are implemented using a maximum harvestable right dam capacity (MHRDC) for a property

→ have volumetric and location-based limits

→ can be used for any purpose

→ cannot be supplied to another property or traded

→ are part of a larger water-management framework.

Harvestable rights

What are harvestable rights?

The *Water Management Act 2000* (WM Act) provides for harvestable rights as one of three basic landholder rights. In most rural areas, harvestable rights allow landholders to collect 10% of the average annual regional rainfall run-off from their property and store it in farm dams up to a certain size, without a water access licence, water supply work approval or water use approval.

The ability to construct a dam to capture harvestable rights was introduced under the NSW Farm Dams Policy in 1999, which changed the rules for unlicensed farm dams. The previous rules did not take property size or rainfall in account. They permitted an unlimited number of farm dams on a property, provided the dam capacity was less than seven megalitres and use was restricted to domestic and stock purposes. Under the Farm Dams Policy, the permitted size of a harvestable rights dam is based on the size of the property and the regional average rainfall run-off. The water from these dams can be used for any purpose.

The Farm Dams Policy was replaced by harvestable rights, which were legally established when the WM Act came into effect.

What are the harvestable rights limits?

Harvestable rights orders made under the WM Act set conditions for water that is captured and stored as a harvestable right. Current limits for coastal draining catchments are set by the Harvestable Rights Order—Eastern and Central Division (the Order). They are:

- volumetric: 10% of the average annual regional rainfall run-off from a property
- location-based: dams can be built only on non-permanent, mapped, first- and second-order streams, or on unmapped streams[1].

Legislative and policy context

Harvestable rights sit within a broader framework of legislation and policies, including:

- the WM Act
- harvestable rights orders
- the Farm Dams Policy
- water sharing plans
- the National Water Initiative.

Appendix 1 in *Coastal Harvestable Rights Review—Appendices* discusses the influence of these on harvestable rights. It also provides an overview of farm dams rules in other states.

What is a maximum harvestable right dam capacity?

A maximum harvestable right dam capacity (MHRDC) is the total storage volume of harvestable rights dams allowed on a property.

You calculate this volume using an online calculator[2] that multiplies your property size with a location-specific value based on long-term average rainfall data from the Bureau of Meteorology, called MHRDC multiplier values. The values also consider regional run-off conditions and volumes, evaporation rates and periods between replenishment (rainfall patterns).

This method of calculation means that larger dams are permitted for properties in high rainfall areas, such as on the coast (see Table 1).

Table 1. Examples of MHRDC calculation

High rainfall area		**Low rainfall area**	
Location	= Mullumbimby	Location	= Moree
Property size	= 100 hectares	Property size	= 100 hectares
Multiplier value	= 0.19	Multiplier value	= 0.06
MHRDC	= 100 x 0.19 = **19 ML**	MHRDC	= 100 x 0.06 = **6 ML**

Figure 1 shows a relative comparison of harvestable right volumes and MHRDC for the same-sized property in high- and low-rainfall areas. It shows dams in high-rainfall areas are generally smaller than their harvestable right volume, as they refill more often throughout the year. Dams in low-rainfall areas may be larger than their harvestable right volume, due to longer periods between refilling and higher evaporation rates.

[1] Harvestable Rights Order—Eastern and Central Division, *NSW Government Gazette*, No. 40, 31 March 2006, page 1628.

[2] Available at www.waternsw.com.au/customer-service/water-licensing/blr/harvestable-rights-dams/maximum-harvestable-right-calculator

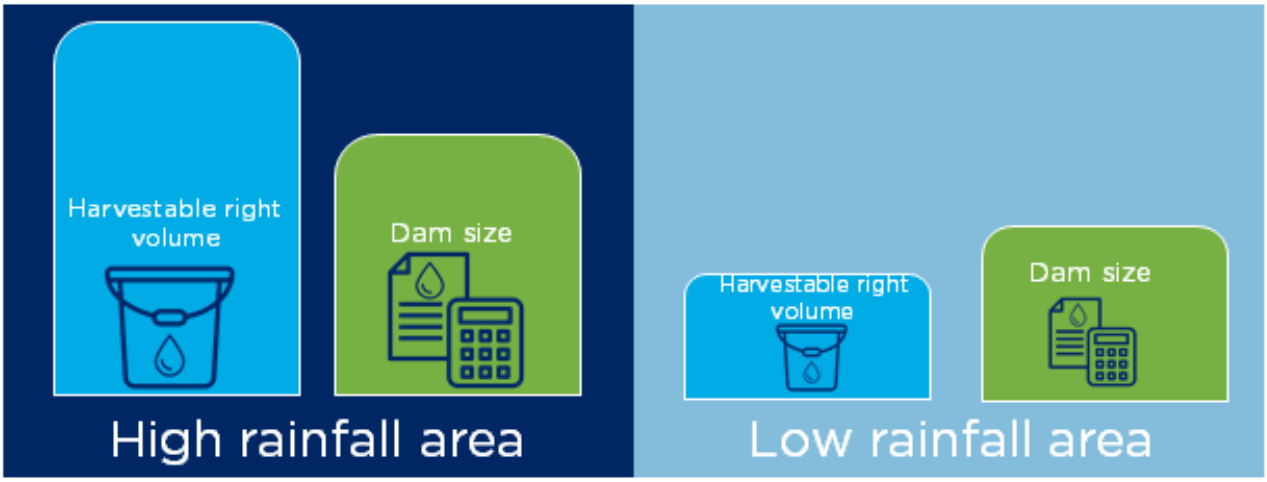


Figure 1. Relative comparison of harvestable right volume and MHRDC in high- and low-rainfall areas

Exemptions

Some dams are exempt from the volume limits for harvestable rights dams. These include dams:

- to control or prevent soil erosion
- for flood detention and mitigation
- to capture, contain and recirculate drainage and/or effluent to prevent contamination of a water source
- that are 'turkey nest' dams and ring tanks—storages without a natural catchment
- approved by the department (in writing) for specific environmental purposes.

Want to know more? See the background information in *Coastal Harvestable Rights Review—Appendices*, Appendix 1.

Coastal Harvestable Rights Review

Some stakeholders have proposed that higher limits should apply to their harvestable rights to reflect the higher rainfall that coastal areas receive. They contend that agricultural production is limited by:

- increasing competition for water
- limitations on accessing water through trade or other means
- the existing harvestable rights limits.

They believe the existing harvestable rights limits could be increased while maintaining a sustainable level of access for downstream users. In response, the department is reviewing the harvestable rights limits that apply in coastal draining catchments, which are set out in the Order.

Review method

Figure 2 shows the review process.

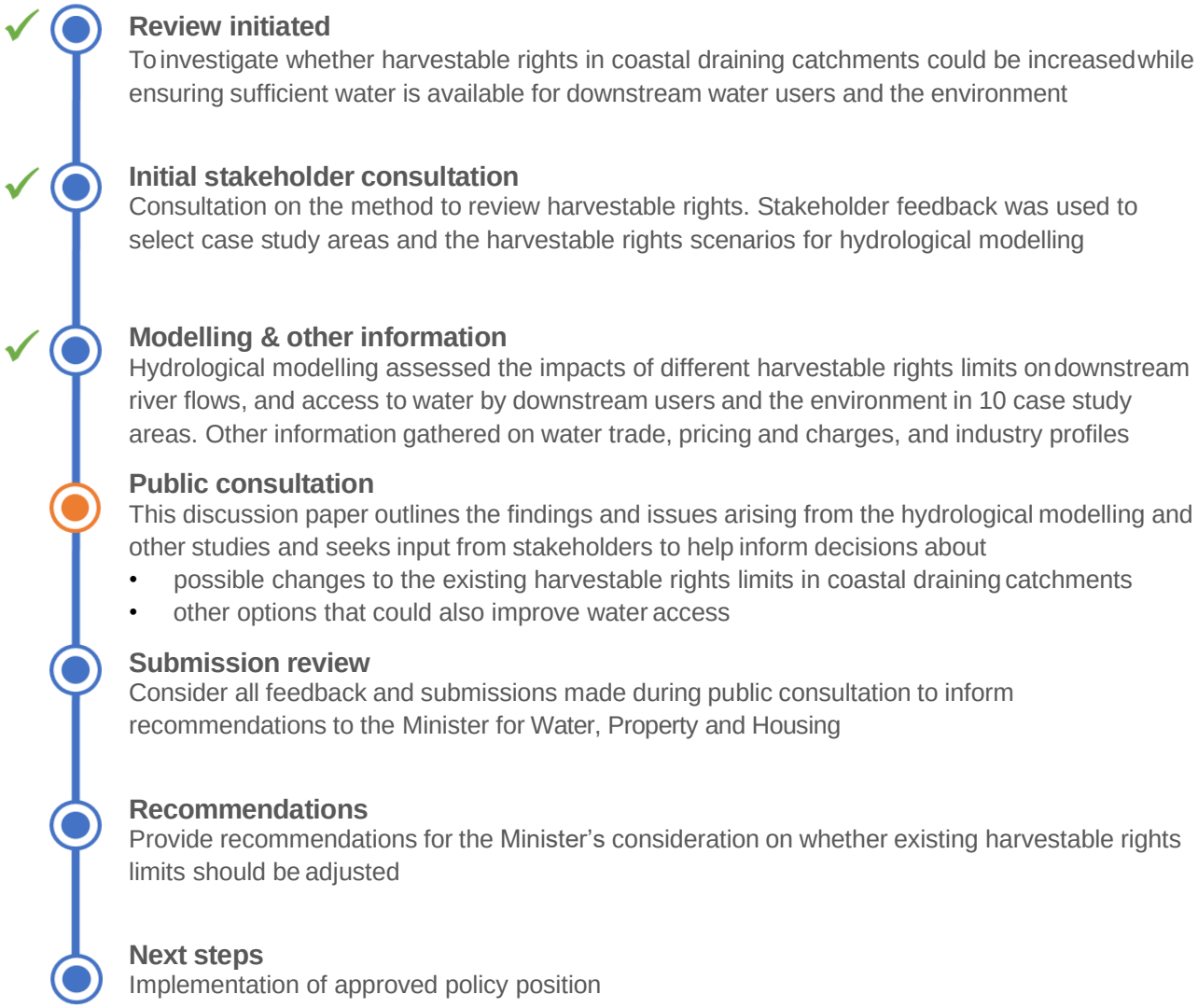


Figure 2. Review stages and progress

Appendix 2 in *Coastal Harvestable Rights Review—Appendices* provides feedback from the initial stakeholder consultation phase.

Modelling

Using the following criteria, the department selected 10 coastal catchments with high competition for water for modelling:

- a minimum of two target areas per unregulated Independent Pricing and Regulatory Tribunal (IPART) NSW pricing valley (North Coast, Hunter and South Coast)
- areas of high farm dam density and rapid industry expansion
- streams identified as stressed, determined as ratio of entitlement to low flows
- areas where streamflow data exists
- areas suggested by stakeholders during initial consultation.

An independent company, Hydrology and Risk Consulting (HARC), then hydrologically modelled these catchments to assess risks to water users' reliability and access as well as to availability of water for the environment. The modelled scenarios included different combinations of:

- **increasing the harvestable rights percentage**—increasing the permissible harvestable rights run-off percentage from 10% to 20%, 30% or 50%
- **permitting harvestable rights dams on third-order streams**—as well as on non-permanent, mapped first- and second-order streams, and unmapped streams
- **varying levels of landholder uptake**—using the current level of uptake of harvestable rights in each catchment, and 25%, 50%, 75% and 100%.

The HARC report, *Review of Harvestable Rights for Coastal Catchments, Modelling Component* is available on the Department's website at dpie.nsw.gov.au/coastal-harvestable-rights-review.

Figure 3 shows the selected case study areas.

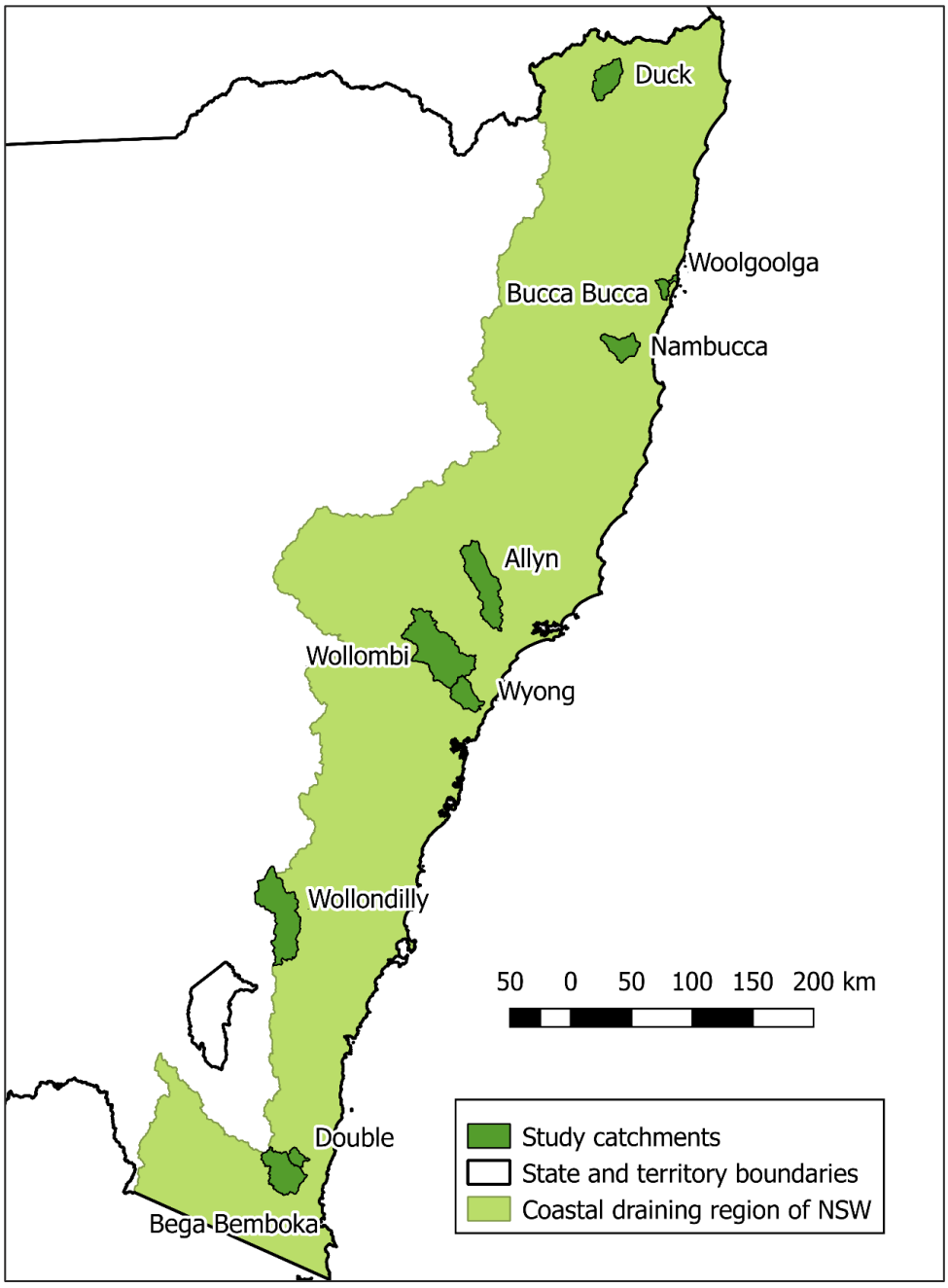


Figure 3. Case study areas

Other studies and considerations

The department also investigated potential impacts on:

- water trade—using the 10 modelled case study catchments (see *Coastal Harvestable Rights Review—Appendices*, Appendix 4)
- water pricing and charges—exploring whether increased harvestable rights would lead to fewer licence holders and potential cost-recovery implications (see *Coastal Harvestable Rights Review—Appendices*, Appendix 5)
- water availability for the environment—identifying which river flows might be altered and their known general importance for ecological processes (see *Coastal Harvestable Rights Review—Appendices*, appendices 3 and 6)
- socio-economic considerations—primarily using a water use profile to identify which industries may be affected by an increase in harvestable rights (see *Coastal Harvestable Rights Review—Appendices*, Appendix 8).

The review needs to consider the objectives and principles of the WM Act, other relevant NSW legislation and obligations under intergovernmental agreements.

Harvestable rights represent one tool within a broader water-management framework that could provide complementary or more effective options for improving water access in coastal draining catchments.

Snapshot—coastal draining catchments

The people and environments of coastal NSW rely on streams and rivers to provide good-quality water in sufficient quantities for a range of uses. These include drinking water for town water supplies, domestic and stock purposes, agricultural production, industry, healthy and productive fisheries, and ecological processes and services that support healthy functioning ecosystems.

The volumes and movement of water in coastal draining catchments are very different from inland catchments. Average annual rainfall is typically much higher, with many areas receiving average rainfall of more than 1,000 mm and some in the 1,500- to 2,000-mm range (Figure 4). At the same time, rivers and streams on the coast are usually steeper and shorter, resulting in 'flashier' flows than those in inland rivers. Coastal climates are largely shifting towards decreased winter rainfall and more intense extreme rainfall events (CSIRO and Bureau of Meteorology, 2020).

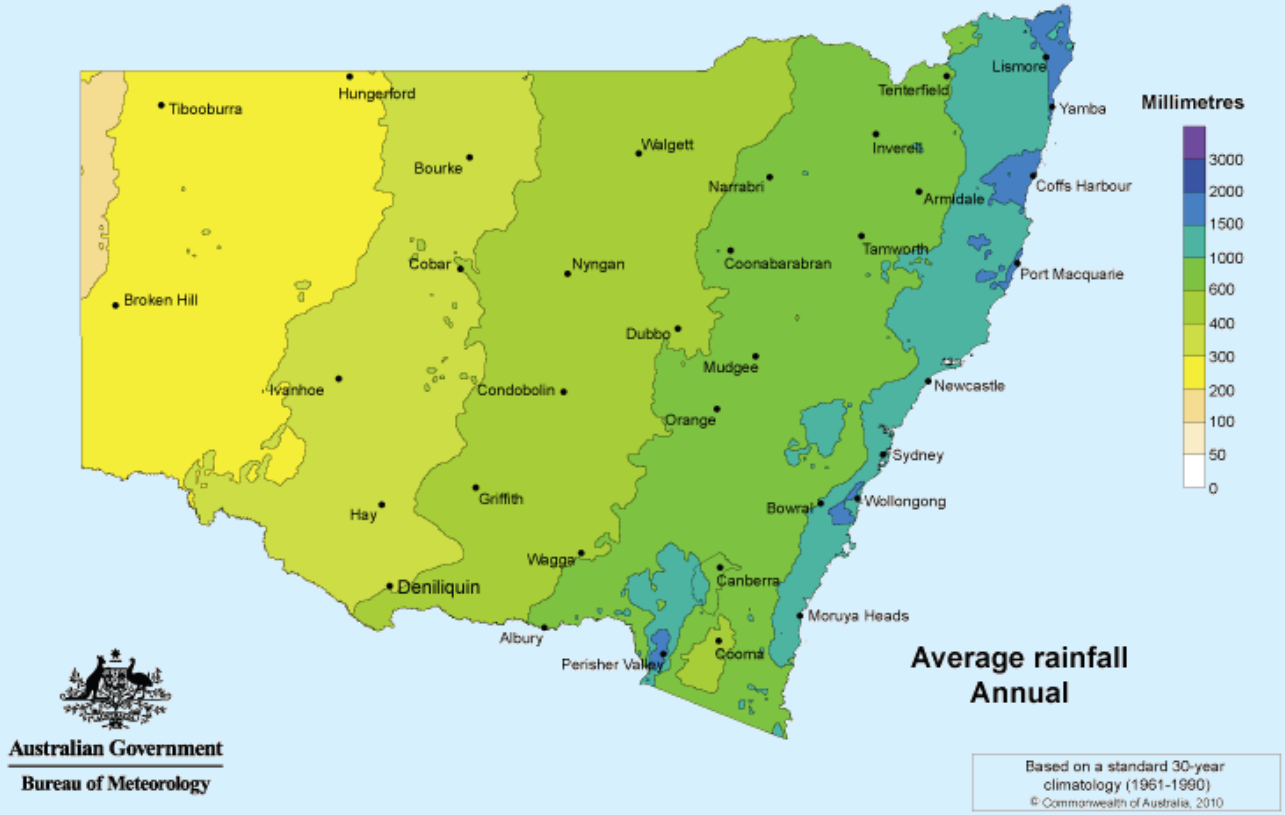


Figure 4. Mean annual rainfall for NSW

Most coastal streams and rivers are unregulated—they do not have major storages or dams to control the release of flows. Licensed water users are typically 'run-of-river' users and may pump only when flows are above the cease-to-pump flow level set in the relevant water sharing plan.

Coastal water users are also more likely to have relatively small entitlements compared with inland users. Like their inland counterparts, they may also have licensed farm dams to collect rainfall run-off in addition to their harvestable right.

Coastal catchments recently experiencing water access issues are generally those:

- where industry is changing, leading to greater demands for water
- where industry relies on run-of-river water access (with no off-river storage), and dry conditions lead to low flows and cease-to-pump conditions being imposed
- that have low levels of water entitlement and restrictions on trade, often due to the presence of high conservation values.

Most coastal unregulated water sharing plans do not include harvestable rights in their long-term average annual extraction limits (LTAAELs). Implications for LTAAEL rules would need to be considered if harvestable rights limits were increased.

Coastal draining catchments are not subject to sustainable diversion limits set by the Murray—Darling Basin Plan.

Benefits, impacts and issues

This section presents potential benefits, impacts and issues arising from the investigations into the likely effects of changing harvestable rights rules in coastal draining catchments. Appendices 3 through 8 in *Coastal Harvestable Rights Review—Appendices* provide more detail on the modelling and other studies. Benefits, impacts and issues are grouped as outlined in Table 2.

Table 2. Changing harvestable rights rules—benefits, impacts and issues

Theme	Issue
Flow-related outcomes	• General findings • Potential impacts on case study areas
Industry productivity	• Agriculture and irrigation • Fishing and tourism • Mining • Urban industry
Licensing framework	• Changes in access • Long-term extraction limits • Trade • Pricing and charges • Advertising, assessment and impact mitigation
Environment	• Flow regimes • Water quality
Town water	• Secure yield
Dams on third-order streams	• Legislative controls • Dam safety • Base flows and barriers
Socio-economic	• Potential transfer of benefits
Aboriginal cultural values and uses	• Values and uses • Native title
Other issues	• Urbanisation and subdivision • Artificial refuges • Firefighting • Administration and compliance • Equity

Flow-related outcomes

Increasing harvestable rights across coastal NSW is likely to see small changes to flows and flow-related outcomes in some catchments. However, in other catchments, the modelling suggests

larger effects (see the range of modelled changes to key flows across all case study catchments in *Coastal Harvestable Rights Review—Appendices*, Appendix 3 ('Summary of results' section). This means that a uniform change to harvestable rights across coastal NSW would have more effects in some catchments than in others. The different modelled outcomes were influenced by catchment characteristics, existing flow patterns, the proposed harvestable rights percentage, level of uptake, and if harvestable rights dams were permitted on third-order streams.

Case study—Bucca Bucca and Wollondilly catchments

Effects of increased harvestable rights on mean annual flow volumes

Key points

→ An analysis of the rainfall and flow records for the 10 case study catchments indicates large variations between catchments in:
- rainfall—638 mm/year to 1,588 mm/year
- run-off depth—35 mm/year to 645 mm/year
- run-off as a percentage of rainfall—5% (Wollondilly) to 41% (Bucca Bucca).

→ Modelling showed the average volume of water flowing out of the case study catchments per year would be least affected in Bucca Bucca (which generates the most run-off compared with its rainfall) and most affected in Wollondilly (which generates the least amount of run-off compared with its rainfall).

→ As an example, full uptake of a 30% harvestable right with dams on first- and second-order streams would reduce the modelled mean annual flows with no harvestable rights dams by only 2.4% in Bucca Bucca but by 32.5% in Wollondilly.

Want to know more? See *Coastal Harvestable Rights Review—Appendices*, Appendix 3 (sections on 'Catchment hydrology' and 'Effects on mean annual flow'.

In general, the modelling showed that:

- as the harvestable rights percentage and uptake of this right increase, the number and duration of freshes decrease
- in drier catchments, it is likely that increasing the harvestable rights percentage would reduce inflows into other farm dams and downstream flows
- dams on third-order streams would reduce low flows and increase the frequency and duration of cease-to-pump days, which would affect the environment and may affect other water users
- the effects of either a higher harvestable rights percentage or allowing dams on third-order streams would be greater in dry years than in average years.

HARC (2020) presents the modelling results as *average* changes in the hydrology of different parts of the flow regime, which helps to compare complex changes across individual catchments. As averages do not show the full variation of changes that could occur, a series of fact sheets[3] presents the modelling results in more detail and explains the changes likely to occur for key flow types. Looking at freshes, for example, excluding the infrequent, very high flows from the analysis provides a picture of the likely effect on freshes that is not evident when focusing on averages. This is because the infrequent, very high (i.e. flood) flows 'skew' the average change in flows and mask effects on smaller freshes. We suggest reading the fact sheets in conjunction with this discussion paper, the appendices and the modelling report so that you have a more detailed level of information to consider when providing us with comments on your own context.

Want to know more? See *Coastal Harvestable Rights Review—Appendices*, Appendix 3 ('Discussion of results' section) and Appendix 7.

[3] Available at dpie.nsw.gov.au/coastal-harvestable-rights-review

Industry productivity

Agriculture and irrigation

A larger harvestable right could benefit individual enterprises that would like to access more water than they can through existing means. The increased right could be through an increase in the maximum dam size allowed or the option to build dams on third-order streams. Agricultural enterprises would be allowed to take more water with a higher harvestable right percentage or, if they had a suitable dam site, could get a more reliable supply of water from dams on third-order streams. This would increase reliability for these users as those dams would be more likely to intercept base flows of rivers instead of only intercepting intermittent stream flows.

Industries that need a year-round supply of water could also benefit from more access to water. This would enable them to move into coastal locations where intermittent access to water does not currently support these industries. Provided this does not impact on downstream industries, this could result in more diverse, resilient local economies in some locations.

At a larger scale, increasing the volume of water intercepted under harvestable rights would reduce the volume of water reaching rivers. This would reduce water access and availability for downstream users in dry years by prolonging cease-to-pump periods. Increasing harvestable rights could also reduce inflows to licensed farm dams and decrease the reliability of these storages. It might result in a transfer of benefits from downstream users to upstream users.

Case study—Bemboka and Nambucca catchments

Effects on downstream licensed water users if harvestable right dams were allowed on third-order streams

Key points

- → Allowing dams on third-order streams would increase the number of cease-to-pump days in drier years.
- → Modelling in the Bemboka catchment showed a 2.9% increase in cease-to-pump days from harvestable rights dams on third-order streams—equivalent to an increase from 45 to 55 cease-to-pump days on average in dry years.
- → Modelling in the Nambucca catchment showed negligible impact on the number of cease-to-pump days when additional dam capacity was restricted to first- and second-order streams.

Want to know more? See *Coastal Harvestable Rights Review—Appendices*, Appendix 3 ('Effects on low flows' section).

Commercial, recreational and Aboriginal fisheries and tourism

Healthy freshwater, estuarine and marine ecosystems support productive fisheries as well as the large tourism industry on the coast. Changed freshwater hydrological regimes are key threats to estuarine environments in coastal NSW. The effects of reduced flows on estuarine and coastal fisheries' production have been raised as a concern by the commercial fishing industry.

Changing harvestable rights limits could affect aquatic health and restrict the movement of aquatic species. This may in some way affect the productivity of the seafood industry, as well as recreational and Aboriginal fishing opportunities. A reduction in the frequency or intensity of freshes could also have negative effects on water quality and the growth and reproduction of aquatic species. This may, in turn, affect estuarine and coastal fisheries and regional tourism, particularly estuarine and inshore prawn fisheries, which rely on seasonal freshes for spawning[4].

[4] See www.nespnorthern.edu.au/wp-content/uploads/2016/02/Project-5.4-FRDC-flows-final-report-Jan2011-Burford1.pdf for example.

Mining

Some mining operations need considerable volumes of water, which can be obtained through various means including licensed entitlement, onsite recycled water and collection of water from run-off.

As well as taking water under harvestable rights, mine operations can collect 100% of rainfall into their pits and storage dams under a regulatory exemption designed to prevent contaminated water from entering waterways. Exemptions in the Order for certain dams, particularly those relating to contaminated water, add to the ability of mines to capture large proportions of run-off.

While an increase in harvestable rights would benefit mining, it could exacerbate issues associated with proportionally high levels of extraction of run-off in areas with numerous mines.

Urban-based industry

Industries connected to town water supplies also rely on secure water sources. Urban-based, water-dependent industries may in some cases experience reduced levels of service if harvestable rights increase. This review further discusses town water supply on page 17.

Licensing framework issues

Changes in access

Increasing harvestable rights would generally benefit landholders who can build or modify harvestable rights dams, with additional water access and associated economic benefits. However, some licence holders and downstream water users could experience a decrease in access.

This is due to a reduced frequency of flow events in some catchments when downstream users could access water, and longer duration of times when pumping is prohibited. This is more prevalent in dry years, when farm dams capturing rainfall run-off intercept a greater proportion of flow. It would have little to no effect on downstream access in wet years, when rivers remain above the cease-to-pump levels.

Long-term average annual extraction limits

Increasing harvestable rights would allow a greater volume of water to be taken and used outside the licensing framework, as collection of this water does not require a licence or work approval.

In most coastal water sharing plans, long-term average annual extraction limits (LTAAELs) consist of licensed entitlement volumes and annual water requirements for domestic and stock rights and native title rights. Only some coastal water sharing plans include harvestable rights requirements in their LTAAELs; these include the water sharing plans for

- Bega and Brogo Rivers Area Regulated, Unregulated and Alluvial Water Sources
- Hunter Unregulated and Alluvial Water Sources (in the Greater Hunter Extraction Management Unit only)
- Murrah-Wallaga Area Unregulated and Alluvial Water Sources
- Towamba River Unregulated and Alluvial Water Sources
- Tweed River Area Unregulated and Alluvial Water Sources.

Implications associated with potential changes to LTAAEL rules would need to be considered if harvestable rights limits were increased. For example, questions that arise include:

- Should such a significant quantity of water take remain outside the LTAAEL?
- If harvestable rights water take were included in LTAAEL accounting, what impact would this have on other water users and the environment?

Trade

Little trade occurs in the specific case study areas and along the coast generally. This is due to:

- a difference in the supply of licensed entitlement people are willing to trade and the demand for additional licensed entitlement, resulting in high market prices
- restrictions on dealings (trade) in water sharing plans, sometimes due to the Access Licence Dealing Principles
- trade processing times
- the capacity of unregulated water users to access and/or store traded water under current conditions on the taking of water
- high prices to apply to trade relative to the price of water
- metering requirements for water trades
- lack of awareness about options to trade.

It is unclear how the trading behaviour of licensees would respond if there were changes to harvestable rights, but it is likely to vary based on individual circumstances. Appendix 4 in *Coastal Harvestable Rights Review—Appendices* provides more information on the analysis of how increasing harvestable rights limits could affect the trading market.

Pricing and charges

Water pricing is based on cost-recovery principles. The analysis in Appendix 5 in *Coastal Harvestable Rights Review—Appendices* shows that if changes to harvestable rights affect the number of licensees or the volume of entitlement that attracts charges, this could have flow-on effects on water pricing and charges. If significant entitlement was handed back and withdrawn from the market due to increasing harvestable rights, the fixed costs for water supply would need to be recovered from fewer remaining users. Equally, if entitlement was returned to the government it would create opportunities for the government to redistribute it to other users, for example through controlled allocations.

Increased administrative requirements (for example, assessment of whether licensed dams still require a licence) would likely also add to the cost of providing water-management services and potentially result in higher pricing and charges for licensed water users.

Advertising requirements, assessment and impact mitigation mechanisms

Dams whose volume exceeds the MHRDC require a water supply work approval, which must be advertised to give third parties an opportunity to object. WaterNSW reports that water supply work applications typically receive a high number of objections in coastal areas, particularly on the north coast. Applications must also be assessed and receive agreement from the Department of Primary Industries—Fisheries (DPI Fisheries) and the Ecohydrology unit of the department.

Applications are assessed to determine if there are likely to be impacts on other parties, and mitigation measures may be required as part of the conditions of approval for a supply work. If harvestable rights limits are raised, this will reduce the opportunity to gauge local concerns, seek agency agreement or require mitigation measures for larger dams that would meet the new limits.

Environment

The WM Act aims ‘to protect, enhance and restore water sources, their associated ecosystems, ecological processes and biological diversity and their water quality’. It also prioritises protection of water sources and their dependent ecosystems ahead of basic landholder rights.

As the timing and pattern of river flows affect aquatic ecosystems, any changes to those parts of the flow are just as important to consider as changes to flow volume.

The following sections (and Appendix 6 in *Coastal Harvestable Rights Review—Appendices*) summarise the key considerations in assessing the impacts on water available to the environment.

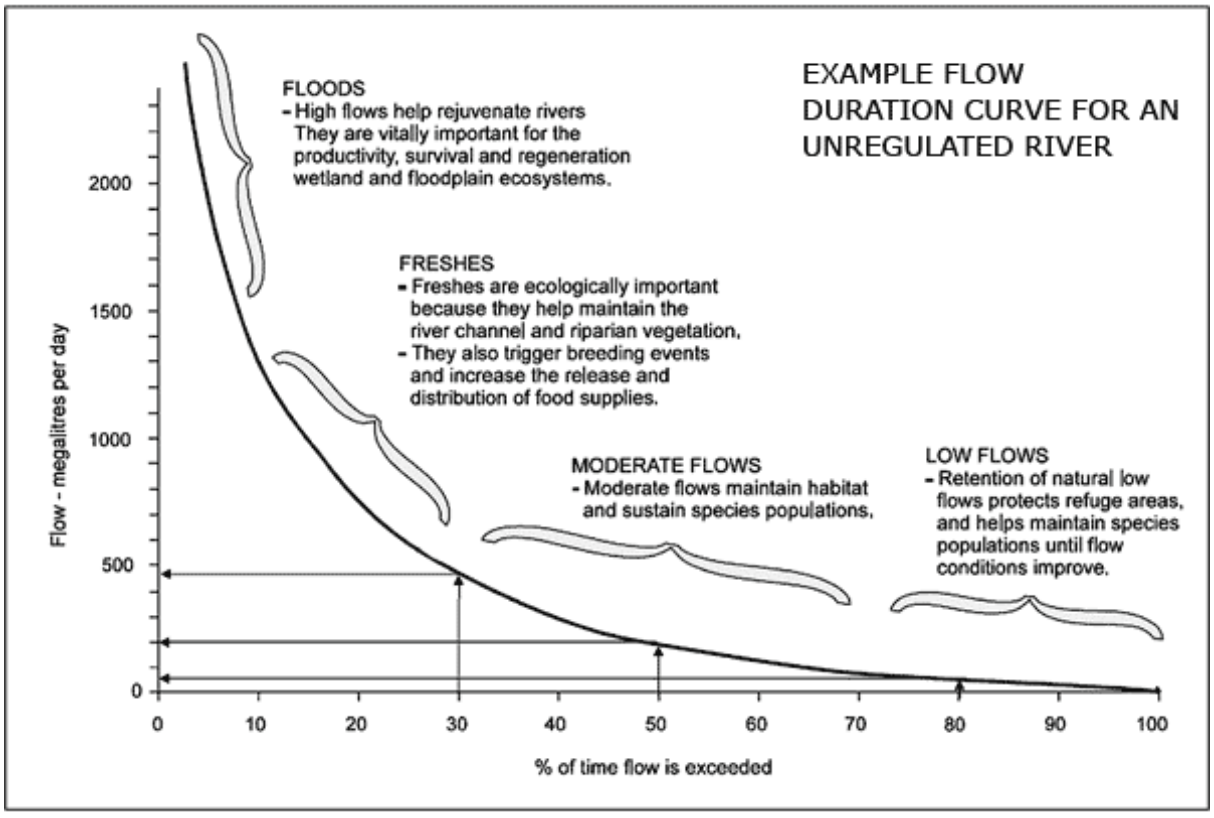
Flow regimes

Each part of a river's flow regime has unique environmental benefits (Figure 5).

The *Biodiversity Conservation Act 2016* and *Fisheries Management Act 1994* identify changes to natural flow regimes, and structures and mechanisms that alter natural flow regimes, as key threatening processes to rivers and fish habitat. The *New South Wales Marine Estate Threat and Risk Assessment Report* has also shown that reduced freshwater flows are a moderate threat to fish and fish habitat (BMT WBM 2017). A uniform increase in harvestable rights across all coastal catchments would change the frequency and duration of different flow components and could have ecological impacts on riverine and estuarine environments in some catchments. The degree of impact in each individual catchment will depend on local factors. For example, a catchment with a high run-off volume might be more resilient to changes in the flow regime.

The modelling work has found that increasing harvestable rights limits would generally:

- reduce the frequency and duration of freshes
- increase the frequency of low- and no-flow periods.



Source: NSW Government 2002a

Figure 5. Environmental benefits of different components of the flow regime

Increasing harvestable rights limits reduced the *duration* of freshes in particular. Allowing dams on third-order streams had a greater effect on freshes than increasing the harvestable rights percentage. Freshes are ecologically important, as they:

- help maintain the river channel and riparian vegetation
- transport sediment, nutrients and organic carbon downstream
- increase dissolved oxygen and break up stratification of pools

- wet banks and benches of rivers to maintain habitat, stimulating ecological processes that regulate water quality and sustain fish populations
- are an essential determinant of the health of estuaries (NSW Government 2002a, 2002b, 2002c).

Case study—Woolgoolga Creek

Effects of increased harvestable rights on freshes in low-flow season

Key points

→ Increased harvestable rights could reduce how often, and for how long, intermittently closed and open lagoons or lakes (ICOLLs), such as Woolgoolga Lake, are open to the ocean.

→ Modelling in Woolgoolga Creek shows that as the level of harvestable right dam storage increases, the number and duration of freshes in the low-flow season gradually decrease.

→ Dams on third-order streams had a greater effect on the number of freshes.

→ The reduced duration of freshes likely indicates a smaller volume of water in these events.

Want to know more? See *Coastal Harvestable Rights Review—Appendices*, Appendix 3 ('Effects on freshes' section).

Low flows are also important. They keep the river connected during dry periods, improve water quality by refreshing base flow and help maintain the salinity gradient between fresh upstream water and salty estuarine water. Without low flows, saltwater can migrate upstream, affecting habitats, plant communities, animals and water users (NSW Government 2002b).

Water quality

Water quality is an important issue the NSW Government has been working to address. It is an important factor to consider when assessing potential increases to water access that may result in changes to flows.

The modelling shows likely decreases in the duration and frequency of freshes, increases in low- and no-flow periods, and reduced inflows from unregulated tributaries during dry periods, which are likely to affect water quality. During low- and no-flow periods, pools in the riverbed contract, and water quality can deteriorate. Dissolved oxygen levels decline, algal blooms can occur and animals compete for decreasing food supplies.

Natural flow variability limits these effects. Higher flows help break up stratification, dilute salts, move dissolved organic carbon and make it more difficult for harmful algal blooms to grow. Higher water levels also inundate lower river benches, flushing carbon that stimulates riverine food webs.

The construction of additional harvestable rights dams in the upper catchments would also increase the risks to water quality from dams overtopping during high-rainfall events. In these events, nutrient-rich, potentially low-oxygen water from upstream dams can create a 'head' of poor-quality water moving down the system. This can cause blackwater events and fish deaths.

Any water-quality impacts from upper catchment dams would need to be considered if flow is reduced below the level needed to flush contaminants out of the system.

Limitations

The modelling considered surface water hydrology. However, increases to harvestable rights may also affect groundwater recharge. These impacts would vary between and within catchments, depending on the underlying geology and connectivity between surface water and the alluvium. Many dams also leak and may contribute to local groundwater recharge. The NSW government reserves a portion of recharge from extraction to allow for future growth and uncertainty in modelling.

The modelling assessed likely impacts on river flows at the end of the studied river systems. However, within-catchment flow changes also need to be considered. For example, an increase in water extracted under harvestable rights might result in a small reduction in end-of-system flows but have a larger effect immediately downstream of the dam location.

The impact of flow changes on specific ecosystem processes and environmental assets, including high ecological values and processes, also needs to be addressed. For example, a change in the duration and frequency of freshes could change the frequency with which an ICOLL opens to the ocean, affecting lake health and amenity.

Want to know more? See Coastal Harvestable Rights Review—Appendices, Appendix 6.

Town water supply

In many areas along the coast, town water supply sits at the end of river systems. It is likely that reduced system inflows would result from an increase in harvestable rights. This could reduce the security of town water supply and access to water in dry periods. As such, increasing harvestable right limits could require some water utilities to re-examine their secure yields. Secure yields identify the level of headworks capacity, including storage and transfer system infrastructure needed to meet a certain level of service for town water users.

HARC (2020) reported that reduced access to low flows due to an increase in harvestable rights could significantly impact the level of supply in existing town water storage assets. This could require immediate investment in additional temporary or permanent water-supply infrastructure to provide secure supply during droughts. Or it could require future investments to be brought forward. Either scenario would result in significant costs to water utilities and higher water charges.

Decreased river flows would also likely affect the recharge of groundwater water sources, which could affect water supplies for towns that rely partially or completely on groundwater sources.

All the case study catchments with town water supplies could be affected in some way by increased harvestable rights. See Appendix 7 in *Coastal Harvestable Rights Review—Appendices* for more details.

Case study—Wyong

Effects of more runoff being intercepted – from higher harvestable right percentages or more people using harvestable rights – on town water supply due to smaller annual flows in dry years

Key points

→ Increasing harvestable rights would have a greater impact on annual flows in dry years.

→ If uptake of existing harvestable rights rose from the current level of 51% in Wyong to 75%, the effect on mean annual flows in dry years would shift from a 4.69% reduction to a 9.61% reduction in flows.

→ If the harvestable right percentage was also increased to 20%, the effect would be a 17.45% reduction in flows.

→ Urban water extraction from the Wyong River weir is limited by a licence condition that allows extraction of a proportion of the flow. So if flows are lower, the volume available for extraction for town water supply is also lower.

Want to know more? See *Coastal Harvestable Rights Review—Appendices*, Appendix 3 ('Effects on annual flows in dry years' section).

Dams on third-order streams

Legislative controls

Legislation such as the *Fisheries Management Act 1994* prohibits the construction of dams on third-order streams without approval. Similarly, the NSW Weirs Policy discourages the construction of new weirs or enlargement of existing weirs, where the definition of "weirs" in that policy includes dams. Development consent may also be required from local councils under local environment plans, depending on dam sizes and locations. Development consent from councils may also be required for harvestable rights dams built on first- or second-order streams.

Under the WM Act and water sharing plans, licensed dams are usually not allowed on third-order streams. Any change to allow harvestable rights dams on these streams would be far more likely to affect downstream users and the environment than limiting harvestable rights dams to first- and second-order streams.

Dam safety

Dams on third-order streams need to be larger and stronger than those on smaller streams. Larger dams pose greater risks if they fail, including risks to downstream life and property.

The WM Act does not require works approvals for harvestable rights dams. This limits monitoring and management of their construction and growth. If harvestable rights dams were to be permitted on third-order streams, works approvals might be necessary to manage the higher risk of dam failures.

Base flows, fish passage and aquatic species barriers

Harvestable rights dams on third-order streams would be more likely to intercept base flows than dams on first- and second-order streams, as third-order streams usually have permanent flows.

Third-order streams are more likely to be better habitat for fish and other aquatic plant and animal species. Dams on third-order streams would potentially create barriers to the movement of aquatic species upstream and inhibit fish passage. DPI Fisheries may require fishways for dams on third-order streams to allow for fish passage.

Socio-economic considerations

The department has completed high-level, preliminary economic analysis on industries that may be affected by a change to coastal harvestable rights (see Appendix 8 in *Coastal Harvestable Rights Review—Appendices*). The analysis suggests that there would be benefits expected for some individuals and industries from additional harvestable rights. However, they could ultimately be benefits transferred from other water users reliant on water entitlements, and people and industries supplied through local water utilities.

Even within the same industry, enterprises in the upper catchment could benefit, while others in the lower catchment could see negative impacts. A detailed cost-benefit analysis would be required to identify all industries and water users potentially affected and determine the full distribution of benefits and costs across industries.

Aboriginal cultural values and uses

A recent Nation-by-Nation consultation with Aboriginal communities took place in the Murray–Darling Basin as part of the water resource planning process. This consultation identified six common themes relating to the needs and wishes of inland Aboriginal communities as they relate water use and water management. They are:

- **economic**—seek opportunities to use existing water and access to additional water (entitlements) to generate employment and business ventures
- **cultural**—acknowledge the central role of water in Aboriginal culture, and the interdependencies with economic, social and environmental outcomes
- **shared benefits**—seek opportunities to use water allocated for environmental and consumptive purposes to deliver Aboriginal outcomes and benefits where synergies exist
- **health and wellbeing**—acknowledge that water (quality and quantity) is critical to sustaining healthy communities, which underpins the ability to live on and care for Country
- **Country**—improve and enable access to Country to maintain healthy waterways
- **engagement**—embed culturally appropriate Aboriginal engagement, participation, partnerships and communication processes into water management and government decision-making.

Similar detailed discussions are yet to take place with coastal Aboriginal Nations, but it is likely that several, if not all, of these issues will apply. Consultation with coastal Aboriginal communities is happening as part of the development of regional water strategies across NSW. This will help identify the cultural uses, needs, values and wishes of Aboriginal people in relation to water in coastal, hinterland and plateau areas. Discussions and feedback from Aboriginal people and peak groups as part of this current consultation process will have other benefits as well. It will help us understand and consider the full implications for Aboriginal cultural values and uses of increasing harvestable rights in coastal draining catchments.

Ongoing Indigenous land use agreement negotiations are underway with a number of registered native title bodies corporate on the north coast. They receive all consideration to ensure the department adheres to the aspirations in their native title determinations. When and where necessary, the department will consider any native title claims on the coast in the future.

Other considerations

Urbanisation and subdivision

When land is subdivided, one of two things must happen to existing harvestable rights dams. They must be modified to meet the reduced MHRDC that applies to the smaller property size.

Alternatively, they must be licensed for the volume that can be stored in excess of the new MHRDC.

Urbanisation could result in the construction of fewer harvestable rights dams in growth areas that become serviced by town water supplies. On the other hand, subdivision of rural and semirural land could result in the construction of more harvestable rights dams as the number of individual landholdings increases, spreading the existing total dam capacity across two smaller dams.

For example, a hypothetical 100-hectare property in the Grafton area is entitled to a MHRDC of 9.5 megalitres. If this property was subdivided into two 50-hectare properties, each property would be entitled to a MHRDC of 4.75 megalitres.

Dams as artificial refuges

New dams could be constructed if an increase in harvestable rights limits was implemented, resulting in an increase in artificial refuges for wildlife in upstream areas. However, increasing artificial refuges upstream could affect the maintenance of natural, healthy riverine environments in some downstream areas, particularly during low flows in dry times.

Firefighting water supply

The NSW Government allows firefighting services to take water from available water sources when fighting fires. Farm dams are important sources of water for firefighting, as we saw in the 2019–20 fire season. Larger and/or additional harvestable rights dams in the landscape would provide an additional water source during firefighting operations. This would benefit landholders, emergency services and the surrounding communities.

Administrative and compliance considerations

Increasing harvestable rights would require a review of licensed dams that exceeded the previous MHRDC, as these dams might not require licences if they complied with the new dam limits, or might only need a smaller volume of licensed entitlement. Increasing harvestable rights limits in coastal draining catchments would allow some water users to free up licensed entitlement currently associated with their dams, which could be used to either expand their dam use or put them on the market for other water users to purchase.

The NSW Government would need to decide whether it proactively reviews licensed dams (for example there are about 600 to 700 on the north coast), or whether dam owners could seek an assessment as to whether they could alter their licensing arrangements.

It might affect licence holders who bought water entitlements to make their dams compliant with farm dam limits. It would require additional administrative effort that would need to be resourced.

From a compliance perspective, providing more access to water outside the licensing system would reduce the availability of tools for the Natural Resources Access Regulator to address compliance issues regarding water take and water use. The ability to impose conditions on licences and approvals in relation to the times, rates and circumstances around water extraction is essential to achieving balanced water sharing.

Equity

Altering harvestable rights limits raises some equity issues among various stakeholders. Table 3 highlights some of the main points that have emerged to date.

Table 3. Equity considerations

Parties	Considerations
Coastal and inland landholders	Potential change to a basic landholder right not available to all NSW landholders, due to sustainable diversion limit restrictions in the Murray–Darling Basin
Harvestable rights users and licensed users	Distribution of costs and benefits—benefits largely accrue to those outside the licensing framework, but water supply and management costs are recovered from licence holders
Harvestable rights users and other basic landholder right users	Distribution of costs and benefits—water-access benefits may accrue to one group of basic landholder right users but reduce access of other types of basic landholder right users, such as those pumping from a river or groundwater bore
Upstream users and downstream users, including environment	Distribution of costs and benefits—trade-offs between users depending on their location in the catchment
Those who can take up an increased right and those who cannot	Distribution of costs and benefits—some landholders will be unable to take advantage of increased harvestable rights because of physical limitations or other legislative restrictions on where harvestable right dams can be built

Other ways to improve water access

This review considers the effects of uniformly increasing the proportion of rainfall that can be captured, or allowing dams to be built on larger tributaries, within coastal draining catchments of NSW. However, there is a range of other ways that water access might be increased in these catchments. We outline some of these below.

Other potential harvestable rights options

Increase harvestable rights in some catchments based on risk and need

Given the differing nature and scale of potential benefits and impacts between catchments, it may be prudent to assess harvestable rights changes at the catchment or water source scale. This would require additional modelling and environmental, social and economic impact assessments to determine catchment-specific impacts and risks. This approach could prioritise catchments based on risk and needs. It could consider allowing increased harvestable rights in water sources that do not have known high ecological value and where it could avoid major impacts on other users, such as town water supplies.

This approach would, however, introduce extra complexity into the management framework. This might be confusing for stakeholders and difficult for regulators to explain and enforce. The MHRDC calculator is a consistent tool for communicating landholders' permitted dam sizes, however better promotion of the calculator and additional effort and resources would be needed to clearly and simply communicate the different arrangements or outcomes between catchments. Any analysis of benefits would need to take these factors into account.

Recalculate the MHRDC multiplier factors

The MHRDC multiplier factors were calculated 20 years ago. Recalculating the MHRDC contours with updated climatic data would better reflect changing climatic conditions along the coast. This would be a lengthy and resource-intensive process.

Regional water strategies

The department is working with WaterNSW, local councils, Aboriginal communities, key stakeholder groups and the broader community to develop 12 regional water strategies across NSW.

Regional water strategies will bring together new information and evidence with all available tools—policy, regulatory, educational, technology and infrastructure solutions—to provide an integrated water-management package that balances different water needs.

The strategies look forward over the next 20 to 40 years. They determine how much water a region will need to meet future demand, the challenges and choices involved in meeting those needs and the actions we can take to manage risks to water availability. Through better strategic planning around water, the strategies will provide resilient water resources for towns and communities, industry, Aboriginal communities and the environment.

The regional water strategies will integrate with other NSW Government programs, such as the state water strategy (in development), the NSW drought response, long-term land use plans for regional NSW, long-term watering plans and the Safe and Secure Water Program.

Work is currently underway on strategies throughout the state, including for the Far North Coast, North Coast and South Coast regions. The strategies are scheduled for completion in 2021.

Water sharing plan options

Altering water sharing plans would be a long-term option that takes considerable time. However, water-access issues could be reviewed in the 10-year review of many coastal water sharing plans. We outline below some parts that could come under review as part of this process.

Reviewing LTAAELs

The LTAAELs in most coastal water sharing plans were determined based on existing levels of entitlement. Updating LTAAELs with new information to ensure they are sustainably set would require significant time and resources. However, it could result in more water being made available in some catchments. Conversely, it could also reduce the volume available if the existing LTAAEL was found to be too high.

Water trading rules

You can find water trading rules in water sharing plans and in the Access Licence Dealing Principles. Trade is currently prohibited or restricted in many coastal water sharing plans. Reviewing or relaxing trading rules could increase water access in some water sharing plan areas.

In coastal areas, trade-related options that a water sharing plan remake process could explore include:

- reviewing trade rules, such as for short-run creeks where multiple extraction management units prohibit trade or for small management zones with limited entitlement to trade
- allowing trading in lower sections of water sources where high conservation values in upper sections can still be protected
- where water sources have no entitlement and do not allow trade, combining smaller water sources with similar rules to allow trading from within the new water source

- allowing extra entitlement in water sources that allow trades where it is scientifically determined that the long-term average annual extraction limit has not been reached
- allowing trade upstream only if it is into a dam.

The High Ecological Value Aquatic Ecosystem tool could be used to review existing trade rules and reassess high conservation values and the overlap with developed and emerging areas of industry.

Other trade-related considerations

Accurately measuring water take, including for the purposes of trade, is critical to the value and integrity of the water sharing framework. The NSW Government is implementing new policies around water take measurement and metering as part of its Water Reform Action Plan. This process may ease some trade-related issues in coastal NSW. Metering would allow water users to move from a flat-rate ('one-part') tariff regardless of use to a two-part tariff where users pay for the portion of their entitlement they use plus an entitlement charge. Metered use would also allow for more temporary trade in unregulated systems.

The Access Licence Dealing Principles apply across NSW, but coastal and inland catchments have very different characteristics and could benefit from separate water-management approaches. The department could potentially review the dealing principles to account for these differences.

High-flow conversions

High-flow conversion is when an existing licence is converted to allow extraction of a greater volume of water, but only under high-flow conditions. These are available only in selected catchments. The department could review whether these are feasible in additional areas.

Controlled allocation orders

Most water sources in NSW are fully committed, and water access licences can usually be obtained only through the water trading market. However, in water sources with unassigned water, controlled allocation orders can give the right to apply for water access licences. Licences obtained through a controlled allocation include a share component of the available unassigned water.

Unassigned water in NSW is mainly in groundwater sources, so controlled allocation processes have been only for groundwater. Although not all groundwater sources are suitable for all water uses in coastal NSW, this process could be an avenue for some landholders to access more water.

In addition to existing groundwater sources, new coastal floodplain alluvial water sources are likely to be added to some coastal water sharing plans as part of the remake process. A small amount of new groundwater entitlement may become available through the remake process.

Clean Coastal Catchments project

The NSW DPI project Clean Coastal Catchments, funded by the NSW Marine Estate Management Strategy, aims to improve the irrigation and fertigation techniques of intensive coastal agriculture. The Clean Coastal Catchments project is working with agricultural industries in key coastal areas to actively manage production and land-management issues that can degrade the marine estate. This includes improving on-farm management of fertiliser and water to improve industry productivity and profitability, while reducing effects on coastal creeks and rivers and sensitive marine areas.

Summary of options

Table 4 and Table 5 outline advantages and disadvantages of options to improve water access in coastal NSW.

Table 4. Comparison of primary options for improving water access

Option	Advantages	Disadvantages
No change to current harvestable rights	• Avoids adverse environmental impacts on other users or reliant industries resulting from a change to the current limits. • Rainfall variation is already addressed by using average rainfall run-off multipliers.	• No immediate improvement in water access in coastal NSW, which may limit agricultural opportunities along the coast. • Not all landholders are located where they can take advantage of the current policy. • Less ability to increase the amount of stored water available to fight bushfires – additional farm dams restricted by current limits.
Increasing harvestable rights percentage	• Increased water access and production/economic activity for individuals or businesses able to take up increased harvestable rights, leading to greater certainty for agricultural production and associated regional employment for these individuals or businesses. • Relatively quick to implement compared with alternative options. • More stored water available to landholders and emergency services in the event of large-scale bushfires, as recently experienced along the coast.	• Reduced frequency and duration of freshes, with ecological and water-quality effects. • Increased frequency and duration of low- or no-flow conditions, so pools stratify and stagnate. • Reduced access to water for downstream licensed and basic rights users, with more cease-to-pump days during dry periods. • Reduced run-off in heavily mined areas, with downstream effects. • Additional costs to reassess secure yields for town water supplies and/or advance scheduled infrastructure/works. • Larger dams have greater risks if they fail, and higher design and construction costs. • Potential to increase water pricing and charges. • Economic benefits to some industries or users may be transferred from downstream users. • More water taken outside the licensing and approvals framework of the WM Act. • Potential inequities between water users.

Harvestable rights dams on third-order streams	• Same advantages as the ‘Increasing harvestable rights percentage’ option above, with the addition of more locations for landholders to site harvestable rights dams.	• Same disadvantages as the ‘Increasing harvestable rights percentage’ option above, with the addition of:
		  ○ Dams subject to approval under various other pieces of legislation.
		  ○ Greater effect on permanent base flows and fish passage and could impact threatened species.

Table 5. Other ways to improve water access

Option	Advantages	Disadvantages
Catchment scale harvestable rights review	• Could improve access in some catchments without unacceptable impacts on other water users or the environment. • Improved ability to assess and mitigate risks at a smaller scale than whole of coast. • Could prioritise areas of need.	• Additional modelling and impact assessment resulting in longer timeframes. • Potential inequity across coastal draining catchments. • Higher level of rule complexity if different settings apply in different catchments.
Recalculate MHRDC multipliers	• Updating data with an extended dataset of climate would better reflect changing climatic conditions.	• Significant time and additional resources and costs required to implement. • Changes could decrease or increase MHRDC, with likely administrative costs incurred.
Pursue water access opportunities through the regional water strategies program	• Considers water access issues in context. • Risk-based and regionally tailored. • Flexible, with suite of tools available. • Includes comprehensive options analysis and socio-economic assessment. • Considers future climate scenarios.	• Longer timeframe to develop and implement than a change to harvestable rights limits.
Water sharing plans	• Considers specific individual catchment characteristics and issues. • Coastal water sharing plan remakes underway.	• Longer timeframe to develop and implement than a change to harvestable rights limits.
Review LTAAELs	• Greater certainty that total volume able to be extracted in each water sharing plan area is sustainable. • If existing LTAAEL is found to be too conservative, could provide additional water for consumptive use without affecting other users and the environment. • Improved by rollout of the non-urban metering framework.	• From the perspective of consumptive users, where an existing LTAAEL is assessed using current science as being too high, it would require a reduction in water available for consumptive use. • Additional time and resources needed for assessment.
Trade rules	• Improved access to water through trade in areas with currently restrictive trade rules.	• Requires further catchment-specific assessment.
High-flow conversions	• Where permitted, high-flow conversions would increase water availability for some licensed water users.	• High-flow conversions are not an option for all areas or landholders.
Controlled allocation orders	• May provide additional access for some water users.	• In most cases, there is only unassigned water in groundwater systems. • Coastal groundwater sources may not suit intended water use (for example, saline).
Clean Coastal Catchments project	• Improved water security through better management of existing farm water supplies. • Reduced impacts on coastal creeks and rivers and sensitive marine areas through better fertiliser management. • Assists industry to be more productive, profitable and environmentally sustainable.	• Limited scale—focused on intensive coastal agriculture.

Have your say

We recognise that the investigations to date do not provide the whole picture of the impacts of changing the harvestable rights limits. The Department will seek feedback on this discussion paper from stakeholders to ensure we identify and consider all views and issues.

This paper and appendices have been published ahead of consultation starting to allow interested parties to review them prior to consultation starting.

The public consultation and submission period of the Coastal Harvestable Rights Review will commence in early 2021. Details about the consultation process, including specific dates and how you can provide your feedback will be provided on the Department's website before consultation commences.

Your input to this review will help ensure that decisions about improving access to water are well-informed and consider all the potential drivers, impacts and issues.

Information about the consultation will be available on the Department's website at dpie.nsw.gov.au/coastal-harvestable-rights-review.

Next steps

The NSW Government is committed to ongoing engagement with the community and businesses about improving access to water, and this discussion paper is part of that conversation.

Submissions we receive in response to this discussion paper will inform:

- considerations about whether to increase harvestable rights limits
- identification of other possible ways to improve access to water
- the final report for the Coastal Harvestable Rights Review.

The department will release a summary of all community feedback provided as part of the consultation and submission process in the months that follow the submission period.

After reviewing the submissions and other feedback, the department will make recommendations to the Minister for Water, Property and Housing on whether existing harvestable rights limits should be increased and if further studies are required.

Glossary

Term	Definition
Coastal NSW/coastal catchments	Catchments in NSW that drain to the coast.
Cease to pump	Cease-to-pump rules require users to stop taking water when flow declines below a set level.
Fertigation	The technique of supplying dissolved fertiliser to crops through an irrigation system.
Freshes	Freshes are higher flows in a river that stay within the banks but rise to wet the banks and the instream benches and bars that make up the river.
Gross margin	The gross income from an enterprise less the variable costs incurred in achieving it. It does not include fixed or overhead costs, such as depreciation, interest payments, rates or permanent labour.
HARC	Hydrology and Risk Consulting Pty Ltd.
Harvestable rights limits	A term referring to both the harvestable rights percentage and the location (specifically, stream order) where harvestable rights dams may be built as set out in the Order.
Harvestable rights percentage	The percentage of average annual regional rainwater run-off landholders have the right to capture under the Order.
ICOLLs	Intermittently closed and open lakes and lagoons
Inland	Areas of NSW that do not drain to the coast.
LTAAEL	Long-term average annual extraction limit
ML	Megalitre (1 ML=1,000,000 litres)
NSW DPI	NSW Department of Primary Industries
Order/The Order	Harvestable Rights Order—Eastern and Central Divisions
The department	NSW Department of Planning, Industry and Environment—Water (formerly NSW Department of Primary Industries—Water and NSW Department of Industry—Lands and Water)
WM Act	*Water Management Act 2000*

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