Budget Estimates 2021-22 – Monday 1 November 2021

Portfolio Committee No. 4 – Agriculture and Western NSW

Responses to Questions on Notice

Question 1 (Page 4)

The Hon. MICK VEITCH: Because of the proximity to the township, is there a campaign that is conducted, then, for the population of Young to give them the opportunity for vaccination?

Mr DUGALD SAUNDERS: That would be a Health question. But given the proximity to town, you would think that would be part of an overall health approach. The main messaging becomes around mosquitoes. That is for whether it is piggeries or just homes—to not have water lying around, if possible, and trying to remove any breeding ground for mosquitoes, because that is the main risk. It is not the pigs; it is the mosquitoes.

The Hon. MICK VEITCH: Of course there is a rush now on—

Mr DUGALD SAUNDERS: DEET.

The Hon. MICK VEITCH: —all sorts of protections, such as Bushman and the like. The floods in the Hawksbury, for instance—there is a lot of water lying around now on those river flats. It is a pretty good spot to breed mosquitoes, clearly. As I understand it, there is a piggery near Windsor. Has that piggery been assessed at all?

Mr DUGALD SAUNDERS: I am not sure. I will have to ask Scott that one.

SCOTT HANSEN: We can find out whether there has been deliberate testing for that one.

ANSWER

Mosquito testing is being undertaken across the state and has shown low numbers of Culex in the Hawkesbury area. Only the Culex mosquito carries Japanese encephalitis (JE), and this is different to the flood mosquito (Aedes). The NSW surveillance is targeting piggeries with pigs that show clinical signs. Any pig showing clinical signs will be tested. To date (29/03/22) there have been no investigations of disease within the Greater Sydney area. Pigs are the sentinel, and it is more effective to undertake mosquito monitoring.

Question 2 (Page 11)

The CHAIR: I appreciate that. I might, through you, ask Mr Orr just some basic details about LLS' use of category D firearms and then I will go to the heart of the matter. Mr Orr, perhaps on notice if you do not have it, how many semiautomatic centre-fire firearms does Local Land Services possess?

STEVE ORR: Thanks for the question. I will take that on notice.

The CHAIR: Can you also take on notice what the make and models and calibre of those firearms are?

STEVE ORR: Sure.

The CHAIR: Can you tell us in what LLS regions those firearms are located, on notice?

STEVE ORR: Yes. The CHAIR: Obviously, without disclosing specific details, are these firearms stored in LLS employees' homes or are they in LLS offices?

STEVE ORR: My understanding is that they are stored in LLS offices, but I will confirm the range of questions which you have.

The CHAIR: When you are confirming that, if they are stored in LLS offices and not the principal place of residence in accordance with the firearms regulations, what additional safety measures are you putting in place to ensure safe storage? And, perhaps on notice, have all LLS firearms safes been inspected by NSW Police Force and when?

STEVE ORR: Yes, sure. Obviously the storage and management of firearms is critically important, so LLS takes that very, very seriously. But in terms of your specific questions and the details within those questions, I will take those on notice and come back to you. The CHAIR: Are the permits that have been issued to LLS for 12 months like non-government licences?

STEVE ORR: Again, I will confirm that. I will take that on notice, Mr Banasiak.

The CHAIR: Can you perhaps confirm whether they were granted under section 28 (g) of the Firearms Act as a special commissioner's permit, I think they call it now a general permit? If you could that would be great.

STEVE ORR: Sure.

ANSWER

Local Land Services have 45 semi-automatic centrefire firearms consisting:

- 13 semi-automatic Benelli 12 gauge shotguns
- 26 FN Herstal SCAR-H prohibited semi-automatic rifles
- One semi-automatic rifle Lewis Machine and Tool,
- Two Beretta 1200F Semi-automatic 12ga and one Mossberg 1200AT 12ga.

- Two Remington 870 Express shotguns

They are located in the LLS Regions listed below-

- Hunter LLS
- Central Tablelands LLS
- Riverina LLS
- North West LLS
- Northern Tablelands LLS
- South East LLS
- Western LLS
- Central West LLS

All semi-automatic rifles are stored at dedicated LLS Safe Storage Addresses as inspected by the NSW Police Force Firearms Registry.

The firearms are on a General Permit of a 5 year duration. Confirming that the General Permit is granted under Section 28g of the *Firearms Act 1996.*

Question 3 (Page 11)

The CHAIR: I pass up a series of emails between Mr Wayne Jackson from the New South Wales Firearms Registry. It went to a series of people, including a Mr Sears from LLS. While you are having a read of that, Mr Orr, is Mr Sears still working for LLS? Just so we get a baseline.

STEVE ORR: I would need to confirm whether or not Mr Sears is working for LLS. Mr Kelly, do you know?

ROB KELLY: We will take that on notice.

ANSWER

Mr Seears is no longer employed by LLS.

Question 4 (Page 11)

The CHAIR: I will ask the secretariat to give you an extra copy. Just to help you, Minister, this is an email that was sent by Mr Wayne Jackson from the New South Wales Firearms Registry to a series of people, including LLS and National Parks, essentially soliciting support for a project which undermines any non-government category D licence holder in this State getting access to a category D firearm. I draw your attention to the bottom of page 3 where he has cleverly crafted a statement from whoever this was emailed to to basically fill in the blanks and sign it. If they sign it they are saying they do not support anyone who is not part of government having a category D firearm for pest control.

STEVE ORR: Yes. Again, Mr Banasiak, that is from 2014 or 2015.

The CHAIR: Yes, 2015.

STEVE ORR: I will take that on notice and respond to your questions, hopefully in the afternoon.

ANSWER

The decision to issue a firearms licence of any category is a matter for NSW Police Force. LLS does not make recommendations to the firearms Registry regarding access and use of Cat D firearms.

Question 5 (Page 12)

The CHAIR: Minister, can you see how that looks? Potentially this employee—I do not know whether he received authority to collude with Mr Jackson or not, but it looks like LLS has essentially conspired with the New South Wales Firearms Registry to disadvantage non-government pest controllers with their category D licence applications.

Mr DUGALD SAUNDERS: You are talking about something that is eight years ago. That is a long time ago.

The CHAIR: Yes, but that has reverberated through the management of this problem—or mismanagement of this problem—that we now face.

STEVE ORR: Mr Banasiak, I guess the general comment would be it is up to the Firearms Registry to make those sorts of decisions. Obviously LLS plays a significant role in relation to pest animal control. We do use firearms, as you have alluded to. Those firearms from my perspective are managed to the highest standard in line with what we as an organisation need to do. But in relation to this specific matter and whether the staff members involved even continue to work with LLS, I will come back to you on that.

ANSWER

The decision to issue a firearms licence of any category is a matter for NSW Police Force. LLS does not make recommendations to the firearms Registry regarding access and use of Cat D firearms.

Question 6 (Page 12)

The CHAIR: Thank you. Minister, I might switch to native title. I know it is not within your purview, but what is your understanding of native title's impact on rural land ownership? I have received a high number of constituent concerns that they have gone through the process of selling their agricultural land, they get to the point of cooling off and then they find out at the very end—oh no!—there is a native title claim. And they cannot sell their land and transfer it to someone else to be used for agricultural purposes. What is your understanding of the scope of that and has your department done any assessment on the impacts on agriculture?

Mr DUGALD SAUNDERS: I am not aware of any large-scale problems that that is causing, but the director general might have an indication of how many people have brought this forward.

SCOTT HANSEN: No. I would have to take it on notice. I have got to say I have not heard any concerns on that front recently, Chair. I do not know whether the agriculture commissioner in the discussion around land use, whether that came up at all in any of your conversations or consultations with industry?

DARYL QUINLIVAN: No. I cannot recall it being raised by anyone at all during my consultations

ANSWER

Native title does not apply to land held under freehold ownership. Freehold ownership is an act of exclusive possession which results in Native Title being extinguished under the *Native Title Act 1993* (Cwth). Certain leases in NSW also extinguish native title, including some Western Lands Act leases for agriculture. Where Native Title remains the negotiation of individual tenures or Indigenous Land Use Agreements which govern the future use of Crown land are undertaken by the NSW Crown Lands Department.

Question 7 (Page 12)

SCOTT HANSEN: But if there are specific cases you would like to talk about after, I am happy to find out what we can on that.

The CHAIR: Yes, we might bring that up in the afternoon session. Did you have something to add, Mr Barnes?

GARY BARNES: I was going to say that native title is usually triggered when someone sells the land and the purpose for which the land is going to be used is different to what it currently is being used for. I think it would be unusual if it was agriculture for agriculture. But we can find out about that and get back to you.

ANSWER

Native Title does not apply to land held under freehold ownership. However certain Crown Lands may be either under Native Title claim or have been held to have Native Title. When the future tenure of that land is being negotiated considerations will include impacts on Native Title, any Indigenous Land Use Agreements which might apply, and whether compensation is payable. As Native Title is limited to Crown Land the negotiation of these future tenures is undertaken by the NSW Crown Lands Department.

Question 8 (Page 12)

The Hon. MICK VEITCH: Speaking of specific instances, Minister, you might want to take this question on notice and at some stage maybe Mr Hansen could get back to us: In light of the Windridge piggery announcement last night on the news, can you produce us an update of piggeries that have been identified in New South Wales at this time, as of today? You can come back to us with that.

Mr DUGALD SAUNDERS: We will probably take that on notice with the exact number. It may have changed again this morning.

SCOTT HANSEN: It is 15 piggeries. Rather than giving the individual ones here, we can tell you that they are spread from the very north of the State, as far north as Tenterfield, to as far south as the border.

The Hon. MICK VEITCH: How far west?

SCOTT HANSEN: I would have to come back to you about the furthest west one.

ANSWER

There are 27 affected piggeries (as of 29 March 2022) across Northern Tablelands, Central Tablelands, Central West, Riverina and Murray Local Land Services regions. The western-most piggery identified in NSW is located in the Murray River Local Government Area.

Question 9 (Page 17)

Mr DAVID SHOEBRIDGE: How much did Forestry NSW spend on controlling introduced animals last financial year? How much did it spend?

Mr DUGALD SAUNDERS: Anshul, have you got the figures on that?

ANSHUL CHAUDHARY: I would like to actually explain that a bit, Mr Shoebridge.

Mr DAVID SHOEBRIDGE: No, just tell me the dollar figure.

ANSHUL CHAUDHARY: If I can, please. I think it is an important point.

Mr DAVID SHOEBRIDGE: How much did it spend on controlling—

ANSHUL CHAUDHARY: I can get you that information as well, but—

ANSWER

Expenditure on pest and weed management is published in Forestry Corporation's Sustainability Report each year. This is available on Forestry Corporation's website.

Question 10 (Page 18)

Mr DAVID SHOEBRIDGE: There is a 55,000-tonne bulk carrier currently docked at Eden to take export woodchip from our native forests to a port in southern China, I think. What are New South Wales taxpayers getting in return for the 55,000 tonnes of our native forest that is being ground up and chipped, and that will be exported? How much do we get in return for that?

Mr DUGALD SAUNDERS: Your assertion that native forests are managed for woodchips is way off the mark.

Mr DAVID SHOEBRIDGE: I am asking you about the ship.

Mr DUGALD SAUNDERS: I am just telling you that I disagree with your assertion.

Mr DAVID SHOEBRIDGE: I am asking you about the ship that is docked at Eden to take 55,000 tonnes of woodchipped native forests—from our public forests. How much are we getting in return for that amount of destruction of our forest for those woodchip exports, Minister?

Mr DUGALD SAUNDERS: I disagree with the assertion in the question, but we can find out what the value of that is.

ANSWER

Forestry Corporation does not directly export timber from Eden. The Eden mill facility is owned and operated by a private company called Allied Natural Wood Exports (ANWE). ANWE has several Wood Supply Agreements (WSAs) with Forestry Corporation of NSW for the supply of hardwood sawlogs, pulp logs and softwood log products and also sources timber and wood products from a range of other forest growers. Questions about the value or provenance of material on an individual ship are a matter for ANWE.

Question 11 (Page 18)

Mr DAVID SHOEBRIDGE: So where are the 55,000 tonnes of export woodchip coming from that are about to be pumped into Eden?

Mr DUGALD SAUNDERS: That would be a by-product of the selective harvesting in our native forests.

Mr DAVID SHOEBRIDGE: That cannot seriously—

Mr DUGALD SAUNDERS: Are you disagreeing with that fact?

Mr DAVID SHOEBRIDGE: I am. By bulk, the primary outcome for many of the logging operations in New South Wales is export woodchip. You do not understand that, Minister?

Mr DUGALD SAUNDERS: I disagree.

Mr DAVID SHOEBRIDGE: Alright. But you do not have any figures or any data to respond to it?

Mr DUGALD SAUNDERS: Mr Chaudhary, I am sure, can provide you detail, and he just has.

Mr DAVID SHOEBRIDGE: Give us the detail, Mr Chaudhary.

ANSHUL CHAUDHARY: I will provide you the breakdown there, Mr Shoebridge.

Mr DAVID SHOEBRIDGE: See, he did not provide the detail, Minister. It did not happen.

ANSHUL CHAUDHARY: The Minister is correct. I will get that for you, Mr Shoebridge. But can I just clarify—

ANSWER

The primary product from hardwood timber harvesting operations in State forests is sawlog. Hardwood forests division sales by product group and timber type are reported annually in the Sustainability Report on Forestry Corporation's website.

Question 12 (Page 19)

Mr DAVID SHOEBRIDGE: Can tell us how much of the red gum went on firewood?

SCOTT HANSEN: If you give me another bit of time to google, I will probably be able to find that as

well.

The CHAIR: Perhaps on notice you can come back in the afternoon and provide that.

ANSWER

The breakdown of products harvested under the Riverina Red Gum Integrated Forestry Operations Approval by category is published in the annual NSW Forestry Snapshot Report on the Environment Protection Authority website.

Question 13 (Page 22)

The CHAIR: Awesome. Thank you, Minister. I turn to trout cod closures. You might be aware that there is an annual total closure on trout cod, and that is coming up. It is normally for about three months. Are you aware of that, Minister?

Mr DUGALD SAUNDERS: I am not a trout fisherman but, yes, continue.

The CHAIR: Are you aware that this is a total closure? I have received several representations from South West Anglers and also businesses in these areas where they are saying that for three months they estimate a 70 per cent downturn in their income because of that total closure. You are not only saying, "You cannot take trout cod", you are saying that kids cannot go in there and fish for yellow belly, kids cannot go in there and fish for carp. Minister, what is the status of the trout cod recovery plan, because the latest data is from 2017. I do not want to dwell on the former Minister, but he committed to an update being done in 2021?

Mr DUGALD SAUNDERS: I might have to throw to Mr Sloan on this to see what the update is. Our restocking program is incredibly good, but he might have some more detail.

SEAN SLOAN: Thanks for the question, Minister. There has been a review. The species is still conservation dependent. I think the best thing I can do is take that on notice and come back with some more information, with an update, if that is okay.

The CHAIR: While you are taking it on notice, can you take on notice whether you believe from that research that a total ban is required or can we go to a no take of trout cod but still allow people to go in and fish for other species? Can you come back with some comments on whether that is possible?

Mr DUGALD SAUNDERS: Yes, I am sure we can do that.

ANSWER

Trout Cod are a listed Threatened species (at both state and Commonwealth level) and are protected from all forms of fishing all year round. The Trout Cod Protection Area was established between Yarrawonga and Tocumwal to protect the last remnant natural population of Trout Cod in the Murray Darling Basin. The fishing closure is designed to limit the impact of incidental capture on Trout Cod during breeding season as it can still impact on the ability of fish to breed during that period. The 3-month closure to all forms of fishing is designed to maximise breeding success. DPI has completed a socio-economic study into the impacts of the seasonal closure. The findings from this study and the review of the Trout Cod Recovery Plan will be shared with the local community, including the South-West Anglers Association, this year at face-to-face meetings which have been delayed due to COVID restrictions.

Question 14 (Page 22)

The CHAIR: Are you aware that the Commonwealth fish trawl have lower standards in terms of net size and meshing size?

Mr DUGALD SAUNDERS: This is about protecting fish, which this will do. It will not allow Commonwealth fisheries in any closer. It will allow New South Wales fisheries further out but not vice versa. It protects fish stocks and I think achieves everything it needs to achieve. No-one has reached out particularly saying they have any further concerns about where this is headed at the moment.

The CHAIR: On notice, can you provide the discard rates for all species for the past five years through the Southern Fish Trawl and also on notice can you provide any advice your department has received from the Commonwealth trawl about their sustainability for such species as dory, snapper, et cetera?

Mr DUGALD SAUNDERS: Yes, we can do that through Mr Sloan this afternoon.

ANSWER

Total discard rate over 18 months of observer data obtained from the Southern Fish Trawl fishery over the past five years was 60% was discarded, largely due to non-commercial species. The discard rate for commercial species (quota and non-quota species) ranges from 1- 49%.

Overall, the discarded portion of observed catches comprised 102 species, with Tiger Flathead (20%), Ocean Jacket (13%), Gurnard spp. (Triglidae, 10%) and Eastern Fiddler Ray (6%) accounting for approximately 49% of total discards (by weight all trips combined)

School whiting 4.4 ± 1.4 t; 4-5% of total catch – discard is due to the size of the fish with smaller fish which have less market value being discarded.

Trevally 6.1 ± 1.8 t; 12-16% of total catch – discards are due to undersized animals that cannot be retained.

Flathead 47.3 ± 14.8 t; 40-49% of total catch - discards are due to both trip limits and size limits, with 60% of discards due to NSW trip limits.

The Commonwealth participates within the cross-jurisdictional framework that operates to develop stock status assessments within the Status of Australian fish stocks (SAFS) process. Commitments under relevant NSW and Commonwealth legislation for the development of assessments are required under the total allowable fishing provisions of the Act. Any concerns regarding particular species are identified within the outputs of these processes.

Question 15 (Page 25)

The Hon. MICK VEITCH: Mr Chaudhary, are you aware of any maps of the new proposed corridor going through Forest Corp land?

ANSHUL CHAUDHARY: I personally have not seen any maps. But I know that my office is working with the stakeholders there. They might have seen something.

The Hon. MICK VEITCH: Can we take on notice whether or not that is the case?

ANSHUL CHAUDHARY: Yes. Sure. I will get that for you

ANSWER

Forestry Corporation is a stakeholder in the HumeLink project and has seen a range of maps of proposed routes, including the proposed corridor currently published on the HumeLink website that impacts some areas of State forest.

Question 16 (Page 27)

The Hon. MICK VEITCH: Has your department provided any data or research that would inform the development of these water sharing plans?

Mr DUGALD SAUNDERS: I am sure they would have to the water Minister.

SCOTT HANSEN: I might ask Mr Sloan to comment on that.

SEAN SLOAN: In DPI Fisheries we do have a role to provide technical input into the water sharing plans. We do not have a decision-making role; we have got an advisory role. That is around the impact on native fish. So we are involved in that process and we will continue to be involved in the process.

The Hon. MICK VEITCH: That is fisheries, but what about farmers? For instance, on the lower Hunter I think there are turf farmers, around Maitland there are market gardeners, and the Manning have some issues as well which they are approaching our offices about. Irrigated agriculture is quite a complex arrangement. Are you at all—

Mr DUGALD SAUNDERS: I mean, they are all taken into account obviously through the water Minister, so they are not forgotten about. But if you are asking, "Have we specifically provided advice?" I am not sure that we have.

SCOTT HANSEN: I would have to come back to you with what formal or informal mechanisms for sourcing of information from us has been underway.

ANSWER

DPI undertakes limited flow analysis (usually a frequency analysis to understand the variability of flows; this data used in this analysis is publicly available from the WaterNSW Water Information Hub) to help with understanding of the effects of the proposed changes on the access to agriculture irrigation water. This analysis is not routinely provided to DPE Water but used “in house” to improve DPI’s understanding of the effects of the proposed changes on the access to irrigation water. DPI does not have a decision-making role, only an advisory role. DPI sits on both the inland (Regional) and Coastal Water Resource Planning and Policy Working groups as well as sits on the Regional Water Senior Officer Group which endorses plans for public exhibition

Question 17 (Page 28)

Ms ABIGAIL BOYD: Yes. In terms of animal agriculture effluent flowing into pastures and waterways during the floods, is that something you have had oversight of? Did DPI NSW issue any advice to producers about that effluent overflow?

Mr DUGALD SAUNDERS: I do not know. Mr Hansen, do you want to handle it? The EPA is the authority that looks after any of that type of thing. But in a flood situation there is not really any control able to be provided anyway about effluent and/or animals being swept out to sea or down river. But I am not sure. We will, I guess, at some point get a report on what that looks like.

SCOTT HANSEN: In an emergency response, there are actually functional areas that are established to focus on different areas. One of those is in the environmental functional area. It takes responsibility for pollution events, whether that is animal effluent or actually chemical drums and other residues out of streets and industrial sites and so forth. So that will be a major, swift change in the focus to doing everything from water monitoring through to soil monitoring and testing to be able to provide advice to the community about remediation and clean-up.

Ms ABIGAIL BOYD: Perhaps you could provide on notice whether there have been any incidents reported in relation to animal agriculture effluent into our ponds and waterways and just any details you can provide.

SCOTT HANSEN: I am sure there are going to be masses. There are whole agricultural areas that are still underwater now and that underwater is water that is flowing into river ways, rivers, estuaries and streams.

Mr DUGALD SAUNDERS: Along with human waste—

Ms ABIGAIL BOYD: Fair enough. Then can I rephrase that to if you could let me know on notice exactly how the oversight mechanism works with that to make sure that that is something that will be dealt with in the right way?

SCOTT HANSEN: Definitely.

ANSWER

The Department of Planning and Environment is the lead agency in protecting water quality in NSW. They run the Beachwatch program monitors and reports recreational water quality at swimming sites in the Sydney region, and this program partner with councils and wastewater managers for regional swimming sites along the NSW coast. Water samples are collected and tested for bacteria, showing signs of faecal pollution, and whether it is safe for swimming. Public water supplies in NSW are monitored in line with the Australian Drinking Water Guidelines. Water quality information is available from:

- Sydney Water Corporation
- Hunter Water Corporation
- Local water utility (council) in regional NSW

Question 18 (Page 30)

The Hon. EMMA HURST: Yes, of course. Minister, why does the New South Wales Government not fully fund the enforcement of criminal legislation to protect animals when every other piece of criminal legislation is properly funded by government?

Mr DUGALD SAUNDERS: That is not something I have been involved with previously. It is something I am happy to take on notice. I do not have an answer for that.

ANSWER

The Hon. Dugald Saunders, MP has committed to a review of the current government funding arrangements to *Prevention of Cruelty to Animals Act 1979* (POCTA) enforcement agencies.

The NSW Government provides annual grants at the end of each financial year to several organisations. Since 2006-2007, RSPCA NSW has received an annual grant of $424,000/year and Animal Welfare League NSW (AWL) has received an annual grant of $75,000/year. This funding will be reviewed as part of the Animal Welfare Reform process and Minister's commitment.

In addition to annual grants, Authorised Charitable Organisations (ACOs) under POCTA have also received special compliance funding: RSPCA NSW received $400,000 in 2020 to establish the Puppy Factory Taskforce and $375,000 in 2019/20 to employ extra inspectors to assist with drought-related livestock cases.

ACOs also receive additional government funding for infrastructure projects, including $7.5million in 2011 for the RSPCA NSW Yagoona shelter rebuild and $10.5million in 2021 to upgrade RSPCA NSW facilities across the state.

Question 19 (Page 31)

The CHAIR: Minister, I note from the allocation of Acts that you are no longer jointly responsible for the Rock Fishing Safety Act of 2016.

Mr DUGALD SAUNDERS: I thought I still was.

The CHAIR: No. According to the allocation of Acts, you are not. What does that mean for DPI Fisheries enforcing the Act?

Mr DUGALD SAUNDERS: Sean?

SEAN SLOAN: For some time, actually, the Minister for Agriculture has not been responsible as the lead administrator of that legislation.

The CHAIR: He is no longer at all though. He has completely fallen off.

SEAN SLOAN: That is correct, and that was quite some time ago. Fisheries started out as the lead and then at a point in time that responsibility was passed over to local government and to police. DPI Fisheries officers have a role as cross-authorised officers to be able to enforce those rock fishing safety rules, but we are not the lead. The lead organisation is local government, so it is the Minister for Local Government.

The CHAIR: On notice, when did the Minister fall off in terms of total responsibility, or any responsibility at all? Because it seems like it only just happened in February when the new ministerial portfolios were set up.

SEAN SLOAN: I can clarify that—

Mr DUGALD SAUNDERS: I think it might have been 2018.

The CHAIR: When you completely fell off as Minister for fisheries?

Mr DUGALD SAUNDERS: Yes, I think in 2018 it was handed from the Minister for Primary Industries to the Minister for Local Government and the Minister for Police and Emergency Services. But we can check.

The CHAIR: Just confirm that in 2018 you had no responsibility at all.

ANSWER

In 2018 administrative responsibility of the *Rock Fishing Safety Act 2016* was transferred from the former Minister for Primary Industries to the Minister for Local Government and the Minister for Police and Emergency Services.

Question 20 (Page 31)

The CHAIR: Take this as a comment, Minister, but I think you might have got the distribution of the responsibility for this Act wrong, given the lack of effort I see from local government in my own area, which has had significant rock fishing deaths. I turn to the Kamay ferry between La Perouse and Kurnell. On 9 August 2021 a senior fisheries manager, Scott Carter, sent a letter as part of your submission to the EIS, where you basically said "DPI Fisheries are currently unable to support this proposal" and listed several reasons why. Is that still the position of your department and you, Minister—that the ferry is going through a recreational fishing haven and destroying critical habitat for fish?

Mr DUGALD SAUNDERS: I will have to pass to Sean on that one.

SEAN SLOAN: Thanks, Minister. That is correct. We were consulted on the proposal and under the Fisheries Management Act we have got responsibilities for key fish habitats like seagrass. There is important seagrass habitat in the area so we raised concerns about the impacts of the development on seagrass. It does not mean that we cannot support it in its entirety; it is a concern that was raised so that obviously that can be taken into account as part of the development application review. The other matter that we raised was access by recreational fishers to the area as well, given that it is in a recreational fishing haven and we have made the point that it is an area that can allow for both activities—the ferry activity and recreational fishing—to coexist.

The CHAIR: On notice can you perhaps come back and answer whether any of those specific concerns listed in this letter—I am assuming you know which letter I am referring to—have been resolved with your discussions with Transport for NSW?

ANSWER

It is important to note that the Kamay Ferry development proposal is a State Significant Infrastructure project and DPI Fisheries has an advisory role only. The Department of Planning and Environment (DPE) is the consent authority for this project. As such DPI Fisheries advice is considered in the final DPE decision.

The department's advice, that was outlined in the letter, is our initial response to the Environmental Impact Assessment. Following this advice, Transport for NSW has provided further information to the DPE and DPI Fisheries which has clarified these matters and/or agreed to draft conditions of consent that will address the department's concerns.

In relation to the main points raised in our initial response:

1. **Lack of information on type of vessels and usage:** Transport for NSW, via their response to the submissions process and amendments to the Environmental Impact Assessment, advised that the impact assessment had

taken into account the maximum size (hull shape, draft and propulsion mechanism) ferry to be used. This information was used by Transport for NSW to determine the likely impacts from the use of the ferry and associated infrastructure. DPI Fisheries was satisfied that the full extent of direct impacts had been determined, however, to ensure all direct and indirect impacts are taken into account the department also recommended a 12-month post construction and operational impact assessment be undertaken to inform the Marine Biodiversity Offset Strategy (MBOS) for this project. This proposed condition seeks to ensure all impacts, from construction and operation, are addressed and either mitigated or offset. The DPE and the Commonwealth Government have supported this approach.

2. **Lack of biodiversity offset strategy:** The impact assessment amendments undertaken via the above process have led to the development of a Marine Biodiversity Offset Strategy (MBOS). This Strategy now addresses the requirements of the *Fisheries Management Act, 1994* and the Commonwealth *Environmental Biodiversity Conservation Act,1999* and DPI Fisheries has been advised that it will be a condition of approval determined by the DPE. This is an adaptive Strategy that will be amended as needed to ensure all impacts to fish habitat are considered and offset if required. The MBOS will be developed and reviewed by an interagency committee including DPI-Fisheries management and research, and an independent scientist with experience in seagrass rehabilitation.

3. **Lack of information on recreational and commercial moorings:** Transport for NSW has addressed this issue by indicating no new moorings are planned as part of the proposal.

4. **Navigation channels and vessel pathways:** This issue was addressed as part of the Environmental Impact Assessment amendments process, the post construction and operation assessment condition and development of the adaptive Marine Biodiversity Offset Strategy.

5. **Seven-part test determination (threatened species assessment):** This issue was addressed as part of the Environment Impact Assessment response to submissions and amendment process. The DPE draft approval conditions have been developed to ensure all impacts to key fish habitat and threatened fish species (including seagrass) will be mitigated and or offset via the Marine Biodiversity Offsets Strategy.

6. **In relation to recreational fishing access on the wharves** - The 9 Aug 21 letter advised that DPI recommends that recreational fishing activity on the Kamay ferry wharves in Botany Bay be managed using similar wharf management arrangements used as part of the Clean, Safe Wharves Program in Sydney Harbour, that is, fishing should be permitted from the ferry vessel berth as well, except for the short periods when in use by a ferry. The letter also stated Inscription Point and Frenchman's Bay are popular areas for boat-based fishing which should be considered by Transport for NSW during the assessment. Transport for NSW have previously confirmed that fishing will be permitted on the wharves (except for the ferry vessel berth).

Question 21 (Page 32)

The CHAIR: Minister, does it concern you that some of the key scientists who are involved in protecting and doing research on these grasses, particularly this protected grass known as posidonia australis, have basically thrown their hands up and said this is going to destroy those seagrasses and there is not much we can really do about it and we are just going to have to wear it? Does that concern you?

Mr DUGALD SAUNDERS: It seems odd to take that approach. I will leave this with the department and we will find out a bit more detail.

ANSWER

DPI cannot comment on the views of independent scientists and this project. The department can advise that DPI-Fisheries Marine Ecosystem scientists have been involved throughout the impact assessment process, development of draft conditions of approval, and the development of the Marine Biodiversity Offsets Strategy. The Strategy and the governance framework around its implementation have been developed based on the best available science and knowledge of seagrass rehabilitation. This has included scientists from the University of NSW who are actively involved with DPI-Fisheries in the rehabilitation of *Posidonia australis* in NSW.

Question 22 (Page 33)

The Hon. MICK VEITCH: Minister, one of your predecessors spent a fair bit of time on the commercial fishing industry. I am wondering if you might be able to tell us, or take on notice, how many commercial fishers are currently involved in commercial fishing in New South Wales?

Mr DUGALD SAUNDERS: I have met with the Professional Fishers Association a couple of times now and regard that as a really vibrant industry, which has gone through some pretty tough times. I do not have the exact numbers of how many are involved but I can take that on notice.

ANSWER

Number of commercial fishing licences – 1,039. Number of Fishing Businesses – 1,054

(Detail current on 15 March 2022). Not all commercial fishing licence holders are active. Commercial fishers need to be nominated against a fishing business to be able to fish endorsements under that business. At any given time not all fishing businesses are fishing under all, or possibly any, of the endorsements held under fishing business.

Question 23 (Page 35)

The Hon. MICK VEITCH: Thank you. Minister, very early on in your tenure, not long after you got your feet under the desk, I am hoping you received my piece of correspondence regarding weeds and pests. None of these people needs to roll their eyes. Can I ask how many compliance actions Local Land Services has undertaken on public land managers since the Biosecurity Act was introduced back in 2017? Mr

DUGALD SAUNDERS: I will have to ask Mr Orr to take that one.

STEVE ORR: And I will have to take it on notice, Mr Veitch.

ANSWER

LLS is not responsible for biosecurity compliance in relation to weeds.

Question 24 (Page 36)

The Hon. MICK VEITCH: Thanks, Mr Orr. Minister, how many TSRs have access agreements in place for Indigenous people?

Mr DUGALD SAUNDERS: That is an operational thing.

The Hon. MICK VEITCH: I do not think it is, Minister, with all due respect. This is a pretty serious issue for our First Nations communities. You are from Dubbo; you would know exactly how important the cultural significance of TSRs is. This is actually an issue that I think should be elevated to a ministerial level. It is quite serious.

Mr DUGALD SAUNDERS: Yes, but I do not know the actual number. If you are asking what number, I do not know. Mr Kelly, have you got ideas of that?

STEVE ORR: Do you know, Mr Kelly?

ROB KELLY: No. We will take it on notice.

STEVE ORR: We will take it on notice and come back to you this afternoon, Mr Veitch

ANSWER

There are no access agreements in place for TSRs in NSW as no Indigenous Land Use Agreements (ILUAS) have been finalised. In the Murray, there is one agreement on part of a TSR being declared an Aboriginal place under the NPWS Act, and one agreement in Riverina with the Tumut-Brungle LALC to access 5 TSRs for engagement activities such as cultural burning.

Question 25 (Page 38)

The CHAIR: I appreciate that. I go to an issue that was further ventilated through an SO 52 on aerial shooting at Adaminaby. This was in June 2021. An LLS aerial shooter shot a sambar stag and then landed to remove the antlers and skin for his own personal use, which goes against procedures. To your knowledge, Minister—maybe with the help of Mr Orr—this is not an isolated incident, is it? This is something that happens quite regularly.

Mr DUGALD SAUNDERS: I might refer that to Mr Orr. I am not aware of the circumstance.

STEVE ORR: I am aware of that one particular issue. I am not aware of any other issues which are like that. If you have got any further information which is of that ilk, I am happy to consider that.

The CHAIR: With this particular incident, was any disciplinary action taken against that employee and when did that disciplinary action take place? Did it take being aired in Parliament for you to take action? That is what I am trying to get to.

STEVE ORR: Again, this is week five for me in this role. I will take that on notice and come back to you this afternoon.

ANSWER

Pest animals were destroyed near Adaminaby in June 2021 as part of an approved aerial shooting program, this included sampling for scientific purposes and collection of the head for educational purposes. There was no disciplinary action taken as this was part of an approved program.

Question 26 (Page 39)

The CHAIR: This will probably go to your department, because obviously a lot of this work was done before your time. What steps were taken to engage non-English speaking fishers in this marine park network plan? It is 160 pages long. For a normal English-speaking person, let me tell you it was a chore to get through. How have you engaged non-English-speaking fishermen, who might have trouble reading, writing and speaking English, in this process? They are a significant proportion of the recreational fishing sector?

Mr DUGALD SAUNDERS: Thanks, Chair. I might ask Sean to make a comment on that.

SEAN SLOAN: I will have to take that on notice and come back to you with a correct answer on that.

ANSWER

Please note that the answer is provided on p. 82 of the transcript by Mr Sloan:
"*There was a question around how we did the consultation on marine parks and was it available to people with a non-English-speaking background? The answer is yes, it was available through a translation service on the website. So when you went to the website, you could select between 100 different languages. Through the Have Your Say website, we also have an arrangement with the Department of Home Affairs where people can select to be put in touch with a translating service, where they can talk to somebody, ask questions and go through that process. We also ran a series of videos that were more visual to try to assist with that process as well. We had a couple of public webinars. They were in English, but we also have a question and answer that can be translated as well.*"

Question 27 (Page 39)

Mr DAVID SHOEBRIDGE: I will show you this document. Minister, that is the outcome of investigation, and enforcement and penalty notice to Forestry Corporation for $16,500 in penalties for illegal logging that went on over two years in Boyne State Forest, Bodalla State Forest and Mogo State Forest. How is it that Forestry Corporation conducted illegal logging activities for more than two years? How does that happen?

Mr DUGALD SAUNDERS: As I said, I have been in the role for 84 days, Mr Shoebridge. I think Anshul might be prepared to comment on that.

ANSHUL CHAUDHARY: I am happy to comment on that. The incidents actually occurred in 2017 and 2018. They did not carry on, Mr Shoebridge, for over two years. They were isolated incidents.

Mr DAVID SHOEBRIDGE: And 2019.

ANSHUL CHAUDHARY: It was 2017 and 2018.

Mr DAVID SHOEBRIDGE: No, sorry, Mr Chaudhary. The penalty notice states "conducting an investigation in relation to forestry operations". The commencement date is 20 September 2017 and the last date is 9 November 2019. It is over two years. It may be an uncomfortable truth for you, but that is the fact.

ANSHUL CHAUDHARY: I am happy to look into the detail for you.

ANSWER

If the document referred to is EPA reference 3173530077, the outcome of this investigation was to issue two Penalty Infringement Notices related to Bodalla State Forest and Boyne State Forest related to the inclusion of Swift Parrot records in harvest plans. The penalties relate to specific dates, being 11 May 2018 and 31 July 2017.

There is an accepted process of reliable records that have been validated by the scientific community being recorded in NSW BioNet flora and fauna database, the official species record system of the Department of Planning and Environment. When operations in Bodalla and Boyne State Forest were being planned, there were no records of the Swift Parrot in BioNet.

The PINs related only to inclusion of information in the harvest plan and not to operations in the forest. Forestry Corporation in fact retained more than ten times the required number of suitable feed trees for Swift Parrots within these operations.

Question 28 (Page 48)

The CHAIR: Before going on to crossbench members, I want to talk about compliance in marine parks, Mr Hansen. In the past five years how many people have been caught fishing illegally in a marine park?

SCOTT HANSEN: I would have to see if Mr Sloan has that information in front of him. If not, we can come back to you later in the afternoon. I will have to take it on notice.

The CHAIR: While you are doing that can we get a breakdown of the marine parks in which those offences occurred and what those offences were?

SEAN SLOAN: Yes

ANSWER

Marine Park/Fisheries Legislation	Count of Offenders
Batemans Marine Park	**808**
Section 41 Harm or attempt to harm any animal in sanctuary zone MEMA2014	313
Clause 1.25(2A) Possess prohibited equipment to take animal/plant MEM(MR)R1999	72
Section 34J(2) Fail to have official receipt in immediate possession FMA1994	59
Section 16(1) Possess prohibited size fish - first offence FMA1994	59
Section 34J(1) Recreational fisher fails to pay fishing fee FMA1994	51
Clause 1.25(2) Possess equipment for taking prohibited animal/plant MEM(MR)R1999	36
Clause 1.17(2)(b) Take etc fish in habitat protection zone breach rules MEM(MR)R1999	31
Section 18(2) Possess more than possession limit - first offence FMA1994	18
Section 18(2A) Possess more than possession limit - aggravated - first offence FMA1994	14
Clause 1.22(1)(a) Harm/attempt to harm any animal in special purpose zone MEM(MR)R1999	9
Section 17(2) Take more fish than daily limit - first offence FMA1994	8
Clause 1.25(1) Possess animal/plant taken in contravention of Regulation MEM(MR)R1999	8
Section 21B(1) Traffic in indictable fish species FMA1994	8

Clause 52(1)(b) Use spear gun to take fish in Schedule 4 waters FM(G)R2019	8
Clause 94(1) Shuck or possess shucked abalone - not commercial fisher FM(G)R2010	7
Section 41 Take etc any protected fish or plant in marine park MEMA2014	6
Section 41 Contravene management regulations - serious offence MEMA2014	5
Section 24(1) Unlawfully use net or trap for taking fish - first offence FMA1994	5
Clause 1.29(1)(a) Bring domesticated animal into marine park without consent MEM(MR)R1999	5
Section 41 Harm or attempt to harm any plant in sanctuary zone MEMA2014	4
Clause 9(1)(c) Possess/control/have charge of animal in park or on road in park NPWR2009	4
Section 258(2) Fail to comply with requirement to provide information FMA1994	4
Section 247(1) Resist/obstruct fisheries officer in the exercising function FMA1994	4
Section 16(2) Possess prohibited size fish - aggravated- first offence FMA1994	4
Clause 1.23(1) Take etc fish in special purpose zone breach management rule MEM(MR)R1999	4
Clause 1.16(1)(c) Damage/take/interfere with habitat in habitat protection zone MEM(MR)R1999	4
Section 18(2A) Possess more than possession limit - aggravated - prior offence FMA1994	3
Clause 95(3) Possess mutilated restricted species of fish FM(G)R2010	3
Clause 1.16(1)(a) Harm/attempt to harm animal in habitat protection zone MEM(MR)R1999	3
Clause 13(2) Contravene condition of permit MEMR2017	3
Section 35(1) Possess fish illegally taken - first offence FMA1994	3
Section 247(2) Abuse a fisheries officer FMA1994	3
Section 257(4) Fail to comply with section 257 requirement to produce authority FMA1994	3
Section 20A(3)(b) Take fish declared waters - recreational fishing - first offence FMA1994	3
Section 16(1) Possess prohibited size fish - prior offence FMA1994	3

Clause 96(1) Take/sell/possess crayfish/shovel-nosed lobster/rock lobster/crab carrying ova externally FM(G)R2010	2
Clause 95(1) Mutilate restricted species of fish FM(G)R2010	2
Clause 1.25(1A) Possess animal or plant prohibited by management rules MEM(MR)R1999	2
Section 279A(1) Master of boat not prevent serious fisheries offences FMA1994	2
Clause 50(1) Take fish by the method of jagging FM(G)R2019	2
Clause 91(1) Take/sell/possess crayfish/rock lobster etc carrying ova FM(G)R2019	2
Clause 1.16(1)(b) Harm/attempt to harm plant in habitat protection zone MEM(MR)R1999	2
Clause 1.22(1)(c) Damage/take/interfere with habitat in special purpose zone MEM(MR)R1999	2
Clause 1.32(1)(a) Sell/hire/attempt to sell/hire/expose for sale/hire/profit/solicit for sale article/thing/service MEM(MR)R1999	1
Section 41 Damage/take etc any part of habitat in sanctuary zone MEMA2014	1
Clause 225 Contravene condition of permit issued under Part 7 of Act FM(G)R2019	1
Clause 89(1) Mutilate restricted species of fish FM(G)R2019	1
Section 24(1) Unlawfully use net or trap for taking fish for sale - first offence FMA1994	1
Section 25(1)(a) Possess prohibited fishing gear - first offence FMA1994	1
Section 35(1) Possess fish for sale illegally taken - first offence FMA1994	1
Section 107A(1) Master use etc boat for declared commercial fishing boat activity not licensed to do so FMA1994	1
Clause 59(1) Place etc set net/trap not identified in accordance with Regulations FM(G)R2019	1
Clause 49(1) Take groper not use rod and line or handline FM(G)R2019	1
Section 24(1) Unlawfully use net or trap for taking fish - prior offence FMA1994	1
Section 200(1) Local government authority do reclamation work without permit FMA1994	1
Clause 87(1) Shuck or possess shucked intertidal invertebrate not as bait FM(G)R2019	1
Section 201(1) Carry out reclamation work without permit FMA1994	1

Section 16(2) Possess prohibited size fish - aggravated - prior offence FMA1994	1
Cape Byron Marine Park	**563**
Section 41 Harm or attempt to harm any animal in sanctuary zone MEMA2014	127
Section 34J(1) Recreational fisher fails to pay fishing fee FMA1994	88
Clause 1.35(2) Use/moor/anchor any vessel/vehicle/motorised equipment in contravention of the management rules MEM(MR)R1999	58
Clause 1.29(1)(a) Bring domesticated animal into marine park without consent MEM(MR)R1999	50
Clause 1.25(2A) Possess prohibited equipment to take animal/plant MEM(MR)R1999	48
Section 34J(2) Fail to have official receipt in immediate possession FMA1994	32
Section 25(1)(a) Possess prohibited fishing gear - first offence FMA1994	19
Clause 1.25(2) Possess equipment for taking prohibited animal/plant MEM(MR)R1999	16
Clause 1.16(1)(a) Harm/attempt to harm animal in habitat protection zone MEM(MR)R1999	16
Clause 1.22(1)(a) Harm/attempt to harm any animal in special purpose zone MEM(MR)R1999	8
Clause 13(2) Contravene condition of permit MEMR2017	5
Clause 1.17(2)(a) Take/attempt to take fish in marine park without permission MEM(MR)R1999	5
Clause 1.25(1) Possess animal/plant taken in contravention of Regulation MEM(MR)R1999	5
Section 41 Contravene management regulations - serious offence MEMA2014	5
Section 16(1) Possess prohibited size fish - first offence FMA1994	4
Clause 1.32(1)(b) Conduct/assist in the conduct of amusement/entertainment/performance/activity for money/other MEM(MR)R1999	4
Clause 1.17(2)(b) Take etc fish in habitat protection zone breach rules MEM(MR)R1999	4
Clause 59(1) Place etc set net/trap not identified in accordance with Regulations FM(G)R2019	4
Section 201(1) Carry out reclamation work without permit FMA1994	3

Section 24(1) Unlawfully use net or trap for taking fish for sale - first offence FMA1994	3
Section 205(2) Harm protected marine vegetation without obtaining permit FMA1994	3
Clause 1.14(1) Anchor/moor vessel in sanctuary zone not in designated area MEM(MR)R1999	3
Section 247(1) Resist/obstruct fisheries officer in the exercising function FMA1994	3
Section 201(1) Carry out dredging work without a permit FMA1994	3
Clause 1.22(1)(c) Damage/take/interfere with habitat in special purpose zone MEM(MR)R1999	3
Clause 1.26(2) Contravene conditions of use displayed on mooring MEM(MR)R1999	2
Clause 1.37 Clean fish etc in contravention of management rules MEM(MR)R1999	2
Clause 13(2) Contravene any condition of a permit MEMR2009	2
Clause 1.16(1)(c) Damage/take/interfere with habitat in habitat protection zone MEM(MR)R1999	2
Section 258(2) Fail to comply with requirement to provide information FMA1994	2
Clause 1.34(1)(b) Organise/conduct concert/public meeting/event/demonstration/similar gathering MEM(MR)R1999	2
Clause 63(2) Vessel operator enter caution zone of calf NPWR2009	2
Section 56(1)(e) Be accompanied by a dog in a nature reserve NPWA1974	2
Clause 1.38(1)(a) Unlawfully camp in marine park MEM(MR)R1999	2
Clause 45(1) Place/set net/fishing gear not identified in accordance with Regulation FM(G)R2010	2
Clause 1.36(1) Feed fish in marine park without consent/permission MEM(MR)R1999	1
Section 41 Harm or attempt to harm any plant in sanctuary zone MEMA2014	1
Clause 89(1) Mutilate restricted species of fish FM(G)R2019	1
Clause 1.23(1) Take etc fish in special purpose zone breach management rule MEM(MR)R1999	1
Clause 53(1) Take fish by the method of jagging FM(G)R2010	1
Section 14(2) Possess fish taken in breach fishing closure - first offence FMA1994	1

Clause 1.29(1A) Not remove domestic animal faeces from marine park MEM(MR)R1999	1
Section 145 Deposit litter PEOA 1997	1
Clause 95(1) Mutilate restricted species of fish FM(G)R2010	1
Clause 1.33(a) Photograph/film/video using marine park structures MEM(MR)R1999	1
Clause 1.29(1)(b) Leave domesticated animal unattended in marine park MEM(MR)R1999	1
Section 16(1) Possess prohibited size fish - prior offence FMA1994	1
Section 257(4) Fail to comply with section 257 requirement to produce authority FMA1994	1
Clause 1.34(1)(a) Organise/conduct sporting competition/tournament MEM(MR)R1999	1
Section 288D(1) Makes\provides false\misleading information FMA1994	1
Clause 4(2)(a) Enter park/part of park closed to public NPWR2009	1
Clause 86(3) Remove pipis from an authorised area FM(G)R2019	1
Clause 1.25(1A) Possess animal or plant prohibited by management rules MEM(MR)R1999	1
Section 41 Damage/take etc any part of habitat in sanctuary zone MEMA2014	1
Section 20A(3)(b) Take fish declared waters - recreational fishing - first offence FMA1994	1
Section 24(1) Unlawfully use net or trap for taking fish - first offence FMA1994	1
Section 68(3)(b) Give etc false or misleading information/evidence etc MEMA2014	1
Clause 49(1) Take groper not use rod and line or handline FM(G)R2019	1
Clause 52(1) Take groper not use rod and line or handline FM(G)R2010	1
Jervis Bay Marine Park	**900**
Section 41 Harm or attempt to harm any animal in sanctuary zone MEMA2014	347
Section 34J(1) Recreational fisher fails to pay fishing fee FMA1994	212
Section 16(1) Possess prohibited size fish - first offence FMA1994	112
Section 34J(2) Fail to have official receipt in immediate possession FMA1994	43

Section 18(2) Possess more than possession limit - first offence FMA1994	34
Clause 1.35(2) Use/moor/anchor any vessel/vehicle/motorised equipment in contravention of the management rules MEM(MR)R1999	29
Clause 1.17(2)(b) Take etc fish in habitat protection zone breach rules MEM(MR)R1999	16
Clause 1.14(1) Anchor/moor vessel in sanctuary zone not in designated area MEM(MR)R1999	11
Clause 91(1) Take/sell/possess crayfish/rock lobster etc carrying ova FM(G)R2019	11
Section 17(2) Take more fish than daily limit - first offence FMA1994	7
Clause 95(3) Possess mutilated restricted species of fish FM(G)R2010	7
Clause 89(3) Possess restricted species mutilated in prohibited manner FM(G)R2019	7
Clause 1.25(1A) Possess animal or plant prohibited by management rules MEM(MR)R1999	5
Clause 1.11(1) Harm/attempt to harm any animal/plant, damage take/interfere with habitat in sanctuary zone MEM(MR)R1999	5
Clause 49(1) Take nippers/beachworms/squirt worm/blood worms/pipis other than as prescribed FM(G)R2010	4
Clause 95(1) Mutilate restricted species of fish FM(G)R2010	4
Clause 1.25(2A) Possess prohibited equipment to take animal/plant MEM(MR)R1999	4
Clause 87(2) Shuck or possess shucked rock lobster/turban snail etc FM(G)R2019	3
Section 16(1) Possess prohibited size fish - prior offence FMA1994	3
Clause 1.16(1)(a) Harm/attempt to harm animal in habitat protection zone MEM(MR)R1999	3
Clause 1.25(2) Possess equipment for taking prohibited animal/plant MEM(MR)R1999	3
Clause 13(2) Contravene condition of permit MEMR2017	3
Clause 89(1) Mutilate restricted species of fish FM(G)R2019	2
Clause 1.34(1)(a) Organise/conduct sporting competition/tournament MEM(MR)R1999	2
Clause 46(1) Take saltwater nippers/worms etc other than as prescribed FM(G)R2019	2
Clause 87(1) Shuck or possess shucked intertidal invertebrate not as bait FM(G)R2019	2

Clause 1.22(1)(c) Damage/take/interfere with habitat in special purpose zone MEM(MR)R1999	2
Section 41 Harm or attempt to harm any plant in sanctuary zone MEMA2014	2
Section 25(1)(a) Possess prohibited fishing gear - first offence FMA1994	1
Clause 43(1)(a) Use more than 4 hand held lines FM(G)R2019	1
Section 258(2) Fail to comply with requirement to provide information FMA1994	1
Clause 1.23(1) Take etc fish in special purpose zone breach management rule MEM(MR)R1999	1
Clause 1.25(1) Possess animal/plant taken in contravention of Regulation MEM(MR)R1999	1
Clause 96(1) Take/sell/possess crayfish/shovel-nosed lobster/rocklobster/crab carrying ova externally FM(G)R2010	1
Section 257(4) Fail to comply with section 257 requirement to produce authority FMA1994	1
Clause 48(1) Take rocklobster other than by hand picking FM(G)R2010	1
Section 288D(1) Makes\provides false\misleading information FMA1994	1
Section 19(3) Possess protected fish - first offence FMA1994	1
Clause 1.32(1)(b) Conduct/assist in the conduct of amusement/entertainment/performance/activity for money/other MEM(MR)R1999	1
Section 24(1) Unlawfully use net or trap for taking fish - first offence FMA1994	1
Section 247(2) Abuse a fisheries officer FMA1994	1
Section 127B(2) Use of unlicensed charter fishing boat FMA1994	1
Section 127B(3) Permit use of unlicensed chartered fishing boat FMA1994	1
Port Stephens - Great Lakes Marine Park	**1364**
Section 41 Harm or attempt to harm any animal in sanctuary zone MEMA2014	516
Clause 1.25(2) Possess equipment for taking prohibited animal/plant MEM(MR)R1999	186
Section 34J(1) Recreational fisher fails to pay fishing fee FMA1994	163
Section 34J(2) Fail to have official receipt in immediate possession FMA1994	117
Section 16(1) Possess prohibited size fish - first offence FMA1994	62

Clause 1.17(2)(b) Take etc fish in habitat protection zone breach rules MEM(MR)R1999	41
Section 18(2) Possess more than possession limit - first offence FMA1994	26
Section 25(1)(a) Possess prohibited fishing gear - first offence FMA1994	19
Clause 1.25(1A) Possess animal or plant prohibited by management rules MEM(MR)R1999	17
Section 24(1) Unlawfully use net or trap for taking fish for sale - first offence FMA1994	14
Section 24(1) Unlawfully use net or trap for taking fish - first offence FMA1994	10
Section 257(4) Fail to comply with section 257 requirement to produce authority FMA1994	10
Clause 87(1) Shuck or possess shucked intertidal invertebrate not as bait FM(G)R2019	9
Section 41 Harm or attempt to harm any plant in sanctuary zone MEMA2014	9
Clause 59(1) Place etc set net/trap not identified in accordance with Regulations FM(G)R2019	9
Clause 45(1) Place/set net/fishing gear not identified in accordance with Regulation FM(G)R2010	9
Clause 55(4) Not mark boundaries of leased area for duration of lease FM(A)R2017	8
Clause 1.35(2) Use/moor/anchor any vessel/vehicle/motorised equipment in contravention of the management rules MEM(MR)R1999	8
Section 201(1) Carry out reclamation work without permit FMA1994	8
Section 41 Contravene management regulations - serious offence MEMA2014	7
Section 279A(1) Master of boat not prevent serious fisheries offences FMA1994	7
Section 17(2) Take more fish than daily limit - first offence FMA1994	6
Section 14(1) Contravene fishing closure take fish - first offence FMA1994	6
Clause 1.25(2A) Possess prohibited equipment to take animal/plant MEM(MR)R1999	5
Section 124A(5) Commercial Fisher fail to make real time report - first offence FMA1994	4
Section 205(2) Harm protected marine vegetation without obtaining permit FMA1994	4

Section 171(3B) Fail to comply with notice under section 171 FMA1994	4
Section 258(2) Fail to comply with requirement to provide information FMA1994	4
Clause 53(1) Take fish by the method of jagging FM(G)R2010	4
Section 24(1) Unlawfully use net or trap for taking fish for sale - prior offence FMA1994	4
Clause 49(1) Take groper not use rod and line or handline FM(G)R2019	3
Section 201(1) Carry out dredging work without a permit FMA1994	3
Section 35(1) Possess fish illegally taken - first offence FMA1994	3
Clause 1.11(1) Harm/attempt to harm any animal/plant, damagetake/interfere with habitat in sanctuary zone MEM(MR)R1999	3
Section 25(1)(a) Possess prohibited fishing gear fish taken for sale - first offence FMA1994	3
Clause 93(1) Shuck/possess shucked intertidal invertebrate not as bait FM(G)R2010	2
Clause 99 Contravene condition of approval granted under section 37 of Act FM(G)R2010	2
Section 35(1) Possess fish for sale illegally taken - prior offence FMA1994	2
Section 247(1) Resist/obstruct fisheries officer in the exercising function FMA1994	2
Clause 13(2) Contravene condition of permit MEMR2017	2
Clause 75(1) Interfere with any set fishing gear without reasonable excuse FM(G)R2019	2
Clause 93(2) Shuck/possess shucked rocklobster/turban snail FM(G)R2010	2
Section 145 Deposit litter PEOA 1997	2
Clause 1.29(1)(a) Bring domesticated animal into marine park without consent MEM(MR)R1999	2
Clause 43(3) Leave unidentified hand held line unattended FM(G)R2019	2
Section 41 Damage/take etc any part of habitat in sanctuary zone MEMA2014	2
Clause 1.16(1)(c) Damage/take/interfere with habitat in habitat protection zone MEM(MR)R1999	2
Clause 87(2) Shuck or possess shucked rock lobster/turban snail etc FM(G)R2019	2

Clause 1.16(1)(a) Harm/attempt to harm animal in habitat protection zone MEM(MR)R1999	2
Section 68(6C) Contravene condition of endorsement on licence - first offence FMA1994	2
Clause 45(1) Take rock lobster other than by hand picking FM(G)R2019	1
Clause 1.34(1)(a) Organise/conduct sporting competition/tournament MEM(MR)R1999	1
Clause 50(1) Take fish by the method of jagging FM(G)R2019	1
Section 219(1)(c) Create obstruction across/within bay/inlet/river/creek FMA1994	1
Clause 1.25(1) Possess animal/plant taken in contravention of Regulation MEM(MR)R1999	1
Section 219(1)(a) Set net/netting/other material across/within bay/inlet/river/creek FMA1994	1
Clause 89(1) Mutilate restricted species of fish FM(G)R2019	1
Clause 52(1)(c) Use spear gun aided by lights to take fish in any waters FM(G)R2019	1
Clause 98 Contravene condition of approval granted under section 37 of the Act FM(G)R2019	1
Section 102(1) Take fish for sale authorisation not appropriate - first offence FMA1994	1
Clause 66(1) Interfere with any set fishing gear FM(G)R2010	1
Section 65(1) Shareholder/nominee contravenes provision of management plan FMA1994	1
Section 35(1) Possess fish for sale illegally taken - first offence FMA1994	1
Clause 1.32(1)(a) Sell/hire/attempt to sell/hire/expose for sale/hire/profit/solicit for sale article/thing/service MEM(MR)R1999	1
Clause 1.36(1) Feed fish in marine park without consent/permission MEM(MR)R1999	1
Clause 43(1)(b) Use hand line with more than 3 hooks/3 gangs of hooks/3 treble hooks FM(G)R2019	1
Section 18(2) Possess more than possession limit - prior offence FMA1994	1
Section 124A(5) Commercial Fisher fail to make real time report - prior offence FMA1994	1
Clause 52(1) Take groper not use rod and line or handline FM(G)R2010	1
Section 124A(5)(a) Commercial Fisher fail to make real time report as prescribed - first offence FMA1994	1
Section 124B Provide false\misleading information FMA1994	1

Section 104(7) Contravene condition of commercial fishing licence FMA1994	1
Section 121(4) Commercial fisher fail to make record as prescribed FMA1994	1
Solitary Islands Marine Park	**1132**
Section 34J(1) Recreational fisher fails to pay fishing fee FMA1994	203
Section 16(1) Possess prohibited size fish - first offence FMA1994	148
Section 41 Harm or attempt to harm any animal in sanctuary zone MEMA2014	141
Section 34J(2) Fail to have official receipt in immediate possession FMA1994	103
Clause 1.25(1) Possess animal/plant taken in contravention of Regulation MEM(MR)R1999	78
Clause 1.25(2A) Possess prohibited equipment to take animal/plant MEM(MR)R1999	69
Section 24(1) Unlawfully use net or trap for taking fish - first offence FMA1994	53
Section 18(2) Possess more than possession limit - first offence FMA1994	45
Clause 1.25(2) Possess equipment for taking prohibited animal/plant MEM(MR)R1999	34
Section 35(1) Possess fish illegally taken - first offence FMA1994	33
Clause 1.25(1A) Possess animal or plant prohibited by management rules MEM(MR)R1999	28
Clause 1.14(1) Anchor/moor vessel in sanctuary zone not in designated area MEM(MR)R1999	19
Section 25(1)(a) Possess prohibited fishing gear - first offence FMA1994	16
Clause 1.11(1) Harm/attempt to harm any animal/plant, damagetake/interfere with habitat in sanctuary zone MEM(MR)R1999	13
Section 41 Harm or attempt to harm any plant in sanctuary zone MEMA2014	10
Clause 12.35 Take fish in commonwealth marine reserve EP&BCR2000	9
Section 35(1) Possess fish for sale illegally taken - first offence FMA1994	8
Section 24(1) Unlawfully use net or trap for taking fish for sale - first offence FMA1994	7

Clause 45(1) Place/set net/fishing gear not identified in accordance with Regulation FM(G)R2010	7
Clause 55(1)(c) Use spear gun aided by lights to take fish FM(G)R2010	6
Section 62(2) Possess animal etc taken in contravention of notification MEMA2014	6
Section 279A(1) Master of boat not prevent serious fisheries offences FMA1994	5
Clause 1.16(1)(a) Harm/attempt to harm animal in habitat protection zone MEM(MR)R1999	5
Clause 12.56(2) Use recreational fishing vessel in commonwealth marine reserve with fishing equipment not stowed and secured EP&BCR2000	5
Section 16(1) Possess prohibited size fish - prior offence FMA1994	5
Clause 1.23(1) Take etc fish in special purpose zone breach management rule MEM(MR)R1999	4
Clause 59(1) Place etc set net/trap not identified in accordance with Regulations FM(G)R2019	4
Section 14(1) Contravene fishing closure take fish - first offence FMA1994	4
Section 25(1)(a) Possess prohibited fishing gear fish taken for sale - first offence FMA1994	3
Clause 1.15 Fish/attempt to fish from moorings in sanctuary zone MEM(MR)R1999	3
Clause 1.35(2) Use/moor/anchor any vessel/vehicle/motorised equipment in contravention of the management rules MEM(MR)R1999	3
Clause 1.17(2)(b) Take etc fish in habitat protection zone breach rules MEM(MR)R1999	3
Clause 75(1) Interfere with any set fishing gear without reasonable excuse FM(G)R2019	2
Clause 52(1)(c) Use spear gun aided by lights to take fish in any waters FM(G)R2019	2
Clause 87(1) Shuck or possess shucked intertidal invertebrate not as bait FM(G)R2019	2
Clause 45(1) Take rock lobster other than by hand picking FM(G)R2019	2
Clause 12.56(1) Use fishing vessel in commonwealth marine reserve EP&BCR2000	2
Clause 91(1) Take octopus from rock platform in prescribed waters FM(G)R2010	2

Section 19(2) Take protected fish for sale - first offence FMA1994	2
Clause 95(3) Possess mutilated restricted species of fish FM(G)R2010	2
Section 247(1) Resist/obstruct fisheries officer in the exercising function FMA1994	2
Section 102(1) Take fish for sale authorisation not appropriate - first offence FMA1994	2
Clause 12.23(1) Enter commonwealth marine reserve in contravention of a prohibition/restriction EP&BCR2000	2
Section 102(1) Take fish for sale no commercial fishing licence - first offence FMA1994	2
Clause 1.16(1)(c) Damage/take/interfere with habitat in habitat protection zone MEM(MR)R1999	2
Section 17(2) Take more fish than daily limit - first offence FMA1994	2
Clause 1.22(1)(a) Harm/attempt to harm any animal in special purpose zone MEM(MR)R1999	2
Clause 85(1) Take octopus from rock platform in prescribed waters FM(G)R2019	2
Clause 1.17(2)(a) Take/attempt to take fish in marine park without permission MEM(MR)R1999	1
Section 18(2A) Possess more than possession limit - aggravated - first offence FMA1994	1
Section 25(1)(b) Possess fishing gear in prohibited waters - first offence FMA1994	1
Clause 48(1) Take rocklobster other than by hand picking FM(G)R2010	1
Clause 66(1) Interfere with any set fishing gear FM(G)R2010	1
Clause 49(1) Take groper not use rod and line or handline FM(G)R2019	1
Clause 1.26(2) Contravene conditions of use displayed on mooring MEM(MR)R1999	1
Section 24(1) Unlawfully use net or trap for taking fish - prior offence FMA1994	1
Section 258(2) Fail to comply with requirement to provide information FMA1994	1
Clause 52(1) Take groper not use rod and line or handline FM(G)R2010	1
Section 19(2) Take protected fish - first offence FMA1994	1
Section 16(2) Possess prohibited size fish - aggravated- first offence FMA1994	1

Clause 46(1)(b) Hand held line more than 3 hooks/3 gangs of hooks/3 treble hooks FM(G)R2010	1
Section 247(2) Threaten fisheries officer FMA1994	1
Section 41 Contravene management regulations - serious offence MEMA2014	1
Section 107A(1) Master use etc boat for declared commercial fishing boat activity not licensed to do so FMA1994	1
Clause 46(1)(a) Use more than 4 hand held lines FM(G)R2010	1
Section 19(3) Possess protected fish for sale - first offence FMA1994	1
Section 220ZB(1) Buy/sell/possess fish/vegetation of an vulnerable species FMA1994	1
Clause 89(1) Mutilate restricted species of fish FM(G)R2019	1
Grand Total	**4767**

Legend

EP&BCR2000 - Environment Protection and Biodiversity Conservation Regulations 2000
FM(A)R2017 - Fisheries Management (Aquaculture) Regulation 2017
FM(G)R2010 - Fisheries Management (General) Regulation 2010
FM(G)R2019 - Fisheries Management (General) Regulation 2019
FMA1994 - Fisheries Management Act 1994
MEM(MR)R1999 - Marine Estate Management (Management Rules) Regulation 1999
MEMA2014 - Marine Estate Management Act 2014
MEMR2009 - Marine Estate Management Regulation 2009
MEMR2017 - Marine Estate Management Regulation 2017
NPWA1974 - National Parks and Wildlife Act 1974
NPWR2009 - National Parks and Wildlife Regulation 2009
PEOA 1997 - Protection of the Environment Operations Act 1997

Question 29 (Page 49)

The CHAIR: I am just trying to clarify it because you said that sometimes body cameras would be used, but not always. I want to try to get a baseline of the bare minimum recording of interactions you would expect from them?

SEAN SLOAN: Specifically, the use of body-worn cameras, obviously we would not want to be collecting footage 100 per cent of the time because we have got to review that footage. It has got a purpose. So generally speaking the footage is collected when we are having more high-risk encounters. That is a generalisation but that is how that technology is used.

SCOTT HANSEN: The number of section 41s, which are harm or attempt to harm any animal in a sanctuary zone, in 2021 that was 174 penalty notices issued on that, and taking fish in declared waters there were 91 of those—that is, recreational fishing.

The CHAIR: That was in 2021?

SCOTT HANSEN: Yes.

The CHAIR: I asked you to go back further than five years. So could you provide that on notice?

SCOTT HANSEN: Okay, we will go back to before then.

The CHAIR: Perhaps also on notice, how many of those who have been caught fishing within a marine park sanctuary zone have been prosecuted? And of those that have been prosecuted, how many times has the maximum penalty been applied for that particular offence?

SCOTT HANSEN: I will have to take that on notice.

The CHAIR: Sure. To your knowledge, Mr Hansen, in the last five years, if it has gone to prosecution or it has not, has the magistrate or DPI Fisheries shown leniency towards a perpetrator based on their defence, and what would be the guiding standards set of parameters that would allow them to do that, particularly the DPI Fisheries—not the magistrate, because you do not have control, or the magistrate does, but in terms of DPI Fisheries?

SCOTT HANSEN: I am actually struggling to think of any court prosecutions for recreational fishing in a marine park. The vast majority issued penalty infringement notices.

The CHAIR: In the Act it says that it can go before a Local Court or the Land and Environment Court.

SCOTT HANSEN: I would have to take that on notice because I cannot think of too many cases that have ended up there.

ANSWER

Body Worn Camera Question answered by Sean Sloan in the hearing.

Table of the number of people caught illegally fishing in a Marine Park broken down by offence and each Marine Park provided in the answer above to Question 28.

A total of 42 offenders have been prosecuted for offences involving fishing within a Marine Park sanctuary zone over the last 5 years. None of these offenders got the maximum penalty.

Fisheries Officers follow strict Compliance Response Matrices that set the appropriate sanction for each offence based on its severity, any antecedence for the offender and any other mitigating circumstances.

We are unable to comment on the processes of the courts or procedures applied by magistrates in determining matters.

Question 30 (Page 50)

The Hon. EMMA HURST: And what is that ARRP approval process to the Minister's office?

KIM FILMER: Up through the department.

The Hon. EMMA HURST: So who does it go through? Once ARRP has approved it, who does it go to then?

KIM FILMER: It goes up through the approval chain.

SCOTT HANSEN: It goes through to John and then to myself and then through to the Minister.

KIM FILMER: That is it.

The Hon. EMMA HURST: Mr Hansen and Dr Tracey, is that finalised from your department, from the DPI, or has that still not reached the Minister yet from the 2020 statistics?

SCOTT HANSEN: I cannot recall seeing them myself yet. So I would have to take that on notice as to where they are in our system.

ANSWER

The NSW 2020 Animal Use in Research statistics report has been published and is available at: https://www.animalethics.org.au/animal-use-statistics

Question 31 (Page 51)

Mr JUSTIN FIELD: Thank you, Chair. Thank you all for being here this afternoon. I would not mind starting on marine, if I could, probably to you, Mr Sloan, in the first instance, or Mr Hansen. Have there been any changes made to the management rules around Fish Rock and Green Island in terms of the use of baited hooks around those sites?

SEAN SLOAN: Thanks for the question. There has been an amendment to a temporary order recently that related to—and I think I will need to take it on notice to give you the correct answer—but there was an administrative error in a notice that was corrected recently, related to leaded line, the technique of leaded-line fishing, and we corrected that recently. So it was largely an administrative error that was corrected.

Mr JUSTIN FIELD: You mean weighted lines that can be used while underway, is that what you are talking about? You can use baited hooks on a leaded line, can you?

SEAN SLOAN: That is correct, and it is a specific method that is used. But there was an order that was put in place that had an inadvertent outcome that was corrected. So that was something that was recent. But I will need to take it on notice to give you the correct answer.

Mr JUSTIN FIELD: I would appreciate it if you could find out before the end of today, if at all possible, Mr Sloan. On the department's website the recreational and spearfishing management plan site for fishing and diving rules at grey nurse shark aggregation sites it says for both those sites that line fishing using bait is prohibited, full stop. But I have been told that pro fishers have been told by compliance officers that the use of baited lead lines, as long as they are underway at Fish Rock and Green Island, is now allowed. That does not seem to be how it is described on your website. If you could explain those changes, and if it is the case—I mean, this is new though, right? That has not been allowed there before.

SEAN SLOAN: To that gear method, I think it is not a new method. It has been around for a long time.

Mr JUSTIN FIELD: That has not been allowed at those sites before, has it? Certainly, it was not up until this change.

SEAN SLOAN: Let met look into it and get you the correct answer, just to make sure that I can give you—

Mr JUSTIN FIELD: That would be great, and if there was any form of risk assessment done before those changes were made and if it was subject to public consultation and the date of the change, if possible?

SEAN SLOAN: My understanding is that there was an administrative error in a recent rule, but that is something we will check and come back to you.

SCOTT HANSEN: We will come back to you with some of the details about when that happened and what the details around it were.

Mr JUSTIN FIELD: It seems substantial, though. It is hardly an administrative error if all of a sudden a new practice of fishing can occur that previously was not allowed.

SCOTT HANSEN: We will come back and check how substantive it is or whether this was just correcting an omission in something that was drafted three months ago. They are the either ends of the spectrum, I would say. We will come back and see what it looks like.

ANSWER

The question relates to Ocean Trap and Line Fishery closures for North and South Solitary Islands, Fish Rock, Green Island, and Magic Point.

A correction was made in 2021 to correct the definition of lead lining so that a hand held line where weights may be placed on the line and one hook or a gang of hooks with bait (dead or alive) may be used by commercial fishers.

The new closure **did not intend to change the rules**.

Recreational fishers are not allowed to used bait lines in side of Grey Nurse Critical habitat (200m), can only use soft plastics or lures.

This closure is re-made every 5 years as per legislative requirements.

During the closure being remade in 2020, when no change to the rules were intended, a definition of 'trolling' was included in the closure, which inadvertently restricted the use of weighted lines from vessels under power – a technique that had been used since 2008.

The new closure introduced in 2020 **did not intend to change the rules**. The inclusion of 'lead lining' inadvertently caused the method of using bait on lead lines to be illegal. The amended closure in 2021 corrected this and returned the arrangements to what they have been since 2008.

The fishing closure was first established in 2008 implementing restrictions on line fishing to mitigate the impact of commercial fishing on Greynurse Sharks and to meet Commonwealth export approval conditions.

The Greynurse Shark is listed as critically endangered in the *Fisheries Management Act 1994* (FM Act). The east coast population of Greynurse Shark is also listed as critically endangered under the Commonwealth *Environment Protection and Biodiversity Conservation Act 1999*.

Question 32 (Page 53)

The Hon. MICK VEITCH: The Food Authority is predominantly the entity that is working with the councils. Is that correct?

SCOTT HANSEN: That is correct.

The Hon. MICK VEITCH: If the program is successful and we want to promote it, you would want to know why some councils are not opting into it. If I could I would like to get to the bottom of that. If you can take that on notice and see if that work has been done to determine why councils are not coming on board and get that information back to the Committee, not by the end of the day but as part of an on notice arrangement, that would be very good. As I understand it, the Food Authority also undertakes inspections—this could be wrong—of aged-care facilities. They do food safety audits.

SCOTT HANSEN: Yes.

ANSWER

As of 30 June 2021, there were 61 local councils participating in the Scores on Doors program representing 63% of all eligible retail food businesses in NSW. Reasons for a Council not participating include administrative burden as it is a voluntary program, concern of having a negative impact on a low rating business, stretched resources, low local consumer awareness. The retail food service sector was highly impacted by COVID-19 restrictions, so Scores on Doors promotion was not given priority during the pandemic. The Food Authority is currently revamping the Scores on Doors material it provides to Councils to renew the voluntary scheme and drive further uptake as the sector recovers.

The NSW Food Authority currently licenses around 1,200 businesses that provide food service to vulnerable persons, which includes aged-care facilities. These businesses need to meet the requirements set out in the Food Regulation 2015 Vulnerable Persons Food Safety Scheme. During FY 2020-21, there were 1374 audits and inspections of businesses in this sector.

Question 33 (Page 53)

The Hon. MICK VEITCH: With regard to that particular pilot, has that been finalised?

STEVE ORR: I might take that one. I think that is more an LLS matter, Mr Veitch. I came across this issue last Thursday. What I have managed to understand is that $107,000 was provided to Monaro Farming Systems to develop guidelines with respect to the management. Money was provided for the preparation of guidelines for the management of grasslands in that area. I understand there was a contract for the provision of funding. The contract had some very clear milestones in terms of what was to be delivered. There is a final report and there was a signed off procurement strategy in relation to those funds.

The Hon. MICK VEITCH: Now that the works have been finalised, have there been any changes to the legal instruments around assessment of native grasslands, which will be the Monaro grasslands, arising from this work?

STEVE ORR: I am not familiar in terms of what happened next. In relation to the story, as I understand, there was a commitment to look at two pilot areas. One was the Monaro and the other was Walgett, and this was part of the Monaro piece. But in terms of where that work actually led, I do not have an answer. I could come back to you, Mr Veitch.

The Hon. MICK VEITCH: There has been a body of work funded by the taxpayers of New South Wales.

STEVE ORR: Correct.

The Hon. MICK VEITCH: I think it is important that the taxpayers of New South Wales know what that body of work has delivered. You said there was a final report?

STEVE ORR: Correct.

The Hon. MICK VEITCH: Is that available?

STEVE ORR: I do not know where it is published. I came across it. Yes, there is a final report—

The Hon. MICK VEITCH: You might want to take it on notice.

STEVE ORR: In terms of whether it has been released publicly, I do not know.

The Hon. MICK VEITCH: Yes. I am happy for you to take it on notice and check.

STEVE ORR: Sure.

The Hon. MICK VEITCH: And then, if it is possible for that to be made available to the Committee, I would be very grateful.

STEVE ORR: Thanks.

ANSWER

Since the introduction of clause 19A in the Land Management (Native Vegetation) Code 2018, there have been no further regulatory changes in relation to the assessment of the Monaro Tableland Cool Temperate Grassy Woodland in the South Eastern Highlands Bioregion.

. **A copy of the final report is attached.**

Question 34 (Page 54)

The Hon. MICK VEITCH: When you talk about the advisory groups, the Riverina one has a range of public land managers. Forest Corp is on it, Mr Chaudhary. You also have NSW Farmers, Landcare, rural landholders, Roads and Maritime Services and the like. Are there any First Nations representatives on that advisory committee?

ROB KELLY: I would have to take that on notice. I certainly know they have been invited where they have public land that is required to be managed.

The Hon. MICK VEITCH: I am specifically thinking of the local Aboriginal land councils.

ROB KELLY: They have been invited. Whether they participate or not, I will have to take that on notice.

The Hon. MICK VEITCH: Can you take it on notice for each of them?

ROB KELLY: Sure.

ANSWER

Nine of the 11 Regions have extended invitations to Local Aboriginal Land Councils (LALCs) or First Nations Community Representatives. Four of the eleven LLS regions have representation/ participation from the First Nation Representatives or LALCs. Riverina previously had a First Nations Representative on the RWC but has since resigned.

Question 35 (Page 56)

The Hon. MICK VEITCH: It says in the New South Wales Weeds Action Program Guidelines 2020-2025 that the program is run in five-year rounds, the third round being July 2020-2025. Can someone provide me a list of recipients of the funding for weeds, how we have acquitted the dollars and that the original intent for those dollars has been achieved—that the reason we allocated the funds, if there is some sort of review that says we have met that?

JOHN TRACEY: I can point you to the Weeds Action Program report. We do report on this activity and, in that, it will have some really good stats in terms of the returns on investment. When you look at every dollar put into weed control, the focus for that program is exactly that—trying to get the best benefit out not only in terms of leverage for partners but also in terms of the maximum impact in the sort of work that is done there. Like I said, the focus is the front end of the invasion curve, which means you are getting 100-to-one returns in the sort of investments that we have got there. We are focusing on high-risk pathways. There are some really good programs in there also for weed biocontrol, which targets established weeds. The returns there are—some of the recent work there is more than a 60-to-one return on investment for some of the work that has been conducted. A lot of that is in those reports that we can provide you.

ANSWER

The NSW Weeds Action Program (WAP) helps fund new weed detections through inspections of properties and high risk pathways as well as compliance and regional planning. It also assists NSW DPI to undertake research or training to assist land managers with building awareness and capacity through new management tools and advice. Weed biological control research being a good example of this.

All WAP projects are reported annually and assessed by NSW DPI weeds biosecurity staff to ensure outputs and outcomes are achieved. For the 11 regional sub-programs, these are administered by each Local Land Services, who collate information from Local Control Authorities and other stakeholders on the weed activities under the Regional Strategic Weed Management Plans. This is assessed annually by NSW DPI to ensure key goals remain on target. Every five years, key activities and outcomes are then reported. The significant achievements of the 2015-2020 Program - which provided $57.6million to over 100 partner organisations over 5 years and attracted a co-investment of $108.2million - are captured in the report available on the DPI website at: https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0004/1290082/NSW-Weeds-Action-Program-Report-2015-2020.pdf.

Recipients of WAP funds –

PROJECT NAME	**2021-2022**	**2020-21**	**2015-2020**
Central Tablelands Weeds Action Program	965,826	965,826	4,282,129
Central West Weeds Action Program	931,210	931,210	4,106,388
Greater Sydney Weeds Action Program	1,097,763	1,097,763	5,587,261
Hunter Weeds Action Program	1,241,549	1,241,549	5,681,972
Murray Weeds Action Program	604,145	604,145	2,667,049
North Coast Weeds Action Program	1,534,644	1,534,644	7,164,551
North West Weeds Action Program	838,133	838,133	3,633,637
Northern Tablelands Weeds Action Program	730,609	730,609	3,147,097
Riverina Weeds Action Program	965,129	965,129	4,283,189
South East Weeds Action Program	1,703,989	1,703,989	8,029,768
Western Weeds Action Program	433,503	433,503	1,579,535
REGIONAL SUB-PROGRAM TOTAL	**11,046,500**	**11,046,500**	**50,162,576**
Crown Lands Public Reserves			201,580
New Weed Incursions Weeds Action Program		100,000	499,739
Secure Borders Weeds Action Program (Parthenium weed)		100,000	350,000

State Aquatic Weed Coordination		265,000	737,400
Tropical Soda Apple - Towards Eradication	191,932	126,000	402,000
Online weed risk assessment database			150,000
Biosecurity Intelligence Weeds Action Program		110,000	330,000
State Priority Weeds Coordination and Response	640,065		
Eradicating Hawkweed	113,590	180,000	1,021,324
Partnerships and State Programs	215,947	240,000	1,475,760
Enabling Voluntary Compliance – Capacity Building and Engagement	285,616	368,000	1,755,720
Developing the Biological Control Pipeline	166,350	127,000	539,000
STATE TOTAL	**1,613,500**	**1,616,000**	**7,462,523**
TOTAL	**12,660,000**	**12,662,500**	**57,625,099**

Question 36 (Page 58)

The CHAIR: Can we go to trust funds, Mr Hansen? Obviously over many years DPI has submitted applications to access trust fund money. In some of those applications it mentions the words "operational overheads". Can you explain what those overheads would comprise, generally speaking?

SCOTT HANSEN: I might ask Mr Sloan to talk to any details of that. But, giving him time to pull that information up, when we think about the majority of the projects that we have put our names forward for—things like the offshore reefs, the artificial reef program and so forth—the cost of building the reef is one thing but the costs of staff to manage the oversight of issuing the contracts, doing the expressions of interest, considering tenders and entering into contracts do not actually add to the structure of the reef. But if that is not done, you do not get a reef being built. They are the kinds of things that I assume are picked up in those descriptions of costs. But I will throw to Mr Sloan if there is anything in addition that he wants to add.

SEAN SLOAN: First of all, I just mention that we have recently published a Recreational Fishing Trusts annual report. It is the first report of its kind that we have published in New South Wales. It is available publicly on the website and provides all the detail of the expenditure of funds out of the Recreational Fishing Trusts. That is publicly available. It is the first time we have done that. Obviously that is in the interests of transparency and public accountability. In terms of the recent year 2020-21, there was $17.7 million of revenue drawn in through recreational fishing licence fees. There were 474,517 fishers who paid those fees and $16.8 million of new approved funds going out of the trust for projects. Of that, $9.6 million worth of approved programs came into DPI Fisheries. They were for things like the fish aggregation devices, our fish stocking programs et cetera. In terms of the operational overhead component, coming to your question, I will have to take that on notice to give you the correct answer. But like any of the activities that we provide, there are overhead costs, so I will just have to give you the answer on that one, typically.

The CHAIR: While you are taking that on notice, can you provide an explanation as to how those operational overheads are accounted for? Is there a separate cost centre that you park those operational overheads in, or is it sitting with a project-based cost centre? Can you provide a bit finite detail on that?

SEAN SLOAN: Yes.

ANSWER

The application of operational overhead charges relate to indirect (non salary) employee related costs, for example office accommodation and running costs, ICT services and support, Corporate and Human Resources support, Legal Services etc. The current rate included in DPI Recreational Fishing Trust applications is 48% of the base staff wage.

Many external organisations and agencies apply similar overhead charges. The operational overhead funds are held in a separate DPI Fisheries cost centre.

Question 37 (Page 61)

Mr JUSTIN FIELD: I might put some questions on notice then about how many of those visits have occurred and the activities on the ground to deal with that. Under the LLS code components, my reading of the code is that pretty much all of the code-based clearing can only occur based on notification to LLS or a voluntary or mandatory co-compliance certificate being issued. That is correct, is it not?

ADAM TYNDALL: Yes, from memory it is, yes.

Mr JUSTIN FIELD: So you would have some notification of any clearing under the code from a landholder, whether it was a notification or whether it was actually a voluntary or mandatory co-compliance certificate?

ADAM TYNDALL: Yes, we would and all of the certificates are on a public register on our website.

Mr JUSTIN FIELD: You would have a map of that, right?

ADAM TYNDALL: I would have to take that on notice.

ANSWER

Local Land Services does not publish maps of certificates or notifications authorised under the *Land Management (Native Vegetation) Code 2018.*

Question 38 (Page 62)

Mr JUSTIN FIELD: Set asides were also raised in the NRC report as a real concern. Set asides were well under what was estimated when the Act was created. The management code deals with the management of set asides and requires landholders, when requested, to provide records of management actions taken in those set aside areas. How many times since the code has LLS sought records of management actions undertaken in a set aside area?

ADAM TYNDALL: That is something I would have to take on notice, Mr Field.

Mr JUSTIN FIELD: If you could, I would appreciate that. Thank you Chair.

ANSWER

LLS has not made any requests to landholders to provide records of management actions under clause 18(1)(C) of the *Land Management (Native Vegetation) Code 2018.*

Question 39 (Page 67)

The CHAIR: I will just go to the next question on notice. I asked about the Recreational Fishing NSW Advisory Council and conflicts of interest, particularly around the dusky flathead decision. The answer that you came back with was that all members of the advisory council declare their interests in the RFS NSW register of interests at each meeting, and then members are requested to declare any required updates. I have checked the meeting outcomes on the DPI website and there does not seem to be any update of interests along those lines about a recreational fisher who also has a charter business. Perhaps on notice, for people representing those eight regions who also have a charter business, did they make that declaration on their initial form?

SCOTT HANSEN: We will take that on notice.

ANSWER

All three members on the Recreational Fishing NSW Advisory Council, who operate as licensed NSW charter fishing boat operators, originally declared this interest during the application and appointment process for their current terms on the Recreational Fishing NSW Advisory Council Register of Interests.

Question 40 (Page 67)

The CHAIR: On notice, are you able to provide how much we paid Charles Sturt University to facilitate those workshops? Or would that be some sort of—

SEAN SLOAN: I can take that on notice, but that project of $148,000 did involve contracting Charles Sturt University to facilitate the workshops. The CHAIR: Yes. Can you please provide, on notice, that component as to what they were paid out of the $148,000

ANSWER

We have paid CSU $30K (+GST) thus far for the facilitation of industry workshops to examine the barriers to adoption of diversion screening technology.

There are additional workshops being planned for the south of the state following the success of the northern/central events.

Full expenditure of the allocated funds from the Recreational Trust is scheduled for the current financial year.

Question 41 (Page 70)

The Hon. MICK VEITCH: That was an interesting exchange. Mr Chaudhary, would you let the New South Wales Auditor-General have a look at the new contracts to see if they stand up?

ANSHUL CHAUDHARY: These are standard contracts, Mr Veitch. We are not changing fundamentally the terms of any contracts here. We simply are extending the volume out to five years. The contracts are all available on our website.

The Hon. MICK VEITCH: That is not the question. The question is would you let the New South Wales Auditor-General have a look at the contract?

ANSHUL CHAUDHARY: I will have to take that away and have a look at that myself. I am not sure what the outcome there would be.

The Hon. PETER PRIMROSE: If these are standard contracts, what could possibly be the objection to having the Auditor-General have a look at them?

ANSHUL CHAUDHARY: I am not saying I am objecting. I am not sure about the process of what that is, but that is something I can take away and take a look at.

The Hon. PETER PRIMROSE: Well, there is a New South Wales Auditor-General. A concern has been expressed in relation to the liability that may be imposed upon the State in future. It is not an unreasonable thing to say that the person responsible for giving that advice in an independent way should have a look at it. You would be disposed to providing the best possible outcome for the people of New South Wales by ensuring the contract was totally ridgy-didge—to use that legal term—wouldn't you?

ANSHUL CHAUDHARY: I am happy to take that away and have a look at it, absolutely.

The Hon. PETER PRIMROSE: Okay. Well, have a look at it and take it on notice.

ANSHUL CHAUDHARY: Yes.

The Hon. PETER PRIMROSE: I would also be very interested in, if that is not going to be the case, your reasons for not doing that in detail.

ANSHUL CHAUDHARY: Sure

ANSWER

Forestry Corporation's Wood Supply Agreements (WSAs) for sawlogs on the north coast are commercial contracts and have been in place since 2003. The terms of the contract remain the same, with the contract period being considered for an extension of five years. The WSAs are published in full on Forestry Corporation's website.

The provisions of the contract deal with contractual liability matters. The obligations in the contract are underpinned by Forestry Corporation's long-term sustainable yield assessments, which confirm the available timber resource is sufficient to meet timber supply commitments. This review was carried out post the 2019/20 fires and was independently reviewed and published last year.

The role of the Auditor General is to audit finance and performance. The performance of NSW hardwood native and plantation operations has previously been audited by the Auditor General and the recommendations have been implemented.

Question 42 (Page 72)

The Hon. MICK VEITCH: Dr Tracey, a locality like Young, where there is a large number of piggeries with a large number of pig populations—again, heaven forbid if this happens. I am hoping it does not. If it does occur, in a place like Young, you are going to need some large pits for carcass disposal.

JOHN TRACEY: Yes.

The Hon. MICK VEITCH: The last figure I saw was 100,000 sows or something in what was the old Young LGA. I am not sure about the Hilltops region. There are a lot of pigs there.

JOHN TRACEY: Yes. That is something that the teams are very focused on in terms of coming up with practical solutions there. We have looked nationally at appropriate equipment for disposal, as well as trialling some new technologies around that. I can get you some more details on that.

The Hon. MICK VEITCH: I am happy for you to take it on notice and get back to me. That would be really good. The other part of this I am concerned about is the work that is being done to map the wild pig population because they would also clearly assist in the spread of African swine fever.

JOHN TRACEY: That is important not only for African swine fever but also other diseases as well—

The Hon. MICK VEITCH: Foot and mouth.

JOHN TRACEY: —in terms of understanding what that looks like. Our teams have been involved in large-scale mapping programs to get an idea of that. It is also critical, in any disease outbreak like that, to understand the epidemiology of the virus involved. The Japanese encephalitis is a classic example of that. Pigs are one host but, essentially, it is borne by mosquito populations. It is understanding how that looks and what that looks like in terms of the right species and what surveillance we have got in place for that. Feral pigs are part of that system, if you like, in terms of understanding what the epidemiology of the viruses are.

The Hon. MICK VEITCH: I am happy for you to take that on notice and come back to me. That would be good.

ANSWER

NSW DPI worked with NSW EPA and Transport NSW agencies to develop the African Swine Fever Disposal annexure. This document specifically deals with mass disposal of pigs and waste materials in the event of an ASF outbreak in NSW. The document sits as an annexure to the NSW Emergency Waste Sub Plan and was approved by the State Emergency Management Committee on 3 Sep 2021. This plan addresses using

pre-assessed sites for burial, biosecurity management and decontamination requirements based on piggery locations around the state.

NSW DPI invasive species teams coordinated the state-wide collection and collation of feral pig prevalence data in early 2020 with LLS. This builds and updates data collected in 2016 and has been used to inform disease response planning. Since this work was undertaken, the development of the National Feral Pig Action Plan has progressed the National Feral Pig Strategy.

Question 43 (Page 73)

The Hon. MICK VEITCH: As you know, Mr Hansen, I am just a busted up old shearer, but I do the best I can. In December I had the opportunity to attend a shearing school at Muttama. I spoke to the instructors and some really keen and eager young people who are learning how to shear a sheep. It became quite evident that we are investing money in these shearing schools, but they are actually teaching people to shear a sheep. They are not teaching them to become shearers—that is, to earn a living from shearing sheep. There is a big difference. Shear a sheep—like, you learn how to shear a sheep in seven days—excellent. But that does not mean you pay your bills. What sort of work is DPI doing particularly with TAFE and the other RTOs in New South Wales around actually providing quality training and mentorship for young people who go through shearing schools to become a shearer? Not to shear a sheep but to become a shearer.

SCOTT HANSEN: That is an interesting insight about that difference between shearing schools versus—and I will have to look into the Smart and Skilled New South Wales TAFE programs in this space because I do believe that they do more than just "how to shear a sheep". They are trying to pick up—I think they have some AWI support on this front, for New South Wales TAFE to be rolling out programs to pick school leavers up and to actually attract gap year students and school leavers to a shearing career. But I am not aware of what the full components of that course look like, as to whether it ensures that it covers how to set yourself up for a business—the options of both, either mobile shearing versus fixed facilities. But I am happy to look into that and provide you with some more detail.

ANSWER

There are four Registered Training Organisations (including TAFE NSW) that are approved by the national regulator (ASQA) to deliver the Certificate III in Shearing in NSW. This national qualification contains eight units of competency that students must achieve to obtain the qualification. Fee-free funding is available under the NSW Government's Smart and Skilled program administered by Training Services NSW under the Education Portfolio to support the delivery and uptake of this training. Shearing qualifications are on the NSW Skills List that directs funding priorities in the training market for both full qualifications (fulltime programs) and traineeships. Incentives are currently in place for traineeships, both for the trainee and employer. The traineeship program allows students to be supported in their skill development and proficiency by both their employer and trainers over a period of 12-18 months.

As referenced, Australian Wool Innovation (AWI), the research, development (R&D) and marketing organisation responsible for the Australian wool industry, have undertaken a range of training initiatives to increase the number of shearers and shed hands in the sector. These programs, such as shearing schools, are important for attracting new entrants to shearing and introducing them to skills and a career path in industry. It is

appropriate and pleasing to see industry taking a lead role in this. A forward program of shearing schools across NSW has been advertised by AWI up to June 2022.

AWI has also introduced a program called ‘Breaking down the Barriers’ – aimed at getting novices a start with contractors. Two major barriers were the cost of gear (handpiece, combs/cutters, etc) for the new entrants and also the cost to the contractors putting on a novice (if they are shearing under 73 sheep per day and the contractor must pay them the minimum shedhand wage – then the contractor is out-of-pocket).

Question 44 (Page 74)

The Hon. MICK VEITCH: But are you? Does DPI engage in any way with the RTOs or with TAFE around the mentoring part? This is the element that I think is missing in a lot of the training.

SCOTT HANSEN: I am going to say we have not been.

The Hon. MICK VEITCH: That is okay. You can take it on notice if you want, just to be certain.

SCOTT HANSEN: We are in a group that actually addresses attraction, training and retention. We are working with the NSW Wool Technical Advisory Group, as it is called. It has got AWI, Shearing Contractors Association of Australia, Australian Agricultural Training, National Council of Wool Selling Brokers of Australia, TAFE NSW and ourselves. We do sit on that group to try to address those issues. I do not know, outside of us participating in that, what other activities we have, so I could come back to you if there are more.

The Hon. MICK VEITCH: That would be really good.

ANSWER

NSW DPI are working with the NSW Wool Technical Advisory Group. This group is coordinated by NSW Farmers Association and includes representation from Australian Wool Innovation (AWI), Shearing Contractors Association Australia, Australian Agricultural Training, National Council of Wool Brokers, and TAFE NSW. NSW DPI also participates in the NSW VET Consultative Forum and the NSW Industry Training Advisory Committee. These groups identify emerging training needs, skills gaps and shortages and training priorities rather than mentoring. It is critical that industry themselves play an active role in mentoring.

Question 45 (Page 74)

The CHAIR: Yes, sure. We will try to clear the decks before we leave. Mr Sloan, during the last estimates I asked some questions on the utilisation of the eco huts. You provided some 2020 data. We would probably agree that 2020 was not a good year for people getting out and about and enjoying a trip away. On notice, are you able to provide some more longitudinal data. I think the program started in 2018, from memory.

SEAN SLOAN: That sounds about right.

The CHAIR: Can we get a bit more of a longitudinal view in terms of those occupancy rates, in fairness so the data does not look the way it does.

ANSWER

Year	Number of Eco Hut Bookings
2018	67
2019	2
2020	126
2021	12
2022	28 (as of 16 March 2022)

Question 46 (Page 75)

The CHAIR: I might turn to the stock assessment of mulloway. I note in the status summary of 2021 you say that commercial landings of mulloway in New South Wales have steadily declined from almost 400 tonne in the mid-1970s to a historic low of 37 tonne in 2008-09. They have gone back up to 110 tonne. That assessment seems like it did not include social influences over that time period, and that has been critiqued in some research through the University of Wollongong where the concerns were raised that in 1970 there were 5,000 commercial fishermen, when clearly now there are significantly less. So perhaps on notice you could respond to these concerns and tell us whether they have been considered as part of the assessment. There is the decline in actual commercial fishermen from 5,000 in 1970 to under 1,000 now. There were obviously some changes in size limits that occurred in the eighties and also the nineties, where we originally had a 38 centimetre size limit and now we are up to a 45 to 70 size limit. Has that been factored in in terms of why we have seen a decline in commercial landings, because it seems like it possibly has not and that might help explain why there has been such a significant decline? It probably will not explain all of it, but it may explain some of it. So perhaps on notice you could respond to those concerns, unless you have got some answers for it now?

SEAN SLOAN: I am happy to take it on notice to give you a detailed response, because fish stock assessment, as you can appreciate, is a complicated exercise

ANSWER

The most recent Mulloway Stock Assessment is available on the website https://www.dpi.nsw.gov.au/__data/assets/pdf_file/0005/1329611/stock-status-summary-2021-mulloway.pdf

The report identifies and explicitly describes the changes in fishing effort through time, and changes in catch rates through time allow changes in the number of commercial fishers, ie effort, to be recognized in stock assessments. A footnote on page 5 of the report explains how changes in effort are accommodated in the stock assessment.

The stock assessment for Mulloway uses a weight-of-evidence approach considering all the information available (catch, effort, catch rates, size, and age composition), placing the greatest weight on evidence underpinned by data and analyses in which we have the greatest confidence in. Because of the identified changes in fishing effort (declining fishers and days fished) and management regulations (changes to size limits) through time, reported catch, effort and catch rates are not given high weight within the assessment and are therefore not influential in determining stock status. The greatest weight within the assessment is given to analyses underpinned by the size and age composition of the stock, which is not affected by changes in fishing effort and management regulations through time. These analyses indicate that mortality due to

fishing has been excessive since at least the early 2000s and have resulted in a current spawning stock biomass which is estimated to be less than 20% of it's unfished state. Consequently, the current stock status for Mulloway is assessed to be 'depleted'.

As part of the Mulloway Harvest Strategy, technical experts on the Working Group have thoroughly reviewed and provided expert advice about the Mulloway Stock Assessment to DPI scientists.

Question 47 (Page 76)

The Hon. EMMA HURST: I would like to ask some questions about SMART drumlines. If non-target animals are hooked by the SMART drumline, are they tagged or are they released without a tag?

SEAN SLOAN: The general practice is to tag and release the animals, and the reason for that is that it contributes to our knowledge of movement patterns and the overall biology. That is the practice.

The Hon. EMMA HURST: With the non-target animals, because they are tagged, do you have an idea of their survival rate after the physical trauma of having a hook through their mouth?

SEAN SLOAN: Yes, we do. We use a number of different types of tags, but satellite tags allow us to track the movements over quite large distances of those animals. I do not have the exact figure available to me at this moment—

The Hon. EMMA HURST: If I could get it on notice, that would be really useful.

ANSWER

47a) All non-target sharks are tagged with the same type of identification tag used in the NSW Gamefish Tagging Program. Other non-target animals are not tagged, e.g. turtles, rays.

47b) Non-target animals are not tagged with acoustic or satellite tags that could provide a definitive estimate of the rate of survival. However, the identification tags that we use have enabled us to confirm that we have recaptured Greynurse Sharks, Common Blacktip Sharks, loggerhead turtles (tagged previously by National Parks & Wildlife Service), Bull Sharks, White Sharks and Tiger Sharks.

Question 48 (Page 76)

The Hon. EMMA HURST: I understand that DPI representatives have told animal protection groups that work in this space that critically endangered grey nurse sharks cannot be tagged due to their sensitivity to the capture and handling. Is that correct?

SEAN SLOAN: I will have to take that on notice, Ms Hurst.

The Hon. EMMA HURST: Are any SMART drumlines installed in the vicinity of grey nurse critical habitat sites?

SEAN SLOAN: I do not believe so, but I would have to take that on notice to be sure.

The Hon. EMMA HURST: If you could. If you could also find out, if there are any, how close any of those SMART drumlines are to critical habitat sites for grey nurse sharks.

ANSWER

48a) Greynurse Sharks are tagged with identification tags like all other sharks. Only the target species (White, Tiger and Bull Sharks) are tagged with acoustic tags so that they can be detected by the network of tagged shark listening stations and reported on the SharkSmart app.

48b) SMART drumlines are not deployed in any critical habitats of Greynurse Sharks or in Sanctuary Zones of Marine Parks. The closest SMART drumline to a Greynurse Shark critical habitat is the SMART drumline at South Maroubra, which is approximately 400m from the critical habitat.

Question 49 (Page 76)

The Hon. EMMA HURST: Has there been any further research on the impacts of SMART drumlines on grey nurse sharks specifically regarding post-release survival or sub-lethal impacts?

SEAN SLOAN: Not to my knowledge.

The Hon. EMMA HURST: Could you take it on notice to confirm if there was any research in that space? The SharkSmart website states that sharks caught in SMART drum lines are tagged and relocated approximately one kilometre offshore. Can you explain how the relocation works? Are sharks actually dragged out to sea with the hook still inside them? Is that the relocation process? I have seen a lot of images that show it in that way. I can table this, but I am sure you have seen some of these images yourself. Is that the relocation process?

SEAN SLOAN: No, the sharks are brought alongside the boat and they are handled, they are tagged and then they are relocated offshore. I can take it on notice and provide the specifics of the way that procedure operates, but it is all designed to look after the animal, and obviously when you are tagging an animal you actually want to maximise the survivability of the animal.

ANSWER

49a) That is correct, there was no specific research on the survival of Greynurse Sharks following capture on SMART drumlines.

49b) The following is an excerpt from the SMART drumline protocol provided to all DPI Contractors to ensure the safety of contractors and for the wellbeing of sharks and other marine life.

Relocating and releasing tagged sharks process for operators:

On arrival at the SMART drumline, firstly assess the movements of the gear to establish the health of the animal. Approach the SMART drumline and clip to the bull ring on the trace to the hook rope, and release the shark clip that is attached to the yellow trigger bungee. This will allow the MLI-s© buoy, two red buoys and anchor gear to separate from the shark on the hook line. Next step is to then secure the shark to the vessel using a tail rope first and belly rope second. [

Operators must then double check all the data sheet information is complete: photos, tags, ID, samples, and GPS information. . Ensure the shark is safely secured to the side of the vessel by the hook, belly and tail ropes and proceed to tow the shark to sea for 1km from the nearest beach, ready for release. Once arrived at the release location, remove the hook using tools provided (de-hooking tool and/or long nose pliers). Remove the belly rope and then tail rope at the same time, with one person holding the

dorsal fin whilst observing the health of the shark on release as it swims off. Ensure to always swim the shark holding it up with the dorsal fin before release to improve water flow through gills and oxygen uptake.

Leaving the hook in the shark and then securing it with a rope onto the hook line and ropes over the belly and tail maximises the safety of the contractors, enables safe and easy sample collection, and minimises potential stress and impact on the sharks. As the Department's previous physiological studies have demonstrated, the process has little to no impact on sharks.

Question 50 (Page 77)

The Hon. EMMA HURST: Is part of the process that that hook is removed before that relocation where the boat would move one kilometre away?

SEAN SLOAN: That is my understanding. Let me take that on notice and give you a detailed response

ANSWER

The hook is not removed prior to relocation - see Answer 49b for a detailed response

Question 51 (Page 77)

The Hon. EMMA HURST: In the photos I have seen the hook was still in the face and that is why I was—

SCOTT HANSEN: In which case you are still seeing it being brought in alongside the vessel. Once it is alongside the vessel—because the hook in the mouth continues to provide a risk to our staff who are reaching over the side, the removal of the hook provides our staff with a safe operating environment as well. The sharks normally have a tag put in. They can also have a surgically implanted tag, a microchip, and are then taken out to sea and released—not dragged out with the hook in the mouth as you have got in that image there from Perth. I am happy to provide more detailed standard operating procedures.

ANSWER

The hook is not removed prior to relocation - see Answer 49b for a detailed response

Question 52 (Page 78)

Mr JUSTIN FIELD: Thank you, Chair. Mr Hansen, I just want to acknowledge the work that DPI has done over a number of years around moving to the smart drum lines. Certainly, the language and the most recent tragic death in Sydney is very different to what it was in 2016 when we had those bites up in Ballina. I note the amount of work that the department has done. I think the real community attitude has changed substantially around that, which I recognise and welcome. Mr Chaudhary, I just want to finalise some questions around forestry. The last time we were here I asked you about the level of delivery against the contracts. Obviously, you are in force majeure—or you have been for a period of time. I think the South Coast was about 30 per cent. The North Coast was maybe 60 per cent or 70 per cent. Where are we currently at with delivery against those contractors?

ANSHUL CHAUDHARY: Those figures were, Mr Field, last year. Currently we are, I would say, around 60 per cent in the South Coast.

Mr JUSTIN FIELD: Right.

ANSHUL CHAUDHARY: And, of course, North Coast has been severely impacted by bad weather so that would be well below.

Mr JUSTIN FIELD: Sure, right now; but before the weather, where was it up to?

ANSHUL CHAUDHARY: I will probably have to take that away and take that on notice

ANSWER

At the end of February 2022, delivery against north coast contracts was at 80 per cent for the year to date. At mid-March it was approximately 76 per cent due to wet weather.

Question 53 (Page 78)

Mr JUSTIN FIELD: Okay. Well, heaven forbid we would discuss science! I have been receiving several complaints about the state of roads, particularly in the south Brooman and Shallow Crossing. Forest logging has been happening out there since the fires. I know the weather has made this more difficult. I have heard of numerous accidents there—people run off roads and the potholes there causing people to be all over the roads. There are very narrow bends. I drive out there a lot. It is very bad. There is a lot of local tourism. There are some tourist ventures out there, including agriculture as well. Can you take on notice to provide details of the number of complaints that you have received about the state of roads and any roadworks that have been conducted by Forestry Corporation in the Brooman and Shallow Crossing forests since the fires?

ANSHUL CHAUDHARY: Sure. I can absolutely take that on notice and I will just add to that, Mr Field, that we have, after the fires, about 20,000 kilometres of roads that were damaged, and floods, both last year and this year—

Mr JUSTIN FIELD: And they have been damaged three times since then, I know.

ANSHUL CHAUDHARY: So it is difficult and I totally understand. The forest roads are there for forestry purposes, plus having visitation, visitors in there.

Mr JUSTIN FIELD: People do live out there as well.

ANSHUL CHAUDHARY: Yes, but it is primarily for—you know, it is four-wheel-drive-type roads, as you would have experienced. But I am happy to take that away on notice and let you know.

Mr JUSTIN FIELD: Thank you. I appreciate that.

ANSWER

Forestry Corporation receives correspondence raising a broad range of issues. Correspondence is not categorised in this way.

While State forest roads are free to use, they are not part of the primary road network and are maintained for forest management and firefighting purposes. Forestry Corporation does not record expenditure on road maintenance by forest.

In the hardwood forests it manages on the south coast, Forestry Corporation has undertaken works to a value of approximately $6.5 million in road repairs, maintenance and other works to make roads and trails safe since the 2019-20 fires.

Question 54 (Page 82)

Mr JUSTIN FIELD: Mr Hansen, this question may be for you. Do you know where the financial assistance that workers at the Blue Ridge Hardwoods are receiving is coming from?

SCOTT HANSEN: That is actually not one for us. Sorry, I do not know.

Mr JUSTIN FIELD: It is $150,000 per person and the payments are due to Blue Ridge Hardwoods not securing a future wood supply agreement and ceasing operations. You do not know which government agency is funding that money?

SCOTT HANSEN: I know it is not DPI and I assume it is not LLS.

STEVE ORR: Yes, it is not LLS. I think it came out of the broader DRNSW cluster, Mr Field. Perhaps we can take it on notice.

ANSWER

The Department of Regional NSW coordinated the implementation of the support for Blue Ridge Hardwoods Retrenched Workers program.

The Monaro Kangaroo Grass Strategy

Stuart Burge B.Sc.Agr

August 2018

Source: Snowy Interstate Landcare Committee

Stuart Burge & Associates
Agronomy and NRM Consultants
PO Box 219 Cooma NSW 2630

The Monaro Kangaroo Grass Strategy

A leap forward in native grassland conservation and management on the Monaro

Stuart Burge B.Sc.Agr

Goal:

To locate and protect Kangaroo Grass based native grasslands as surrogates (indicators) of high conservation value natural grasslands on the Monaro.

At the same time:

To assist landholders in the assessment of native pastures of low conservation value which can be earmarked for pasture development and increases in agricultural productivity; as well as those native grasslands of medium conservation value which may be enhanced through appropriate management.

Objectives:

Biodiversity Conservation Target

The biodiversity conservation target for this Strategy on the Monaro is as follows:

Native Grasslands of High Conservation Value: 5 800 to 7 500 ha.

Native Grasslands of Medium Conservation Value: 90 000 ha.

Together these represent in the order of 100 000 ha of native grassland which will be identified and managed in order to bring about their preservation (areas of high ecological value) or to enhance their biodiversity conservation status.

Engagement with Landholders

To proactively engage with private landowners through the development and implementation of an extension campaign which facilitates the adoption of the Monaro Kangaroo Grass Strategy in order to help achieve the biodiversity conservation targets and bring about increases in agricultural production.

Background

Regulatory History – a brief summary

The following overview is extracted from: "Native vegetation clearing in NSW: a regulatory history Briefing Paper No 05/2014 by Alec Bombell and Daniel Montoya, NSW Parliamentary Research Service.

Since the 1980s the extent to which governments can regulate the clearing of native vegetation on private land has been the subject of continued debate.

The clearing of native vegetation in NSW has been regulated, to varying degrees, since 1881.

Native vegetation clearing on public land was first regulated by the Ringbarking on Crown Lands Regulation Act 1881. The Soil Conservation Act 1938 introduced native vegetation clearing controls for the first time on private land, albeit at first only in an indirect manner.

Against the background of increasing awareness of environmental issues in the 1980s, the Carr Government embarked upon a process to reform native vegetation regulation in NSW. The first step was the introduction in 1995 of the first instrument to specifically regulate native vegetation clearing, State Environmental Planning Policy No. 46 – Protection and Management of Native Vegetation (SEPP 46).

Background to introduction of SEPP:

SEPP 46 was introduced as an interim measure, never intended to provide a long term regulatory framework. Its sudden introduction, without prior consultation, was designed to prevent a rush of speculative clearing by landholders fearing tighter regulation through the reform process.

The object of SEPP 46 was to prevent inappropriate native vegetation clearance in the State. "Native vegetation" was defined as vegetation that is indigenous to the State, including trees, shrubs, understorey plants and specified native grasslands,

Clearing native vegetation did not include "sustainable grazing", a term which was not defined in SEPP 46.

Response to SEPP 46:

The policy behind SEPP 46 was generally supported by the general public. In light of the increasing awareness raised in the 1980s and 1990s of the problems associated with broad-scale clearing of native vegetation, the need to introduce controls to prevent inappropriate clearing was broadly recognised.

However, the method adopted by SEPP 46 was met with strong opposition and consternation amongst rural communities. Chief among the criticisms was that there had been no community consultation prior to the gazettal of the SEPP. Further, the NSW Farmers Association, in a submission dated April 1996 to the NSW Government, argued that the SEPP was 'inflexible, unworkable and counterproductive'.

According to the Association, farmers, being the caretakers of the land responsible for its continued health and productivity, would not allow an activity to take place that would harm the environment, as doing so would threaten the very nature of their existence."

Since the introduction of SEPP 46 in 1995, further legislation has been subsequently introduced into NSW with a focus upon native vegetation controls and management.

These have included:

- Native Vegetation Conservation Act 1997 (which came into effect on 1 January 1998).
- Native Vegetation Act 2003
- Biodiversity Conservation Act 2016

It is not the intention of this Report to comment on native vegetation legislation.

However, it needs to be understood that "regulatory control of grassland management under SEPP 46 and the Native Vegetation Conservation Act was met with great hostility and on-going resistance on the Monaro, partly due to two factors:

i. Farmers felt that they already appreciated many of the qualities of grasslands and so already managed them well because the viability of their enterprises depended upon them, and

ii. Grasslands have very high temporal and spatial variability, therefore are very difficult to effectively regulate." (Southern Rivers CMA 2005).

This first point is best encapsulated in the following comments by a local grazier and one of the principal instigators of the Monaro SEPP 46 Liaison Committee upon attending a public forum at Cooma when SEPP 46 was first announced:

"The indignation and animosity present on that occasion was almost palpable. Landholders, some whose families have been graziers on the Monaro for generations, felt openly insulted that their management was now under question and regulation and control were being put in place without a word of warning let alone prior consultation. As a public relations exercise it was a disaster …"

The second point is consistent with the ongoing question over whether in fact grasslands should be included under broader native vegetation legislation.

It needs to be recognised too that the legacy of SEPP 46 remains today. Many landholders on the Monaro still maintain a strong suspicion of government agencies working in this field and the regulatory framework for native vegetation management. This applies to both state and federal legislation.

A proactive response to SEPP 46 – The Monaro Grasslands Management Plan

Despite the incredulity and hostility of the entire grazing community on the Monaro to the introduction of SEPP 46, the response was one of attempting to proactively develop a response to the legislation. This was initially through the formation of 'Monaro Landcare', an umbrella group formed to represent the 18 individual Landcare groups throughout the region at the time. Landcare was recognised as being the ideal community based organisation for addressing this issue because of its focus upon the environment and because it had the credibility and support of landholders. Subsequently, and at its very first meeting, it was decided to "put together an alternative to the Government's SEPP46". This culminated in the formation of the Monaro SEPP 46 Liaison Committee and the subsequent development of the 'Monaro Grasslands Management Plan' in 1996.

The Monaro Grasslands Management Plan was - and still is - an innovative and visionary approach to the management of the Monaro native grasslands. It is noteworthy - and perhaps not unsurprising - that much of its overall strategy and thinking is consistent with and has been influential upon this particular Strategy developed over 20 years later.

For example this comprehensive document addresses the following subject areas:

- A description of the Monaro environment and the Native Grasslands
- The Value of Native Grasslands
- High Conservation Value native Grasslands, their needs and management
- Guidelines for Assessing the Conservation Value of Grasslands
- Guidelines for the Management of Monaro Grasslands, including Planning Tools; Role of Incentives; and Education, Research and Extension

It is noteworthy that the aim and objectives of the Monaro Grasslands Management Plan are as follows:

"The spirit of the Plan embodies the notion that The Plan is prepared with a positive view toward the need to conserve grassland ecosystems in conjunction with profitable and sustainable farming practices. Regional biodiversity will be conserved under The Plan, which will conserve adequate minimum areas for conservation of species and ecosystems. Landholders of the region should recognise the need for higher levels of conservation where possible".

"A further aim of The Plan is not to compromise farming enterprises. It is noted that the best way to ensure nature conservation is in conjunction with profitable practices." (Monaro SEPP 46 Liaison Committee 1996)

It needs to be emphasised that the overall aim and objectives of The Monaro Grassland Management Plan as stated here are the same as those of this Monaro Kangaroo Grass Strategy.

A particularly noteworthy feature of the 1996 Monaro Grassland Management Plan is a "vision for the Monaro".

"The Monaro of 2020 will be an era in which:

- *Conflict between productive agriculture and environmental management has been resolved*
- *Governments have embraced all land use and management issues under one umbrella and given equal importance to all*
- *Skills and knowledge are shared*
- *Invasive weeds and destructive feral animals of the last century have almost been destroyed*
- *Understanding and knowledge of threatened and endangered flora and fauna have increased and habitats preserved and restored to ensure survival*
- *Areas of intact native grassland remain in a state of high integrity owing to enlightened management and control of exotic weeds and pests*
- *Voluntary conservation agreements have become widely accepted and an integral part of most farm property plans".*

This vision is noteworthy for two reasons:

Firstly, it demonstrates the commitment of landholders to "matters that concern our livelihood, our property and our resources, be they economic, environmental or social" (NSW Grassland Society 1996).

Secondly, less than 18 months away from 2020, it is appropriate and sobering to revisit this 'vision for the Monaro' and to ask how close we are to achieving those stated goals.

It is perhaps also worth questioning whether the regulatory approach of government which has been central to native vegetation management since SEPP 46 has been effective in helping to achieve this vision …?

The following section may well contribute to our understanding in answering that question ….

Best Practice Conservation of Native Grasslands

It is noteworthy that the imposition of SEPP 46 in 1995 as the "first instrument to specifically regulate native vegetation clearing" in NSW subsequently led to the development of the Monaro Grasslands Management Plan in 1996 as being a farmer conceived and farmer driven approach to native grassland management.

However, also of significance at that time was a project being undertaken by James Ross with a Report published by World Wide Fund for Nature in 1999 entitled "Guide to Best Practice Conservation of Native Grasslands".

The aim of this Project was “to ensure that the most successful methods developed for grassland conservation are documented and applied to current and new on-ground projects and that the benefits of grassland conservation to landholders and the broader community are maximised.”

“The project aims to develop a practical vision of the nature of landscape-scale temperate grassland conservation and the means for its realisation. The substantial occurrence of native grasslands on private land suggests a necessary link between conservation of native grasslands and sustainable production.” (Ross 1999).

This latter point is especially worthy of attention because it highlights the need to balance conservation of native grasslands with sustainable agricultural production. This too is the intent of both the original Monaro Grassland Plan and this Strategy.

Within the context of this project, a number of “best practice” recommendations in relation to the conservation of native grasslands are provided (Ross 1999):

Best Practice – Priorities:

Although all remaining areas of native grassland are valuable there is unlikely to be sufficient capacity in any region to protect all known native grassland sites through active means.

Native grassland conservation programs should aim therefore to address the protection of sites that are the highest priority for conservation in the region.

A variety of approaches can be used to assign priority including focal species and umbrella species.

Best Practice – Strategy:

Grassland conservation programs should adopt a strategic approach to biodiversity conservation through concentrating on achieving protection for priority sites.

The community should be closely involved in the development of all strategies as many of the actions will either be performed by them or require their support.

Best Practice – People:

Well-delivered extension programs are fundamental to the success of all elements of grassland conservation.

Extension programs should aim to generate long-term protection for high priority sites on both public and private land.

All extension programs should have access to suitable incentives for maintaining or adopting conservation management.

Extension is a specialist job requiring an understanding of community dynamics and personality types.

Best Practice – Mechanisms:

Vegetation retention controls through regulation and legislation apply to native grasslands. Unfortunately these controls appear to have had little impact in halting the decline of grassland communities.

Regulations to prevent clearing of native grasslands are an essential safety net. However, regulations on their own will not bring about or maintain long-term management for biodiversity.

Management agreements can often be secured for native grassland areas especially on relatively unproductive parts of properties. However, innovative incentive schemes may be required to secure agreements over large or potentially productive areas.

Best Practice – Incentives:

For properties that have native grasslands of high conservation significance, a targeted approach that considers the whole-farm situation is desirable.

Best Practice – Stewardship:

A genuine commitment is required from government or other contracting organisations to provide ongoing advice and resources."

Summary

It is apparent that the Monaro Grasslands Management Plan developed by the Monaro community and the Ross (WWF) Report (1999) outlining the Best Practice Conservation of Native Grasslands have much in common especially with the necessary link between conservation of native grasslands and sustainable production.

However they also have one notable feature in common: both of these documents have effectively been either overlooked or ignored. The Monaro Grasslands Plan was quickly discounted by government and its strategic approach and ownership of grassland management disregarded.

Similarly, it has hard to reconcile the recommendations and findings as outlined in the Guide to the Best Practice Conservation of Native Grasslands with the continued almost sole focus upon the regulatory approach to native grassland management together with a major emphasis upon scientific investigation and the development of complex floristic assessment criteria. This is especially difficult to comprehend when it is acknowledged that the native grasslands of the Monaro are more vulnerable today than ever, for reasons which are outlined in this Report.

Within this context, the following quotation taken from the foreword to the recent book, "Land of sweeping plains: managing and restoring the native grasslands of south-eastern Australia" by Dr Richard Groves, who has had an illustrious career in native grassland research and been passionately involved in conservation for over 50 years and a keen member of the Friends of Grasslands, provides us with some insight and serious food for thought:

"It is certainly no longer sufficient to create conservation reserves or to legislate certain iconic plant or animal species or communities as 'endangered', important though such activities have been. Natural grasslands need to be actively and adaptively managed if our grandchildren are to appreciate their beauty and care for their floristic diversity …."

"We have come a long way in our understanding of the ecology and management of native grasslands. Much less is known about how to engage the community to appreciate and care for what little remains …." (Williams et al. 2015).

There is undoubtedly a need to adopt a new approach (or perhaps re-visit the past?) - one which incorporates some of the thinking as described above as well as the proactive engagement and support of landholders - if we are to have any hope of saving the native grasslands of the Monaro from their "irreversible degradation".

The purpose of this Strategy and this Report outlines how this will hopefully be achieved.

Introduction

The conservation of native grasslands on the Monaro and elsewhere has been the subject of considerable investigation, survey, analysis, discussion and reporting over many years. For example, it is suggested that "native grasslands are now one of the most studied ecosystems in Australia." (Williams & Marshall 2015).

Each investigation has broadly the same overall approach with primary aims such as:

- the identification of remnants of native grassland
- the floristic classification and description of grasslands, which will facilitate conservation and management on ecological grounds
- an assessment of the significance of remnants (McDougall and Kirkpatrick 1993)

The aim of this Strategy is not to define the precise botanical characteristics of what constitutes a native grassland of high ecological value. Instead, it is to provide a simple, reliable and effective guide to enable landholders to identify and locate those areas of their properties which in all likelihood are of higher conservation value and which therefore are worthy of protecting. At the same time, to be able to differentiate these from grasslands of low and medium conservation value.

In doing so it must be emphasised that the principal focus of this Strategy is upon those high conservation sites on private grazing lands which are the most easily identifiable due to the presence of Kangaroo Grass as a key indicator species and a surrogate for a native grassland of high conservation value.

It is acknowledged that that there will be areas worthy of conserving and protecting where kangaroo grass has now disappeared and been replaced by other species. It is to be hoped that such areas will be able to be identified as part of the assessment methodology in this Strategy. However, it is again emphasised that the aim is to target "the lowest hanging fruit" – that is, those grasslands which are

the easiest to find due to the presence of Kangaroo grass. This approach is entirely consistent with one of the best practice recommendations of Ross (1999) which advises:

“Although all remaining areas of native grassland are valuable there is unlikely to be sufficient capacity in any region to protect all known native grassland sites through active means.

Native grassland conservation programs should aim therefore to address the protection of sites that are the highest priority for conservation in the region.”

This necessity is heightened because the “clock is ticking” for these native grasslands due to the increasing threat of noxious weeds which threaten their “irreversible degradation”.

It is also to be expected that such an approach will be deemed by some as being too “simplistic”. Again however, it is not the purpose to define the precise ecological properties of high conservation grasslands nor to undertake a detailed floristic classification of grasslands. Rather, it is to develop a methodology which is easy to undertake by all landholders after being provided with rudimentary training in plant identification.

Such thinking has received the overwhelming support of landholders.

This is not to dismiss the importance of more detailed floristic evaluation but rather this approach provides a segue to the more comprehensive assessment process for the purpose of further defining and differentiating between various condition categories if landholders should choose to do so (for example, to access funding for the protection of very high ecological value sites – the so-called “best of the best” - under Biodiversity Conservation Trust) or if there is a regulatory need.

By contrast there is also a need to identify and distinguish those native grasslands and pastures of little or no conservation value. While there has been much discussion and many references to the fact that such an approach is warranted, the focus has always been upon describing high quality grasslands with little consideration of the other end of the spectrum. These highly modified or degraded native pastures represent by far the majority of the extent of the Monaro native grasslands (in the order of 75 %).

It is considered that the approach as developed and used in this Strategy is unique because it works on the premise that regulation has largely been ineffective in achieving its stated conservation objectives in relation to grasslands. This is despite the best intentions of government and government agencies. Rather the approach as outlined in this Strategy is consistent with that adopted by Monaro landholders in 1996 in response to SEPP 46 who proactively developed a conciliatory approach to the management of the Monaro grasslands as outlined in the objectives of the Monaro Grasslands Plan.

Furthermore it is also considered to be consistent with the recommendations as outlined in the “Guide to Best Practice Conservation of Native Grasslands”. These include in particular the observation that “vegetation retention controls through regulation and legislation apply to native grasslands. Unfortunately these controls appear to have had little impact in halting the decline of grassland communities. Regulations to prevent clearing of native grasslands are an important mechanism and an essential safety net to prevent destruction of important remnants. However, regulations on their own will not bring about or maintain long-term management for biodiversity.”

Furthermore, and notably, “the community should be closely involved in the development of all strategies as many of the actions will either be performed by them or require their support.” (Ross 1999).

The Monaro Kangaroo Grass Strategy attempts to help meet that challenge by developing an approach and methodology which landholders hopefully will embrace and proactively implement on their properties.

Why Kangaroo Grass?

A number of methods have been developed to measure and assess the conservation status or quality of native grasslands including the ‘Conservation Rating System’ and ‘Floristic Value Score’.

Another such approach - and the one adopted in this Strategy - is that of using ‘Indicator Species’.

Indicator species are “native plant species that are useful surrogates for the conservation value of a particular paddock, site or patch, and are typically disturbance sensitive species” (Commonwealth of Australia 2016).

It is noteworthy that indicator species are used as a component of the assessment process within the federal EPBC Act: “Within the assessment methodology, considerable emphasis and importance is placed upon the presence of so-called ‘indicator species’. Indicator species are described as being ‘native plant species that are useful surrogates for conservation value of a patch, and are typically disturbance sensitive species.’” (Threatened Species Scientific Committee 2016).

To achieve the desired outcome it has been suggested (Hazell 2013) that indicator plants or species should have the following characteristics:

- act as a surrogate for the floristic value score;
- must be easy to identify;
- must be visible for a reasonable period of the year;
- not easily confused with other species;

It should be noted that “this approach does not place particular importance on species chosen as indicator species – it (they) just needs to be a useful surrogate for the full floristic value.” (Hazell 2013).

It is evident that Kangaroo Grass meets all of the above criteria and can therefore be used as the key indicator species to help in the preliminary identification and assessment of higher conservation native grasslands.

Further justification for the use of Kangaroo Grass consistent with these criteria is provided below:

Testimony to the key status of Kangaroo Grass is evident from its acknowledgement as being an“iconic grassland species” (Ryan and Abel 2014). An icon is defined as “something regarded as a representative symbol or as worthy of veneration”.

Friends of Grasslands, whose goal is "to protect and ultimately recover grassy ecosystems", also make the following comment in relation to the role and importance of Kangaroo grass: "*If you only know one grass species it should be this one*, *as it is a dominant grass species of temperate and northern grasslands, and its distinctive inflorescence makes it easy to recognise*".

Importantly, the role and significance of Kangaroo Grass in grassland ecology is also acknowledged and reported by scientists and ecologists.

This status is acknowledged by Snyman, ('Lochy') Ingram and Kirkman (2013) who title their comprehensive benchmark review paper 'Themeda triandra: a keystone grass species'.

A keystone species is defined as "a plant (or animal) that plays a unique and crucial role in the way an ecosystem functions. Without keystone species, the ecosystem would be dramatically different or cease to exist altogether. Such species are described as playing a critical role in maintaining the structure of an ecological community, affecting many other organisms in an ecosystem and helping to determine the types and numbers of various other species in the community" (Greentumble 2016).

("The term 'keystone species' is likened to the role of a keystone in an arch. A keystone is under the least pressure of any of the other stones in an arch, but the arch will collapse without it." (Greentumble 2016).

In terms of the ecological importance of Kangaroo Grass as a keystone species, Snyman et al (2013) suggest that "Kangaroo Grass is widespread across Australia and is thought to be the original dominant species in all of Australia's grasslands".

Similarly Moore (1959) describes Themeda australis (Kangaroo Grass) as being "the principal species throughout southern Australia" while Meredith and Mitchell (1990) state that "this grass (Kangaroo Grass) was probably the original dominant of all Australian grasslands".

Kangaroo grass also is considered of critical importance in terms of its contribution to the ecological integrity of native grasslands, as an indicator of a high conservation native grassland and, conversely therefore, a predictor of disturbance or environmental modification.

Snyman et al (2013) repeatedly emphasise this point: "Themeda is considered a climax or sub-climax species and an indicator of grassland in good condition that declines in abundance when overgrazed or underutilised. It is one of the most ecologically and economically important and widespread grasses, despite not being a strong competitor, not being very efficient at reproduction and distribution, and not being particularly tolerant of disturbance and drought."

"Themeda is an extremely important species wherever it occurs. Its importance stems as much from the fact that it is an indicator species of overgrazing ….and that it is often associated with high levels of vegetation diversity."

It is evident then that Kangaroo grass is highly susceptible to both grazing intensity together with changes (increases) in soil fertility and for this reason its presence and/or level of occurrence is a useful guide to changes in these factors. The response to changes in fertility as well as defoliation by grazing should also be assessed relative to other species which are better adapted to such changes and therefore better able to compete and ultimately therefore replace Kangaroo grass. For example,

“Kangaroo grass declines in production and cover with increasing Nitrogen levels and is also unable to compete with exotic species even under low nutrient supply.” (Groves et al 2003).

While the capacity of introduced species to proliferate and compete with native species under raised fertility is well recognised, some native species are also able to respond. Research has found that Poa labillardieri is more efficient than Themeda in the extraction of both Phosphorus and Nitrogen from the topsoil due to a higher level of surface roots and therefore is better able to outcompete Kangaroo Grass when grown together (Groves et al 2003).

Within the context of the broader Monaro landscape where Poa sieberiana (Snow Tussock) is far more widespread, Benson (1994) comments, “If it is assumed that the same finding would apply to Poa sieberiana, then the widespread use of superphosphate on the Monaro may have advantaged Poa sieberiana over Themeda australis.” It is to be expected that a similar response would apply to the use of gypsum which is used to address sulphur deficiency on the basaltic treeless plains of the Monaro where Poa sieberiana now is the dominant species but which was previously an extensive area of natural temperate grassland at the time of settlement.

A similar such situation exists in relation to the susceptibility of Kangaroo Grass to grazing. “A combination of frequent defoliation caused by preferential or selective grazing by sheep and cattle especially in the early growth stages together with susceptibility to drought leads to tiller loss and plant mortality.” (Snyman et al 2013). This is summarised accordingly: “that Themeda declines if continually grazed or undergrazed is well known.”

This vulnerability to grazing is reiterated by Benson (1994) who highlights the responsiveness of Themeda to summer rainfall which proliferates when grazing is excluded but “does not withstand continued heavy grazing.” (It is noteworthy that African Lovegrass which is now a widespread weed throughout the Monaro and which threatens the existence of the native grasslands, is physiologically similar to Kangaroo Grass (both being C4 grasses) with pronounced response to summer rainfall. However, unlike Kangaroo Grass, African Lovegrass is extremely tolerant of continuous heavy grazing).

Similarly, the Australian National Botanic Gardens (2015) advises that, while acknowledging that Themeda triandra itself is not endangered as a species, the temperate grassland communities in which it grows are under threat due to “loss and fragmentation and through inadequate land management practices.” Notably it is stated that “As Kangaroo Grass does not tolerate heavy or continuous grazing, it can be a useful indicator of the level of disturbance in an area”.

The role of Kangaroo Grass as an indicator species for grasslands of high conservation value on the Monaro can be summarised accordingly (Sharp et al 2015):

“Research has identified particular native and exotic species that respond to nutrient levels, biomass management regimes and site disturbance , and it is therefore possible to infer information about a site from the presence of these key indicator species. For example, livestock prefer to graze Kangaroo Grass. Therefore, the presence of a grassland with little Kangaroo Grass present, in a region that is dominant in reference grasslands, indicates a likely history of heavy grazing, and a corresponding loss of other grazing-sensitive species. It should be noted, however, that the addition of nutrients (e.g.superphosphate), may also be a factor in the reduced presence of Kangaroo Grass

Kangaroo Grass on the Monaro

Historical Evidence of the Presence of Kangaroo Grass

Consistent with his comments about the widespread presence of Themeda throughout southern Australia, Moore (1959) considers that "Themeda was dominant on much of the Tablelands of NSW, including the Monaro, prior to European settlement".

The journals and writings of the early explorers and government officials provide the best guide to the composition of the grasslands of the Monaro at the time of European settlement. However, just as importantly they provide insight into the historic development of the region and therefore the management factors which may have contributed to the change in the species composition of native grasslands over time.

The first white party to officially discover the Monaro was headed by Captain Mark Currie in June 1823 (although there is some conjecture about whether there were already squatters two years previously). It is suggested that "sheep and cattle followed hard upon the heels of the explorers …." For example Richard Brooks brought cattle onto the Monaro in 1827, "the year of severe drought". (Bredbo Community Landcare 1996).

"Landscape change was accelerated with white settlement particularly with the introduction of herds and flocks of cloven hoofed stock more abrasive to the land than soft padded native animals. The axe, fire, the plough and the rabbit also played a role".

There was little detailed description of the Monaro landscape until 1834 when polish explorer John Lhotsky travelled from Sydney to the Australian Alps. This includes description of the general landscape as well as geology, flora and fauna and human inhabitants.

Lhotsky (1835) noted in his iconic journal that "Kangaroo Grass was abundant".

Interestingly Lhotsky describes lands south of Bredbo as being "the great chain of plains" and that they are "altogether destitute of trees of any type". He also "passed thro dry barren plains".

One of the most comprehensive descriptions of the native grasslands is provided by Alfred McFarland (1872) who wrote in detail on the landscape during the early years of settlement and who describes two aspects of the Monaro:

"But there are other sides of the picture which should also be given; for it must not be supposed that the Monaro is always green. On the contrary in mid winter the withered grass turns into a half-white and half-brown appearance ……During a drought the face of the land changes still more; there is barely a blade of grass to be seen, the hills are glistening with red ironstone, the creeks are dry, most of the rivers have shrivelled up and the sheep and cattle half dead from starvation."

Significantly within the context of this Monaro Kangaroo Grass Strategy, McFarland describes "the tall waving grass of the plains bending before the wind is one of the commonest and not least beautiful sights in "Manaro"; and in the paddocks at Bibbenluke, as well as other places, I have seen acres of grass up to my horses shoulders – though in times of drought , the whole country is bare enough, bare as bare can be." Lhotsky had previously described this grass as being Kangaroo Grass.

This predominance of Kangaroo grass at Bibbenluke together with the previous description of Kangaroo Grass as being "abundant" by Lhotsky is further reinforced by the writings of William Crisp in describing changes at Jimenbuan who recalled:

"Free selection and the introduction of sheep put an end to extensive raising of cattle because of the loss of water and because the best grasses for cattle disappeared and made way for a finer, and, in my opinion, less nourishing grass. I have seen Kangaroo Grass, when in seed, like a field of wheat three feet high. This disappeared." (Crisp 1947).

(It is suggested that this "finer, less nourishing grass" was almost certainly Austrostipa spp - Corkscrew or Spear grass - based on the botanical descriptions of this grassland community as well as personal experience. The spear grasses are recognised as being coloniser species and certainly are regarded as being relatively unpalatable to livestock).

It is evident then that the historical records provide clear evidence to support and confirm the opinion that Kangaroo Grass was widespread on the Monaro at the time of European settlement. These accounts also explain the reasons for the decline and disappearance from the landscape of Kangaroo Grass and therefore high conservation native grasslands as a consequence of the cumulative impact of drought, livestock grazing, rabbits and fertiliser application over the past 180 years. Indeed, in the "Review of Production and Management on Southern Tableland Woolgrowing Properties" published in 1968 by the Bureau of Agricultural Economics, a prominent finding in relation to the role of pasture improvement was that "the non-improving proprietors are stupid people …." (Hancock 1972).

Botanical Surveys of the Monaro

While historical records provide insight into the description of the original native grasslands it is also necessary to investigate the documentary evidence of the composition of the grasslands today.

A thorough understanding and insight into the ecology of the native grasslands of the Monaro is provided by the results of three independent botanical surveys of the region. These provide a guide as to the significance of Themeda and hence in doing so provides justification for its use as a key indicator species as a surrogate of a grassland of high conservation value.

One of the most comprehensive descriptions of the Monaro grasslands is that provided by John Benson in 1994 '*The Native Grasslands of the Monaro Region: Southern Tablelands of NSW*. This is based upon a survey of 62 grassland sites across the Monaro and southern tablelands (including both public and private land) which he classified broadly into eight grassland plant communities consisting of 265 plant species including 189 native and 76 (29%) exotic. Five of the native species were registered as rare or endangered. Sites surveyed were predominantly on public land with some privately owned sites.

Of these 8 communities only three (Communities 3, 4 and 5) represent the broader Monaro grazing landscape. It is noteworthy that the frequency (%) of Themeda in these three communities was: 100 %; 37%; and 20 % respectively. This is despite the long history of grazing, droughts and fertiliser application which together would contribute to its significant decline.

It is noteworthy that in Community 3 (which is described as being the most widespread of the communities ranging from 'Canberra in the north to Bombala in the south and Adaminaby in the west') there was 100 % frequency of Themeda. Benson suggests that "it is possible that Community 3 (*Themeda australis – Poa sieberiana* grassland for which the main dominant species are Themeda and Poa) represents something similar to the original grassland of the lower altitudes in the study area."

Community 4 is the dominant vegetation community on the extensive basalt plateau between Cooma and Bombala. It is suggested by Benson that "Themeda would have been common in this community before European settlement." This is demonstrated by the presence of Themeda at Ravensworth TSR which is located in the heart of the basalt treeless plains and which is highly regarded as being a native grassland of high conservation value.

According to Benson, "Themeda australis may have existed in Community 4 as an inter-tussock subdominant before European settlement. If so it is now uncommon and must have been grazed out or outcompeted. Poa sieberiana , which is a C3 plant, is likely not to have been as dominant in Community 4 at the time of European settlement as it is now." The capacity of Poa to outcompete Kangaroo Grass under conditions of raised fertility due to the presence of a higher percentage of surface roots in the topsoil was previously suggested as being a possible reason for this change.

In relation to Community 5 (Stipa scabra (falcata) – Stipa bigeniculata (ie Corkscrew / Spear Grass), most sites had been heavily grazed and contained only moderate numbers of native plants and a high numbers of exotics. "Themeda may have been more common before European settlement but is now largely absent." It is noteworthy that Community 5 includes the Dalgety and Berridale areas including Jimenbuan where Kangaroo Grass was previously recorded as growing "like a field of wheat ….." (Crisp 1947). Nevertheless it was still recorded as being present in 20 % of sites.

Consistent with previous descriptions, Benson advises that "because of the palatability of Themeda australis, sites where it is recorded as abundant are deemed to have a history of light grazing and therefore assessed as being in good condition. This includes TSR's, railway easements, church yards and cemeteries." This provides further confirmation of the usefulness of Kangaroo Grass as an indicator species.

A further notable feature of this survey is that all of the five nationally rare or threatened species were found growing in Themeda grassland sites.

Another comprehensive survey of the southeast bioregion in which a number of distinctive natural and secondary grassland communities are described is that of Armstrong et al. (2013).

Three major natural grassland communities are identified within the Monaro component of the larger survey area with each described comprehensively including their floristic value scores. These differ from the sub-communities as described by Benson.

The three communities described on the Monaro included the most widespread Community r6: "Monaro Dry Tussock Grassland"; Community r2: "Wet Tussock Grassland"; and Community r7: "Moist Tussock Grassland".

As part of the survey process the botanical composition of each site was determined and then categorised into its ecological community. Amongst other things, each individual species was assessed for its frequency (number of times it occurs) as well as an assessment of its Cover / Abundance . This is undertaken on a scale of 1 to 6 where 1 is uncommon and less than 5% cover; 2 is common and up to 5% cover; 3 up to 20% cover; 4 up to 50% cover; 5 up to 75% cover; and 6 over 75% cover.

A brief description of each community with the relative significance of Kangaroo Grass is as follows (Armstrong 2013):

Dry tussock grassland of the Monaro

Number of samples: 110

Vegetation Description: open to dense, mid-high to tall tussock grassland dominated by one or more of the following: Poa sieberiana, Rytidosperma spp. (Austrodanthonia), Themeda australis, Austrostipa scabra and Austrostipa bigeniculata.

This community is found on a variety of substrates; most commonly on basalt and sedimentary strata, occasionally occurring on granite. It occurs within the drier portions of the Monaro region, commonly referred to as the Monaro rainshadow.

Community r6 sites are dominated by Poa sieberiana and, in undisturbed areas, Themeda australis.

In highly intact samples, such as Ravesnworth TSR and Dartmoor TSR, there is equal dominance of Kangaroo Grass and Common Snowgrass (Poa sieberiana), and a very high diversity of forbs.

In disturbed sites, the Themeda and Poa are replaced by various species of wallaby grass (Tytidosperma syn Austrodanthonia) and Spear grasses (Austrostipa spp.), and few forb species characteristic of the more intact sites remain. In such sites, the forbs that are retained tend to be those described as "disturbance increasers".

Kangaroo Grass (Themeda australis): Cover/Abundance score of 3 (ie up to 20% cover) and Frequency: 71 That is, 71 % of sites on the Monaro were found to have Kangaroo Grass present with an average cover of 20 %.

By comparison Snow Tussock (Poa sieberiana): Cover/Abundance score of 4 (up to 50% cover) Frequency: 94 % of sites with "Poa tussock" which had up to 50% cover.

Moist Tussock Grassland

Number of samples: 133

Vegetation Description: open to dense, mid-high to tall tussock grassland dominated by Themeda australis and with a sub-dominance of Rytidosperma spp. (syn Austrodanthonia) and Poa sieberiana.

This community is found on mid-slopes and foot-slopes and most commonly found on sedimentary, colluvium and granite soils. On the Monaro it is found in the moister outer fringes of the Monaro region beyond the rainshadow areas.

It is noteworthy that this Community is dominated by Themeda australis.

For example the Cover/ Abundance score for Themeda australis is 6 (ie over 75% cover) with a frequency of 100. That is, 100 % of the total number of sites throughout the south east bioregion (including the Monaro) comprises Kangaroo Grass with an average cover in excess of 75 %.

Wet tussock grassland

Number of samples: 45

Vegetation Description: tall, dense or mid-dense wet tussock grassland dominated by Poa labillardierei usually with Themeda australis, the sedge Carex appressa and rush Juncus spp.

Themeda australis: Cover/Abundance Score: 3 (ie up to 20% cover); Frequency: 67% of 45 sites assessed throughout the South East Highlands bioregion contained Kangaroo Grass.

Poa labillardierei: Cover/Abundance: 5 (up to 75% cover) Frequency: 94 %."

It is noteworthy that Poa labillardieri and Carex bichenoviana (along with Kangaroo Grass) are targeted for conservation under the EPBC Act (Natural Temperate Grassland of the South East Highlands Ecological Community). It is anticipated that the conservation status of both these species and the Communities in which they are found (r2 Wet Tussock Grassland) will be enhanced under this Kangaroo Grass Strategy. This is because there is a high likelihood that by locating and protecting Kangaroo Grass based native grasslands this will also protect Poa labillardieri and possibly Carex bichenoviana. This is evident for example from the vegetation description of the Wet Tussock Grassland in which the frequency of Poa labillardieri was also high very high (94 %). This provides a further demonstration of the usefulness of Kangaroo Grass as a surrogate for a high quality native grassland community.

The third survey which further contributes to our understanding and which represents one of the most comprehensive and detailed botanical assessments of the native grasslands of the Monaro was conducted by Rehwinkel et al who surveyed a total of 217 sites throughout the Monaro. The botanical composition of each of these sites was assessed for species composition (including grasses, forbs and sedges) and the results collated.

It should be noted that the majority of the sites assessed were on public lands and therefore tended to be weighted towards sites of higher inherent quality with a lower disturbance history which more closely reflect the original or remnant vegetation. This data provides an excellent guide for the purposes of this Strategy in terms of the prediction of what constitutes a surrogate indicator species.

It is noteworthy in this regard that of the 217 sites assessed for botanical composition Kangaroo Grass was present on 168 or almost 80 % of sites.

(By comparison Acaena ovina (coloniser) was found on 173 or 81.6 %; Rytidosperma (syn Austrodanthonia) spp: 182 or 85.8 %; Chrysocephalum apiculatum (Everlasing /Yellow Buttons): 170 or 80.2 %; Elymus scaber: 169 or 79.2 %; Poa sieberiana 184 86.8 %; Austrostipa spp (coloniser) – bigeniculata: 100 or 46%, Stipa scabra falcate: 144 or 67 %; Bothriochloa macra (coloniser): 103 or 48.58 %; Convolvulus erubescens: 130 or 61.3 %; Geranium solanderi (coloniser): 135 or 63.7%).

Plants which are described as coloniser species because of their capacity to colonise or invade a degraded site are indicated. Austrostipa which is represented by two species (spear grass and corkscrew grass) is described as such species while the invasive capacity of Poa and Wallaby Grass Rytidosperma (syn Austrodanthonia) is well recognised.

Summary

The results of the three independent surveys of botanical composition, together with historical records, provide us with conclusive evidence to confirm the description of Kangaroo Grass as a keystone species and to justify its use as a surrogate indicator species for a grassland of high conservation significance and therefore its use in this Strategy.

To this end one of the most comprehensive descriptions of the role and importance of Kangaroo Grass is provided in an article within the Newsletter of the Monaro Grassland Conservation Management Network by its (then) coordinator David Eddy who in 2004 states:

“Kangaroo Grass is thought to be the dominant native grass in Monaro’s grasslands before European settlement. It was, and still is, often accompanied by Snowgrass (Poa sieberiana) – the two species become co-dominant in areas with higher rainfall and deeper soil. In the wetter parts of the landscape and at higher elevations Snowgrass often becomes dominant.

This natural dominance is attested to today by the fact that, of 16 public cemeteries on Monaro, 15 contain native grasslands clearly dominated by Kangaroo Grass. These cemeteries would have been amongst the least grazed areas in the region during the past 150 years or so. The great majority of high quality native grassland areas in TSR’s are also dominated by Kangaroo Grass or mixtures including Kangaroo Grass. And again the great majority of good native grassland found in commercially grazed areas is either dominated by, or has a strong presence of Kangaroo Grass.

Kangaroo Grass can also be found and was probably previously a prominent species in the more lightly timbered areas, under openings in the woodland and forest canopy and into the many ephemeral wetlands formed by drainage lines and other depressions.

Kangaroo Grass was also a dominant grass species in grassy ecosystems across much of Australia and is still one of the most widespread grasses in the country.

Kangaroo Grass is very distinctive and quite easily identified once you become familiar with it.” (Eddy 2004).

Ease of Identification of Kangaroo Grass

Kangaroo Grass has been chosen as the fundamental basis of this Strategy for two reasons:

Firstly, and for reasons previously outlined, it is a key cornerstone indicator species of a native grassland in good condition; and, secondly, and just as importantly from a practical farmer's perspective, Kangaroo Grass is very easy to identify.

This is confirmed by the 'Friends of Grasslands' who, as mentioned previously, provide the following comment in relation to Kangaroo grass: "*If you only know one grass species it should be this one*, as it is a dominant grass species of temperate and northern grasslands, and its distinctive inflorescence makes it easy to recognise".

Kangaroo Grass has two characteristics which assist in its ease of identification:

1. Kangaroo Grass has a very conspicuous and distinctive seed head which is clearly visible during the period January to March. Experience suggests that in most years the best time to identify Kangaroo Grass is on Australia Day!

   The seed head is made up of a number of modified leafy bracts and is relatively large, often reddish in colour with a drooping appearance. This feature together with the presence of a large black twisted awn which emerges from the leafy seed head makes it resemble a kangaroo in appearance.

2. Another useful time to identify Kangaroo Grass is during winter after the onset of frosts when the older leaves turn from bright green with a tinge of red to a pronounced red/brown colour and it still retains its conspicuous tell-tale seed heads. Even in the heart of winter these red plants still stand out from all other vegetation.

Photo: OEH

Taking these factors into consideration, experience suggests that once you get your eye in, Kangaroo Grass can be detected either in the summer or winter period from several hundred metres away or even when driving at 100 km/hour!

Most importantly, skills in the identification of Kangaroo Grass can certainly be learnt by *all* landholders quickly and simply.

Summary

It is clearly evident that as a consequence of a combination of: scientific investigation; historic evidence; comprehensive and detailed botanical surveys of the Monaro region; together with the practical experience of ecologists and agronomists, Kangaroo Grass satisfies all of the criteria of what constitutes an indicator species:

- acts as a surrogate for the floristic value score;
- must be easy to identify;
- must be visible for a reasonable period of the year;
- not easily confused with other species;

It is also apparent that:

- Kangaroo Grass was largely ubiquitous throughout much of Australia including the Monaro pre-settlement.
- Kangaroo Grass is considered by ecologists and scientists as a climax or sub-climax keystone indicator species and therefore a useful surrogate of grassland in good condition and of high conservation value.
- Kangaroo Grass is highly susceptible to grazing /overgrazing and changes in soil fertility under which conditions it is a poor competitor and therefore susceptible to plant loss and replacement by other species – both native and exotic.
- Accordingly, the presence of Kangaroo grass – even as scattered plants – can be a useful predictor of a grassland of higher conservation value which has not been subjected to heavy or continuous grazing pressure or increase in soil fertility.
- The long history of grazing with sheep and cattle on the Monaro for over 180 years since the 1830's together with the impact of droughts and rabbits has contributed to the decline in the extent and quality of the high conservation grasslands as found at the time of European settlement.

Implementing the Monaro Kangaroo Grass Strategy

The methodology developed for use in this Strategy is consistent with the advice of the Southern Rivers CMA (2005) who similarly suggested that there is a need for both:

- a farmer-friendly assessment technique, probably based on key (easily identifiable) indicator species (such as Kangaroo Grass) to enable landholders to assess likelihood of a grassland being of High Conservation Value

- a farmer-friendly assessment technique based on history of disturbance, which could run parallel to the Site Assessment Guidelines, to enable landholders to assess likelihood of grassland being native pasture or a native grassland

Location of Kangaroo Grass based native grasslands of high conservation value

Background

The Monaro is an undulating tablelands environment with considerable variation in slope, aspect and elevation. Much of the terrain is comprised of granitic rocky outcrops and basaltic surface stone which, together with topographic constraints, precludes regular cultivation and vehicular access. The broad plateau region has a challenging, often harsh climate due to its high elevation, cold winter, short growing season and susceptibility to drought as a consequence of its location in the lee of the Snowy Mountains. Not unsurprisingly therefore the Monaro is almost exclusively a grazing environment, a fact which was acknowledged as early as 1872: “The electoral district of ‘Manaro’ is essentially pastoral country.” (McFarland 1872).

For these reasons the areas which lend themselves to cultivation and cropping and the sowing of introduced pastures are limited to the more gently sloping areas of the landscape with less rock and deeper soils. While the advent of direct drilling of pastures since the 1990’s has increased the area which can be sown to “improved pastures”, it needs to be understood that in most paddocks of the district it is practically impossible to sow any more than approximately 60 to 70 % because of the constrictions of rocky outcrops, shallow lower fertility soils and steep slope.

Consequently the upshot is that the total area on the Monaro in which native grasslands or native pastures can be replaced with introduced species is limited by the physical and climatic constraints. Also, and most importantly, a further significant deterrent is the very high cost of sowing improved pastures together with the high risk of doing as a consequence of the low rainfall and high incidence of drought

The difficult physical terrain and topography also places considerable limitations upon the accessibility of motor vehicles and trucks. While this poses considerable challenges for undertaking routine farm management activities (eg mustering, fencing, weed control), it also means that much country is unable to be accessed by trucks either spreading fertilisers or boom-spraying weeds.

A number of other features of the unique Monaro environment need to be taken into consideration within the context of the implications for the management of native grasslands.

Firstly, unlike much of the rest of the southern tablelands, and for historic reasons, there are many large properties often with large paddocks in excess of 100 ha and often more than 200 ha. It is noteworthy that many of these larger properties are located in the heart of the extensive Monaro "downs" referred to by the early explorers which originally supported the most extensive areas of natural temperate grasslands.

Secondly, throughout most of the past 180 years of grazing, most landholders have exercised a set stocking or continuous grazing regime often at relatively low stocking rates. This means that there has been ongoing selective grazing of the more palatable and susceptible species of native grasses and forbs (including Kangaroo Grass) which has contributed to their demise. At the same time, species of low palatability with a greater competitive advantage (including "coloniser" or "disturbance increaser") native species such as Austrostipa and Poa sieberiana as well as exotic plants and weeds) replace these and therefore substantially change the composition and status of the ecological community.

This situation is also compounded by the introduction of clovers and application of fertilisers which contribute to increased fertility and the decline of some species including notably Kangaroo Grass and some forb species. However, for reasons previously described, the physical difficulty of the terrain means that some areas are unable to be fertilised by ground vehicles or it is uneconomic to do so. Also it needs to be recognised that some properties have been historically run very conservatively with little or no fertiliser usage.

Finally, availability of stock water is often limited because of the uncertainty of the climate, low rainfall, unreliable creek flows and reliance upon farm dams. This fact, together with the (often) large size of paddocks and set stocking grazing regime means that there are areas within paddocks on the Monaro which receive infrequent grazing especially those at considerable distance from the water source. Experience suggests that such areas may support native grasslands of inherently higher quality with a higher incidence of kangaroo grass for this reason.

For the reasons previously described it is apparent that those areas of the landscape and property which have had the least grazing pressure and have also had very little or no application of fertiliser have the highest likelihood of still supporting kangaroo grass based high quality native grasslands. This is consistent with the research and findings previously outlined.

Technique

1. Kangaroo Grass Identification

As mentioned previously, Kangaroo Grass has a highly distinctive appearance and even isolated plants of Kangaroo Grass plants really "stand out" in the landscape during January to March (especially after summer rainfall) as well as during winter.

Skills in the identification of Kangaroo Grass can be easily and simply learnt by all landholders in a very short period.

2. Location

Focus your search on the more remote parts of the property and areas of the paddock which are the more distant from water, shade and shelter where stock infrequently graze and grazing intensity is lowest. Focus upon paddocks and locations within the paddock which are inherently poorer soils of low fertility or those areas which have received limited or no fertiliser and little history of disturbance. In doing so it needs to be appreciated that even isolated plants of Kangaroo Grass plants really do "stand out" in the landscape during January to March (especially after summer rainfall) as well as into winter.

3. Plant Density

Kangaroo Grass is such a useful indicator species that finding only scattered or individual plants is sufficient to earmark this paddock, site or patch within a paddock as being worthy of managing for its conservation significance. In other words, a simple "presence or absence" of Kangaroo Grass is sufficient.

Understandably the higher the level of ground cover and the greater the plant density or abundance the better is the conservation value of this grassland site especially if it is associated with other native plants and herbs which contribute to species richness and floristic diversity.

However the aim of the Strategy is to identify the higher quality grasslands worthy of protection as evidenced by the presence of Kangaroo Grass – even at low levels – and not to differentiate necessarily between various condition threshold categories.

4. Management

It is the aim of the Strategy firstly to identify – initially via the presence of Kangaroo Grass – those few remaining remnants of good native grasslands and then to protect them into the future.

A more comprehensive management approach to achieving this outcome will be developed alongside this Strategy. However, simply it will involve periodic exclusion from grazing - especially in spring (perhaps with exclusion fencing), no fertiliser application and most importantly a planned weed control program to remove and prevent the incursion of weeds especially the noxious perennial grass weeds Serrated Tussock and African Lovegrass as well as St John's Wort.

The larger such areas the better the conservation outcome.

It is needs to be appreciated that the protection and management of these high conservation native grassland sites needs to be seen in a whole farm context. Increases in agricultural productivity should be directed to those areas and land classes of the property which are agronomically and economically better suited to this purpose. The significant increase in stocking rate from the sowing of well managed, "improved" pastures will substantially offset the very small reduction in stocking rate from caring for these high quality native grassland sites.

Experience also suggests that these few remaining remnants of Kangaroo Grass based high conservation sites are usually some of the less productive agricultural land or are practically more difficult to manage and therefore the economics of "improving" them is questionable.

A further necessary consideration relates to the need for a buffer zone. A buffer zone is a contiguous area immediately surrounding or adjacent to the Kangaroo Grass based high conservation grassland site. The purpose of the buffer zone is to help protect and manage the ecological community. The edges of a patch are considered particularly susceptible to disturbance and the presence of a buffer zone is intended to act as a barrier to further direct disturbance. There is no specific size of the buffer zone. However, like the high conservation patch or paddock of Kangaroo Grass, the larger the size the better. Also there is a high likelihood that this adjacent or surrounding buffer zone area may be a medium conservation native grassland which over time may be enhanced. Another important consideration or course relates to the practicality of actually fencing the site.

It must be emphasised that the preceding discussion relates to Kangaroo Grass based native grasslands of high conservation value. A recommended management approach for native grasslands of medium conservation value will also be developed as a key component of this Strategy. This will involve enhancing the conservation of these paddocks and sites while also undertaking sustainable grazing such that it becomes a win/win for both conservation and agricultural production.

Identification of Low and Medium Conservation Value Grasslands

The principal focus of this Strategy is upon the identification and protection of those few remaining paddocks and patches of high conservation native grassland.

At the same time however there is a need also to be able to identify those areas of native grassland of medium conservation value and those of low value.

It needs to be emphasised that any attempt to come up with a foolproof guide or definition about what constitutes a native grassland of high, medium or low conservation value – and therefore to differentiate between a “native grassland” and “native pasture” - is fraught with a high risk factor and will be open to criticism.

This is confirmed by ecologist John Benson from the Royal Botanic Gardens and author of “The Native Grasslands of the Monaro Region” who advises “it is perhaps impossible to come up with definitions which are legally foolproof.” (Benson 1996).

Similarly Carter et al (2003) suggest that “the term 'Natural Temperate Grassland' is itself merely a label or, at best, an imperfect summary of the vegetation community. The individual components of the label, ie 'natural', 'temperate' and 'grassland', are each imprecise and open to individual interpretation”.

Despite these frank acknowledgements, it is apparent that the regulatory approach to native grassland management has tended to focus upon the development of complex assessment criteria and precise definitions to determine the conservation status.

For example, “the Floristic Value Score is a method of measuring the quality of a grassland site” (Commonwealth of Australia 2016). It has been described as being “a useful method for actually defining the conservation status; used as a key component of the methodology for determining thresholds under the EPBC Act”; but that it, “requires very high skills in plant identification well in excess of the ability of landholders.”(D Hazell, 2013, pers.comm.).

As mentioned previously, such an outcome is not the purpose of this Strategy. Rather, it is to help landholders - often with limited botanical skills in plant identification- to proactively assess and moreover be able to differentiate between grasslands of different broad conservation categories and to manage them accordingly.

Put succinctly, its purpose is “to find not to de-fine” those (approximately) 100 000 ha of native grasslands worthy of protecting and conserving.

Despite this, there is nevertheless a need to derive a broad description of what constitutes a low, medium or high value grassland in order to develop and implement appropriate management practices either to enhance their conservation status (as with moderate) or to be earmarked for increases in agricultural productivity (low).

For example, the regional publication Managing Native Pasture for Agriculture and Conservation (Langford et al 2003) divides native pastures/grasslands into three broad categories according to

species composition, structure, condition and management history. The broad categories described include: native grasslands; modified native pasture; and highly productive pasture.

According to the Southern Rivers Catchment Management Authority (2005) “these 3 pasture types are not clearly defined or mutually exclusive, but broad, overlapping zones along a continuous gradient of modification states. This species composition gradient is defined at one end by unaltered natural temperate grassland, with its originally dominant native grasses and a rich diversity of other herbaceous species, and at the other end by highly productive native pastures dominated by different native grasses that were not the main species in the original native vegetation, and with a much lower diversity of other native species. These end points are more conceptual than real, so the vast majority of native pastures are positioned somewhere along the gradient between these end points. All native pastures (in this region) can be seen as lying somewhere along this gradient”.

This thinking is reinforced in the following description:

“Within any particular property, locality or region, remnant grasslands exist along a continuum of condition states. At one end of this continuum, there are the rare sites with a high degree of integrity (i.e. a very high floristic diversity, varied structure that provides habitat for a diverse fauna, and low or absent exotic plant cover). At the other end of this continuum are the more extensive areas described variously as native pasture, degraded grassland or highly modified grassland. Sites in these categories variously have a very low native plant diversity, limited fauna habitat values, and often a high cover and diversity of exotic plant species, many of which are either agricultural or environmental weeds.” (OEH 2006).

The Office of the Environment and Heritage further describes these grasslands as being comprised of disturbance tolerant native species that “do not warrant the same level of protection as high-conservation-value grasslands” (OEH 2012).

It is evident from the preceding descriptions that attempts to derive precise definitions are fraught with error.

Nevertheless Benson (1996) attempts to categorise between native grasslands and native pastures.

According to his definition, native grasslands are grasslands where greater than 50 % of the vegetative ground cover is comprised of indigenous species of grasses and forbs (ie pre European); greater than 50 % of the number of species are native and where the minimum vegetation standing ground cover alive or dead exceeds 10 %.

Conversely native pastures are defined as grasslands that contain both native and introduced species; where the introduced species are dominant ie they comprise above 50 % but below 75 % of the species present and cover which is greater than 50% but less than 75 % of the area.

It is noteworthy that Benson states: “*This is the key definition which should apply to regulations on clearance control as it covers all native grasslands whether they are natural, derived or occur as an understory in a woodland.”*

For this reason it is used as the basis of this Strategy, taking into account his previous precautionary warning that "*it is perhaps impossible to come up with definitions which are legally foolproof."* (Benson 1996).

Assessment Methodology

Various approaches have been investigated to determine the conservation status of native grasslands. The Southern Rivers CMA in particular explored a range of options with a focus upon those native pastures of low conservation value. Invariably however, and despite the concerted efforts of a range of committed professionals, there remains a question mark over the capacity of landholders to undertake such assessments which still require a level of botanical expertise higher than that possessed by most.

In doing so it is prudent to revisit one of the best practice management guidelines of native grasslands: "native grassland conservation programs should aim to address the protection of sites that are the highest priority for conservation in the region" (Ross 1999).

The methodology to be used in this Strategy is based upon the recommended approach by John Benson above. However it also takes into account a number of factors which have also been identified as part of the assessment and identification of low quality grasslands.

Step 1 Preliminary Assessment: Is the paddock native or introduced / exotic?

Undertake an assessment of plant composition (in terms of ground cover) within a paddock or site under question using the recommended rod-point technique (Little and Frensham, 1993). This technique is also outlined in Fact Sheet 5 "How Can I Manage Monaro Grasslands (Southern Rivers CMA 2003).

This technique is simple and straightforward, takes little time and can be undertaken with confidence by all landholders. Its fundamental purpose is to differentiate between a native and an introduced or exotic pasture.

This assessment should be undertaken when the greatest number of species are present and able to be identified within the paddock or site. On the Monaro this is early spring when the pasture is relatively low to the ground which assists in the identification process. All plants should be assessed including perennial and annual, native and exotic, grasses and broadleaf plants (Southern Rivers CMA 2005).

If the percentage cover of introduced plants is greater than 50 % the paddock is described as being exotic (introduced).

(Exotic Grassland: "Grasslands where all or the vast majority (> 75 %) of species are introduced into the area and all or most >75 % of the canopy cover is composed of introduced species, and where all or most of the indigenous vegetation has been removed" (Benson 1996).

Step 2 Native Pasture or Native Grassland: Low versus Medium conservation value

If the site has greater than 50 % ground cover of native species there is a need to undertake a further assessment.

The objective in this approach is to differentiate between what is a low conservation native grassland – which is more aptly described as a *native pasture* – and a native grassland. Again the emphasis is upon differentiation not definition for the purpose of achieving the overall goal of this Strategy.

A low conservation grassland or 'native pasture' in this Strategy is defined as one which: "has more than 50 % native ground cover and which has more than 50 % of introduced species present (including annuals and perennials) . It may be dominated by only a few (up to 4) perennial native grasses and has little or no floristic diversity of native forbs.

(This description is derived from a number of sources including Benson (1996), "Native pastures are defined as grasslands that contain both native and introduced species where the introduced species are dominant ie they comprise above 50 % but below 75 % of the species present and cover which is greater than 50% but less than 75 % of the area"; the Southern Rivers CMA; together with the following description, "A low conservation grassland is one which is dominated by native species – mostly snow grass, spear grasses and wallaby grasses and where there are few or no native forbs; some exotic grasses may be present".

It is also consistent with an actual account of the Monaro environment, "Although at most sites the bulk of the vegetation is comprised of a small number of dominant native species, there is now an abundance of introduced annual species." (Benson 1994).

By contrast, consistent with the broad approach in this Strategy, those grasslands which do not meet the (above) description of a low conservation value native "pasture" are therefore grasslands of medium (or high) conservation value. These grasslands are in essence of high quality which retain a diverse range of native species including both grasses and forbs but lack the presence of Kangaroo Grass as a surrogate of a native grassland with greater species richness and associated floristic diversity. They also are characterised by having relatively few "disturbance increasers" – including both native and introduced - because they have been subjected to lower levels of disturbance or degradation then low quality native 'pastures' but more than the native grasslands of high conservation value. Because of their inherent better quality and lower levels of disturbance it is recommended that such sites should be managed to enhance their conservation value.

Such sites and paddocks are well represented throughout the Monaro (in the order of 90 000 ha).

In terms of definition, Benson (1996) describes medium quality native grasslands as: "grasslands where greater than 50 % of the vegetative ground cover is comprised of indigenous species of grasses and forbs; and greater than 50 % of the number of species are native". It is useful to juxtapose this definition alongside that for the low conservation.

Note: Whereas under the previous assessment technique plants were categorised or grouped together simply as being either native or non-native (introduced/exotic), under this procedure there is a need to be able to identify the various plants which are present or at least to discriminate

between species and to know if they are native or not. At this stage, however there is a need only to have rudimentary skills in plant identification. However there is a need to able to distinguish between a native plant and one which has been introduced (and which may be either “desirable” or a “weed”).

This is especially relevant in terms of being able to distinguish the low from the medium.

Again - like the approach used for the identification of Kangaroo grass based native grasslands of high conservation value - the purpose of this approach is not to be able to accurately define the botanical composition or ecological integrity of the grassland. Rather it is designed to be able to differentiate between the two with a specific focus upon the lower conservation category.

While the ideal situation is for landholders to be able to have the skills to identify all of the native plant species - an approach which forms the basis of the floristic score index (floristic value assessment) - it is considered that this is well beyond the reach of most landholders. For this reason it is suggested that where necessary landholders are encouraged to seek professional assistance especially when there is uncertainty in differentiating between medium and low condition grasslands.

It is also considered essential for landholders to have the skills in identification of introduced species including especially weeds. This requirement is important because introduced species can be used as indicators of a modified or degraded grassland in the same way that Kangaroo Grass is used as an indicator of a high quality grassland. At the same time, of fundamental importance to the development of an integrated approach to pasture (and weed) management is having the skills to identify the various individual pasture components. This includes both “desirable” species (including both native and introduced species) as well as weeds (including annual and perennial weeds, grasses and broadleaf weeds, and “noxious” weeds) (Burton and Dowling 2004). By describing and assessing the various individual components of a pasture (native or introduced, desirable and non-desirable), and through establishing a target or “ideal” species composition for that specific pasture or site, it is possible to implement an integrated approach using a range of management tools to reach that target.

Such an approach is confirmed in the following: “When documenting the flora at your site, it is important to include an assessment of the abundance and distribution of exotic plants, as well as overabundant or out-of-place native species. It is important to understand the weed species present, and their distribution and threat to the grassland, in order to establish effective and targeted weed management programs. It is also important to note that some weed species can provide habitat for native fauna.” (Sharp et al 2015).

The methodology to be used is as follows:

Using the same rod point technique or by thoroughly traversing the paddock, each individual species is recorded under the two broad categories of native and introduced including its frequency of occurrence. If the total number of exotic (introduced) species is greater than the number of native, and despite the fact that it has already been assessed as having more than 50 % ground cover of native species, this paddock is assessed as having a high probability of being a low conservation grassland.

Conversely, if the number of native species is greater than the number of introduced species, but these are dominated by only up to four species of perennial native grasses and few species of forbs - and despite their frequency of occurrence - it is evident that the site lacks “species richness” or “floristic diversity” and therefore in all likelihood can be considered a low conservation grassland site.

By contrast, if however the paddock has more than 50 % native species with a high number of species of native grasses and forbs it is evident that it is has a high probability of being a “medium” quality grassland. That is, such a site has greater than 50 % ground cover of native species but also exhibits a high level of species richness and diversity.

It is noteworthy that experience suggests that in most situations the difference between paddocks of low and medium conservation significance is usually quite marked. This can be related to the fact that another attribute which should be taken into account when assessing grassland condition is the “integrity” of the paddock or site. That is, how badly disturbed the site has been, how many weed species are present and their distribution (Rehwinkel 1999). This thinking reinforces the approach as outlined previously by the Southern Rivers CMA (2005) which suggested the need for “a farmer-friendly assessment technique based on history of disturbance, which could run parallel to the ‘Site Assessment Guidelines’, to enable landholders to assess the likelihood of grassland being native pasture or a native grassland”.

Low conservation sites are mostly those which may have been subjected to a long history of grazing together with possibly the application of fertiliser and the introduction of exotic species. This has led to a decline in the number and diversity of native plant species, the dominance of a few coloniser native species and the possible invasion of exotic plants and/or weeds. In extreme cases, such paddocks may have been subjected to some form of physical or environmental disturbance (ie severe drought coupled with overgrazing; cultivation) which has further contributed to their degradation.

This situation is summarised accordingly, “The grassland communities on the Monaro have been substantially modified since European settlement. Exotic species comprise over 35 % of the flora in most places. It appears that many native plants have been eliminated or replaced in abundance through a history of grazing, competition with weeds and perhaps by altered fire regimes.“ (Benson 1994).

The historic effect of drought(s) should not be overlooked in terms of its degrading influence on the landscape and the decline in the ecological integrity of the native grasslands and especially upon Kangaroo Grass. To put this into perspective, one of the first pastoralists Richard Brooks brought cattle onto the Monaro in 1827, “the year of severe drought”. Similarly, it is my personal opinion that the prolonged (47 consecutive months) drought from late 1979 to 1983 was the “tipping point” in terms of the explosion of Serrated Tussock as a major weed problem in the region.

It is worth mentioning that Monaro landholders themselves as part of the Monaro Grasslands Management Plan developed the concept of a ‘Land Use Assessment Sheet’ as part of the process of assessment of “conservation value”. Under this approach a paddock is scored according to its disturbance history which takes into account such management factors as: physical disturbance (ie cultivation, pasture establishment, direct drilling); introduction of exotic species; amount and

frequency of fertiliser application; weed presence and herbicide usage. Consideration was also given to the grazing regime and intensity as this affects changes to a grassland community.

It is suggested that this concept has considerable merit in terms of the ability to discriminate particularly between sites of low disturbance - and hence higher conservation - and those with a high disturbance history which are more likely to have little or no conservation value.

It is also an extremely useful tool for preliminary screening of a site or paddock before undertaking a botanical assessment and therefore is complementary to the methodology outlined in this Strategy. One further significant benefit of this approach is that it can readily be undertaken by all famers.

Because the 'Land Use Assessment Sheet' is believed to have considerable merit in the determination of the conservation status of native pastures and grasslands (as suggested by the Southern Rivers CMA) it will be further investigated and developed as a possible component of the extension campaign associated with this Monaro Kangaroo Grass Strategy.

An important corollary to the concept of 'degradation' is the re-establishment of native grasses into previously sown "improved" pastures. It is well recognised by landholders throughout the region that areas of sown pasture quickly become reinvaded with native grass species including most especially Spear/Corkscrew grass (Austrostipa spp), Wallaby Grass (Rytidosperma syn Austrodanthonia) and Poa 'Snow' tussock (Poa sieberiana) despite implementing sound agronomic practices. This is related to the (high) level of seed reserves in the soil together with their inherent adaptability to the Monaro environment. Such species are referred to as "colonisers" (Commonwealth of Australia 2016).

James Litchfield, whose family are highly regarded multi-generational landowners on the Monaro since 1852, and who personally commands enormous respect because of his insight and balanced approach to agriculture and the environment, is of the opinion that the reinvasion of native "coloniser" grasses into sown "improved" pasture on the Monaro is "inevitable" (James Litchfield pers. comm.). This is confirmed from personal experience as an experienced agronomist as well as by numerous landholders throughout the region.

There is a high likelihood that such pasture paddocks will have greater than 50 % ground cover of native plants – albeit dominated by only 2-3 species – but with more than 50 % of the total species number being exotic. Undoubtedly such paddocks are of a low conservation status.

It is clearly apparent therefore that the inevitability of native grasses re-invading sown pasture within, say, a 10 year period, together with the fact that it is only possible to sow in the order of 60-70 % of a paddock, must be taken into consideration within the context of native grassland management.

This situation is best summarised by the Office of the Environment and Heritage (2012) who state: "native grasslands with a history of periodic cropping, pasture improvement, fertiliser application or certain grazing management practices are typically of low conservation value. These grasslands often support only those native species that are able to tolerate disturbances; they do not warrant the same level of protection as high-conservation-value grasslands".

"Much of the trial work on grassland assessments has been undertaken on paddocks which have had full removal of native species (via cultivation or chemical application) followed by establishment of a range of exotic grasses and legumes and subsequent intensive grazing pressure. It has been observed that within 10 years (and often within 5-7 years) virtually all these paddocks have been recolonised by native species such that they have greater than 50% groundcover (and often up to 70% groundcover) of native species. This reflects the highly aggressive colonisation abilities of the native Stipa and Poa Species. In essence, 10 years after clearing, greater than 90% of improved pastures have returned to be low conservation value grasslands" (OEH 2012).

The highly invasive capacity of some native species as a consequence of the degradation of the original native grasslands over the past 180 years of grazing and agriculture is similarly confirmed repeatedly in the literature.

For example: "Changes in species composition and loss of floristic diversity are two of the significant changes that occur in heavily grazed grasslands. On the Monaro, for example, speargrasses have probably replaced more palatable species such as Kangaroo Grass as they were grazed out. Speargrasses now dominate many native pastures on the Monaro. Perennial grasses such as Red Grass, Snow Grass, wallaby grasses and speargrasses become more prominent as grazing intensity increases. Decades of pasture improvement have contributed to substantial changes in the floristic composition of Natural Temperate Grassland." (Environment ACT 2005).

And again: "Certain native grasses such as spear-grasses, wallaby-grasses, tussock-grasses and wire-grasses are less palatable or more resistant to grazing pressure than Kangaroo Grass, and tend to become more dominant under some grazing regimes. This explains the dominance of these plants in areas that were previously dominated by Kangaroo Grass" (Barlow 1998).

Area and Extent of Native Grasslands

One of the greatest challenges in any investigation or review of the native grasslands of the Monaro region relates to providing accurate reliable estimates of the area and extent of the native grasslands both at the time of European settlement as well as those remaining today.

This is further complicated because at the time of European settlement, native temperate grassland was widespread as part of a woodland-grassland mosaic (Environment ACT 2005). However, lack of knowledge of the characteristics of this mosaic means that an accurate assessment of the area of natural temperate grasslands prior to European settlement is not possible.

It should be acknowledged also that this problem and challenge continues today when attempting to assess the current extent of grasslands due to the altered woodland- grassland mosaic as a consequence of tree removal together with confusion over what actually constitutes a "grassland" as opposed to a "grassy woodland" (that is, when the ground cover of trees exceeds 10 % the community).

This challenge is further exacerbated when the quality of those native grasslands in terms of their species composition is taken into consideration, which is one the principal objectives of this Strategy.

It needs to be appreciated too that while the primary focus is upon the total area of the various categories of native grassland - both pre-settlement and today - there are further considerations which must be taken into account. These relate to the actual size of the parcels of land which remain and their ecological status.

Taking the preceding caveats into account it is possible to make the following assertions in relation to the native grasslands of the Monaro:

It is estimated that at the time of European settlement there were 250 000 ha of native lowland grassland on the Monaro (Benson and Wyse-Jackson 1993). At the same time it is also suggested that the full extent of the natural temperate grasslands of the southeast highlands bioregion is in the order of 480 000 ha (Burge 2018; Commonwealth of Australia 2016). Note: This refers to the naturally treeless grassland which may contain very sparse trees or shrubs (up to 10% projective foliage cover) (Environment ACT 2005) and not the grassy woodlands.

Determination of the area and full extent of the native grasslands plus native pastures which remain today is similarly challenging.

For example, according to the ABS, in 1994 the 'total area of pasture' (that is, the area used for grazing) on the Monaro was 537 000 ha.

In 2005/06 ABS statistics indicated that the total area of "grazing land" was 607 049 ha (as opposed to 702 965 ha for the total area of private land).

In 2013, the total area of grazing was assessed to be 715 000 ha (based on Cardno 2013 'Compilation of Statistical data for South East Catchment Action Plan').

Aerial survey and modelling work undertaken during 2003-2007 as part of the Monaro Grasslands Modelling Project indicates the full extent of the grazing lands on the Monaro to be 658 000 ha.

Because of differences in data collection and the inherent inaccuracies associated with each, it is considered that an average of these is appropriate as the basis of this Project. That is, the total area of pastures used for grazing on private land (including native grasslands, native pastures and exotic or "improved pastures") on the Monaro is in the order of 630 000 ha.

Sown versus Native Pasture

The relative role and importance of introduced versus native pastures is best summarised accordingly:

"Many farmers on the Monaro have a balance of exotic and native pasture on their properties. This is partly due to the complementary benefits offered by native and exotic pastures, the cost of pasture improvement and maintenance and also because many areas are unsuitable for exotic pastures" (Ross 1999).

The most comprehensive analysis undertaken of the pasture base of the Monaro was conducted in 1994 by Stuart Burge (author of this Report).

This investigation found that the combined area of native grasslands/pastures represented at that time 67 % of the total grazing area of the Monaro which he describes as being “the backbone of the grazing industries”.

This work also indicated that “unimproved, unfertilised native grasslands” represent 20 % of the total area of native grasslands and that fertilised, semi-improved (through the addition of subterranean clover) native pastures were the remainder.

It is believed, and in the context of this Strategy, that this 20 % is indicative of those grasslands of moderate conservation value while the balance is either a small percentage of high conservation grassland or is modified native pasture of low conservation value. Such as an assertion is consistent with the previous descriptions in this Report.

It is noteworthy that this finding and commentary also aligns with that of Powells et al (2013): “In the Monaro region of NSW, 70% of pastures are based on native species and are the cornerstone of livestock production.”

Because of this close correlation, for the purpose of this Strategy it has been decided to use the figure of 70 % being native and 30 % sown pastures.

On the basis of a total area of 630 000 ha, this represents an area of 440 000 ha of native and 190 000 ha sown pastures.

It is noteworthy that an audit of the feed-base in Australia conducted in 2011 (Donald and Burge 2012) indicated that 26.6 % of the pastures on the Monaro were classified as being “in decline”. That is, they were suffering from degradation as indicated by change in botanical composition, loss or change in species, increasing bare ground or weed invasion.

Area of High Conservation Value Native Grasslands

As mentioned previously, one of the greatest challenges of this Strategy is to determine the conservation status of the remaining grasslands and the area of each which exists today on private land. This is especially in relation to the high conservation sites.

It is noteworthy that it was stated as early as the 1950s that nowhere on the Monaro had the original grassland been found structurally and floristically intact (Threatened Species Scientific Committee 2016).

This belief is confirmed by Rehwinkel (2003) who suggested that no pristine examples of the endangered Natural Temperate Grasslands of the Southern Tablelands ecological communities are known to exist and high quality sites of endangered ecological communities are rare.

Despite this recognition of the rarity of high quality sites, there is a consensus of opinion that the total area of high quality grasslands which remain today is in the order of 3 % of the original extent (Burge 2018).

For example, “it is believed that the current total area remaining of native grassland in high ecological condition is unknown but estimated to be in the order of 3 % of that at the time of European settlement (Environment ACT, 2005; Threatened Species Scientific Committee 2016).

This is similarly confirmed in the following which also emphasises the importance of Kangaroo grass as an indicator species: “Kangaroo grass is one of the largest tussock grasses in the natural temperate grassland of the southeast highlands ecological community , and is the structural dominant of most of the vegetation associations of natural temperate grasslands throughout its range, and this species has been lost in all but an estimated 3% of the community that remain in states that approximate the high to very high and excellent condition threshold criteria” (Commonwealth of Australia 2016).

If the full extent of the natural temperate grasslands of the southeast highlands is taken into account (470 000 ha), 3 % of this represents in the order of 15 000 ha (Burge 2018).

Despite this, Williams and Morgan (2014) assert that, “based on the information provided by the Endangered Species Scientific subcommittee 2000 the current extent of the natural temperate grasslands is 5 800 ha out of the original 470 000 which represents a decline of 98.8 %”.

Focussing specifically upon the Monaro, the extent and severity of the reduction is reinforced in the following, “On the Monaro over 95% of native grasslands (ie those present before European settlement) have been destroyed or highly modified, leaving few sites in a condition resembling their pre-1750 state (Carter et al 2003).

Summarising, if we use the more common consensus figure of 3 % remaining, and working on the basis that, according to Benson and Wyse-Jackson (1993) “it is estimated that at the time of European settlement there were 250 000ha of native lowland grassland on the Monaro and that only a small fraction of these grasslands remain in natural condition,” this represents an area of 7 500 ha.

The bottom line is that the area of high quality native grassland or natural temperate grassland which resembles that at the time of European settlement on the Monaro is unknown; is severely depleted but is estimated to be in the range of 5 800 to 7 500 ha.

Patch Size

While the previous focus has been upon the total area remaining of native grasslands, there is also a need to consider the actual size of the parcels of land which remain on private land. It needs to be appreciated that that the high quality ecological community that remains today is found mostly as islands or “very small, fragmented patches and most are less than 10 ha in size.” (Commonwealth of Australia 2016).

This is an important consideration and confirms the reality that the 5 800 - 7 500 ha of native grasslands of high conservation value which exist today are rare and scattered throughout the landscape as isolated paddocks, or small pockets and patches. This is consistent with the discussion provided in the Background to the “Location of Kangaroo Grass Based Native Grasslands of High Conservation Value” in this Report which provided rationale as to why this is the case.

This confirms too the enormity of the challenge to locate these sites on private land. It also reinforces the absolute need to proactively engage with landholders on whose properties they are located.

This necessity should be seen within the context of the best practice guidelines for conservation management for native grasslands which highlights that "the community - that is, landholders - should be closely involved in the development of all strategies as many of the actions will either be performed by them or require their support." (Ross 1999).

It needs to be emphasised that this Kangaroo Grass Strategy is primarily focussed upon private land. The presence and importance of high conservation native grasslands on public land is well recognised and regarded as being critically important to the preservation of this threatened ecological community:"Natural Temperate Grasslands of the South East Highlands typically now occurs in less disturbed remnants, with the best examples occurring in country cemeteries, travelling stock reserves and roadside reserves. Roadside reserves are often very diverse, but are usually very small and are, by their nature, linear. Very good examples are also retained on several Crown land and other government managed sites".

Cemetery: Source: EMR Project Summaries / Greening Australia

"Natural Temperate Grassland has also been retained on private grazing lands, where fertiliser application, cultivation and pasture modification have not been applied and grazing pressures have been minimal. Such sites that are retained on private grazing lands are typically the largest examples remaining." (Commonwealth of Australia 2016).

Area of Medium Conservation Value Grasslands

As mentioned previously there are in the order of 440 000 ha of native grasslands/pastures on the Monaro and of these 20 % or approximately 90 000 ha are described as being of moderate conservation value.

This figure is consistent with the estimate of ecologist David Eddy who suggests that, from personal experience, the area of moderate conservation value grasslands on the Monaro is between 10 and 20 %; the area of high conservation grasslands is 5 %; and that the balance (ie 75 – 85 %) has been substantially modified and is low conservation (Eddy pers. comm.).

It needs to be emphasised that one of primary goals of this Strategy and consistent with the stated aims of grassland management as outlined by the Southern Rivers CMA (2005) are:

- "to protect and improve the values of medium conservation value grasslands so that conservation /connectivity areas comprise 20% of the landscape, whilst still supporting appropriate grazing

- to improve the management of medium conservation value grasslands so they are better able to sustain appropriate grazing while contributing to the ecological viability of the Monaro grassy ecosystems."

It is also worth noting that a further aim as described by the CMA was "to enable the conversion of low conservation value native pastures into intensive production areas by use of pasture improvement (including fertiliser application and introduction of exotic pastures and crops)."

Area of Low Conservation Value Grasslands

From the preceding discussions it is evident that the area of native "pastures" of low conservation value out of the total area of 440 000 ha is 342 500 /ha.

Summary

Total Area Grazed Land on the Monaro: 630 000 ha

Total area of exotic pasture: 190 000 ha

Total area of native grassland + native pasture: 440 000 ha

Area of High Quality Native Grassland (Natural Temperate Grassland): 5 800 to 7 500 ha

Area of Medium Quality Native Grassland: 90 000 ha

Area of Low Quality Native Pasture: 342 500 ha

The Impact of Weeds on the Monaro Native Grasslands

The single greatest threat to the conservation of the native grassland ecological community on the Monaro is the threat of the highly invasive perennial grass weeds Serrated Tussock, African Lovegrass and Chilean Needlegrass. The urgency of the need to act in controlling these weeds is now at a critical stage which, if not adequately addressed, will result in their permanent decline (Burge 2018).

Much has been written and stated over many years about the impact and invasive threat of these noxious perennial grass weeds not only upon the environment and our natural resources but also upon agricultural production.

This is best described in the following comment from the Southern Rivers Catchment Management Authority in 2012:

“Unfortunately the Monaro has a well established population of the highly invasive grassland weeds African Lovegrass (E. curvula). This weed is a C4 grass which is predicted to become increasingly competitive with lower and more unreliable rainfall and increased drought periods in the future.”

“The other major threat to the ecology of the Monaro Grasslands and the primary production systems that they support is serrated tussock.”

“Unless a large-scale, early investment is successfully implemented, the long term prognosis for the Monaro is one where through inappropriate grazing management and the effects of recurring droughts African Lovegrass will have dominated the native grasslands *resulting in the irreversible degradation of their ecological value*” and an estimated decline in production (through the loss of grazing productivity alone) of 40 % for African Lovegrass and an almost total loss with serrated tussock.” (Southern Rivers CMA 2012).

African Lovegrass Invading Kangaroo Grass HCV Source: Natural Regeneration Australia

It is noteworthy that since that sobering observation the severity and extent of African Lovegrass in particular has escalated significantly in the past 5-6 years. This has coincided with a period of above average summer rainfall which has been especially advantageous to its growth. The weed also exhibits a range of other physiological characteristics which enable it to compete aggressively with most other plant types including both native and introduced species.

The alarming spread African Lovegrass – and therefore the severity of the risk imposed upon the preservation and conservation of the native grasslands (as well as agriculture) – is highlighted by the following historic information in relation to the level of infestation and number of properties affected.

In 1986, data compiled by Stuart Burge, and based upon a survey of shire weeds officers, found that in the Bombala shire the level of infestation of African Lovegrass was described as being 'low' with no (nil) properties affected and "only scattered plants along roadsides". It is noteworthy that the following comment was made: "If these weeds were left and nothing done they would soon become a major problem ….." The full annual cost of weed control at that time was $ 500 for roadside weed spraying.

A similar relatively "clean" scenario was evident within the Snowy River shire in which the degree of infestation of African Lovegrass was also categorised as being 'low' with only 8 properties affected and the total area affected being 150 ha with scattered plants.

Not unsurprisingly the Cooma Monaro Shire supported the highest infestation of all three shires. In 1986, a total of 200 properties were recorded as having African Lovegrass extending over 10 000 ha. At that time, 1000 ha were described as supporting a heavy infestation; 2000 ha as medium; and the remaining 7000 ha were described as being low with only scattered pants requiring spot spraying. The most startling comment in relation to the weed status was that "plants of all these weeds (African Lovegrass, St John's Wort and Nodding Thistle) are on the decrease ….."

It is noteworthy that correspondence from the Bombala Rural Lands Protection Board in 1991 under the heading "African Lovegrass on the Monaro" quotes District Agronomist Stuart Burge as stating that he was "very concerned about the spread of this invading weed considering it to be worse than serrated tussock."

The gravity of the situation is highlighted when these "baseline" figures from 1986 are compared with the extent of Lovegrass today. Brett Jones, Biosecurity Manager for the Snowy Monaro Regional Council (2018 pers.comm.) estimates that currently 20 % or approximately 100 000 ha of the Monaro now has a heavy infestation of African Lovegrass and that 50 % of the region is considered to be "at risk". This finding and observation provides clear and irrefutable evidence to validate the previous warning from the Southern Rivers CMA (2012) in relation to the threat of African Lovegrass (as well as Serrated Tussock) to the ecological value of the native grasslands. It also emphasises the invasive capacity of this weed when consideration is give to the extent of the infestation today compared to the situation in 1986.

It needs to be clearly recognised and understood that the rapid escalation of African Lovegrass over the past 30 years is not related to the lack of information or suitable control options. There are registered effective herbicides together with numerous farmer advisory information sheets. Furthermore, there has been a considerable amount of research undertaken on this weed and it has been the subject of much regional weed management planning.

Rather, it is the opinion of the author of this Report and based upon considerable personal experience that the dramatic increase in the problem is related to a combination of: education in relation to its identification and potential invasive risk; extension of the appropriate control methods; a lack of appreciation of the capacity of this weed to spread at such a rapid rate; a decline in the number of on-ground advisory and regulatory support staff; together with the inherent physiological capacity of the weed itself.

It needs also to be acknowledged that the problem of African Lovegrass has to be seen in the context of the arguably larger problem of Serrated Tussock which has been almost endemic throughout much of the Monaro over a much longer period of time. Serrated Tussock has historically been recognised as the major weed problem in the region and has understandably been the main focus of control efforts for over 50 years both by landholders on farm as well as community groups such as Landcare, state government agencies (including NSW DPI and CMA's) and shire council weed authorities.

For this reason it is suggested that the one of the main reasons for the spread of African Lovegrass is related to the fact that the focus of weed control programs during the 1980's and 1990's was so much centred upon Serrated Tussock, together with the reasons outlined previously, that African Lovegrass effectively "snuck up behind our back" and then literally "erupted overnight".

The severity and extent of Serrated Tussock is evident from the following data from 1997 after more than 20 years of concerted and concentrated control effort by landholders, government and shire weed authorities. A survey conducted in 1997 by the CRC for Weed Management found that on the Monaro the total area of infestation of serrated tussock was estimated to be 163 936 ha. This was comprised of: 34 881 ha supported a 'heavy' infestation of Serrated Tussock; 56 270 ha carried a 'medium' infestation; and 72 785 ha light (Jones and Campbell 1998).

To put this into context in terms of this Strategy, and assuming that most of this problem will be found on the non-arable native country, 37 % of the native pasture on the Monaro carried a serrated tussock problem in 1997. The extent of this problem is expected to be worse today (Jones pers. comm.).

Irrespective of the actual figures today, it is clearly apparent that the combination of these two noxious perennial grass weeds represent the single greatest threat to the preservation and conservation of the Monaro native grasslands. Both of these weeds are now established almost ubiquitously across the landscape and they both possess physiological characteristics which contribute to their invasive capacity. Serrated tussock seed is able to be wind-borne over large distances and therefore can spread rapidly under suitable conditions (eg drought) while African Lovegrass is a highly competitive and invasive plant which is well adapted to the Monaro environment. Together, the cost and practicalities of control are large and burdensome.

Any control program into the future MUST take these realities into consideration.

It needs to be clearly understood that the clock is ticking in terms of the preservation and conservation of the high and medium quality native grasslands on the Monaro. Weed control policy must therefore acknowledge this fact and facilitate the use of the most efficient, cost effective and timely control programs.

It is worth contemplating whether legislation and regulatory control in terms of the management of the Monaro native grasslands is a hindrance or impediment to allowing famers to adequately control these weeds and therefore may well be hastening the irreversible degradation of the ecological value of this highly endangered community.

A further recent compounding issue in relation to the control of these weeds and therefore to the threat to the native grasslands has been the alarming increase very recently in the resistance of Serrated Tussock to the herbicide flupropanate. This herbicide is of critical importance to the control of these perennial grass weeds.

Approach to Weed Control

The development and implementation of an effective weed control program for perennial grass weeds within native grasslands should adhere to the '3D approach' to weed management: deliberation; diversity; and diligence.

Deliberation: stock-take, set realistic goals and plan strategies

Diversity: persist with monitoring, prevention and management

Diligence: implement a wide range of integrated control methods in a timely manner

This 3D weed management has been developed by Stuart Burge for a number of key weeds including African Lovegrass, Serrated Tussock and Chilean Needlegrass on behalf of AWI and MLA.

One key aspect of deliberation relates to the need to plan a weed control strategy in accordance with the density or level of infestation of the weed. This especially relates to the decision between spot spraying and boom spraying.

In terms of density, the following provides a guide to the different levels of infestation of *African Lovegrass*:

Light: 100 plants/ha (1 per 125 sq m) Groundcover: 0.05%

Medium: 2 000 plants/ha (1 per 5 sq m) Groundcover: 1 %

Dense: 10 000 plants/ha (1 per sq m) Groundcover: > 5 %

For *Serrated Tussock* the categories of infestation are:

Light: 160 plants/ha (1 per 60 sq m) Groundcover: 0.1%

Medium: 160-5000 plants/ha (<1 per 2 sq m) Groundcover: up to 2.5 %

Dense: >5 000 plants/ha (>0.5 per sq m) Groundcover: 2.5 %

As a generalisation, when the weed density or level of infestation is "low" then spot spraying is the recommended option, especially in native grasslands. Once the level of infestation has reached the "dense" or "heavy" level then spot spraying is not realistic or cost-effective and boom spraying is recommended. The control method for the "medium" category of infestation will vary according to the individual landholder's situation as explained below.

Despite these indicative thresholds, there is no set rule or yardstick as to when it is more (cost) effective to move from spot spraying to broad-acre spraying and the legislative approach to weed control needs to acknowledge this fact. This will be influenced by range of different factors and is

premised on the fact that farmers are not all the same. Landowners of private land are extraordinarily heterogeneous in terms of property size, whether they are full-time or part-time, commercial or non-commercial, and whether they reside on their property or live elsewhere (so-called "absentee landowners"). These diverse landowners have widely differing motivations (or lack of motivation) to control weeds and conversely barriers for not controlling them. However, the one thing they have in common is that they have constraints in terms of the time and/or money they can commit to their weed management practices (University of New England 2006). Accordingly all landholders need to prioritise where they allocate their (scarce) resources.

This need is especially of relevance to larger properties where the sheer scale of the land area and weed problem, together with the need to address other key aspects of farm management, means that often it is physically difficult - if not impossible - to adequately control weeds. This is especially the case with spot spraying individual weeds which is very time-consuming and labour intensive.

Prioritising Weed Control in Native Grasslands (Pastures)

The strategic approach to weed control in this program is consistent with "Which Paddock First? Planning Weed Management" (Burge, in draft) which develops the concept of a "SWOT analysis" of paddocks to determine their weed and pasture health status so that they can be prioritised for weed control on the basis of weed "risk" to determine the most effective weed control program.

Within the context of weed control in native grasslands the recommended approach is one which does the least damage to non-target native species - that is, by spot spraying or even hoeing (Commonwealth of Australia 2016). In this situation and that recommended in this Strategy, there will be a need to prioritise spot spraying - and hence labour – to those areas of highest ecological value in order to protect and maintain their conservation status and to "prevent its decline and ensure its long-term survival." (Environment ACT 2005).

However, where the size of the weed problem is large - both at the paddock and farm scale - and where the level of infestation is at a density above that which can be practically and cost effectively spot sprayed (taking into account the threshold levels previously described), then the only realistic agronomic option is either to implement broad-acre weed control programs such as boom spraying or to implement a full pasture renovation program.

In relation to boom spraying, this necessitates the application of the herbicide flupropanate. While regarded as being relatively "selective", it nevertheless causes considerable damage to some key native grasses species including notably Austrostipa and Rytidosperma (syn. Austrodanthonia).

This damage reinforces the emphasis upon spot spraying of weeds in native grasslands of high and medium conservation value.

At the same time it also highlights the role of pasture development as part of an integrated approach to weed control.

As mentioned, where a paddock or site within a paddock has a heavier infestation of serrated tussock or African Lovegrass at a density above that which can be practically and cost effectively spot sprayed, and where boom spraying is deemed inappropriate or there is concern over the damage to non target native species, then the only realistic option is to implement a full pasture

development control program. The justification for such an approach – and one recommended by agronomists – is to free up resources to focus upon paddocks or sites which may have a higher priority for spot spraying either because the weed infestation is lower or the site or paddock has desirable species which need to be protected (Local Land Services South East 2016).

This is undoubtedly the preferred option on non-native or exotic paddocks as well as low conservation grasslands especially those which are the more degraded and substantially modified.

Such an approach is supported by the advice of the Office of the Environment and Heritage who advise that "native grasslands with a history of periodic cropping, pasture improvement, fertiliser application or certain grazing management practices are typically of low conservation value. These grasslands often support only those native species that are able to tolerate disturbances*;* they do not warrant the same level of protection as high-conservation-value grasslands." (OEH 2012).

Summary

- Native grasslands of high and medium conservation value should be prioritised for spot spraying in order to bring about the least damage to non-target native species.
- Where the level of infestation exceeds the threshold levels for spot spraying there is a need to consider either broad-acre spraying or a full pasture development program. Paddocks with exotic pastures or native pastures of low conservation value should be prioritised and earmarked for this full improvement program.
- The justification for such a complete removal or renovation is that it is both cost effective and frees up resources to focus upon the spot spraying of higher conservation grasslands.
- There is no "one size fits all" with regard to weed control. While the control techniques for all weeds are well documented and researched, any effective weed control program or approach should consider the sociology of weed control.

  Legislation and regulatory control should acknowledge this fact.
- It is suggested that current legislation does not allow landholders the opportunity to prioritise weed control programs and scarce resources in accordance with the quality of the grassland and hence its conservation status – that is, it treats all grasslands from one end of the spectrum to the other equally in terms of weed control.
- It is clearly evident that not only is this a barrier to implementing effective weed control but that by adopting such an approach inadequate consideration has been given to the long term consequences of allowing these weeds to continue to proliferate and ultimately therefore threaten the existence the native grasslands.

Engagement with Landholders

Some of the key recommendations of the Ross Report in relation to the Best Practice Conservation of Native Grasslands relate to the fundamental importance of extension as indicated:

- Well-delivered extension programs are fundamental to the success of all elements of grassland conservation.
- Extension programs should aim to generate long-term protection for high priority sites on both public and private land.
- Extension programs should include public land as well as private land and provide incentives to engage in conservation management for both managers of public land and private landholders.
- All extension programs should have access to suitable incentives for maintaining or adopting conservation management.
- Extension is a specialist job requiring an understanding of community dynamics and personality types. (Ross 1999)

In order to ensure its effectiveness and the engagement of landholders which is considered so vital to its success, the Monaro Kangaroo Grass Strategy will undertake a major extension campaign. This will involve the following components:

- It will be coordinated by Stuart Burge who is an advisory / extension officer with a long history of experience working on the Monaro and who has the trust and credibility of landholders.
- It will be a collaborative approach involving range of professional people with different skills and experience including especially representatives of Local Land Service, Sustainable Land Management (such as David Eddy), and Office of the Environment and Heritage.
- The focus will be upon native grasslands but will also be developed using a whole of farm approach. Again such an approach is consistent with the recommendations of the Ross (WWF) Report (1999):

  "For properties that have native grasslands of high conservation significance, a targeted approach that considers the whole-farm situation is desirable."
- Consideration will be given to the development of a formalised training and accreditation process whereby landholders will be required to attend a workshop/field day which provides an overview of the Monaro Kangaroo Grass Strategy with a major focus upon providing skills in paddock assessment and plant identification.

  Upon receiving accreditation, landholders may be exempted from the existing regulatory framework which will nevertheless still exist as a necessary "safety net" (Ross 1999).

The Role of Incentives – The Biodiversity Conservation Trust

It is noteworthy that the primary outcome of this Strategy – that is, to locate those sites of higher conservation status on private land is consistent with the direction of the NSW Government Biodiversity Conservation Trust (BCT) who have earmarked funding to assist with the management of these "best of the best".

As indicated above, one of the “best practice” recommendations in relation to the conservation of native grasslands relates to the fact that:

“All extension programs should have access to incentives for maintaining or adopting conservation management.”

“Extension programs should include public land as well as private land and provide incentives to engage in conservation management for both managers of public land and private landholders.”

It is noteworthy that this recommendation is consistent with one of the issues raised by Bombell and Montoya (2014):

“A major source of frustration among landholders is that the legislation puts the costs associated with retaining native vegetation almost exclusively on landholders. This issue has been a theme common to parliamentary debates on native vegetation clearing controls.

This gives rise to the further question of the extent (if any) to which landholders should be paid (whether through incentives, compensation or otherwise) for providing environmental benefits by retaining and maintaining native vegetation on their properties.”

Given the above thinking, and on the basis of the importance of providing incentives to landholders to protect and manage native grasslands of high regional significance, the Biodiversity Conservation Trust has the potential to play a key role.

While the BCT is focussed upon incentives for owners of private land it is also important to note that one of the recommendations of the Ross Report (1999) also stated, “permanent or long-term protection through reservation or management agreements should be sought for all public land remnants of high conservation significance.” Furthermore, it also advises that “extension programs should include public land as well as private land and provide incentives to engage in conservation management for both managers of public land and private landholders.”

This recommendation is especially relevant because the vast majority of identified high conservation native grasslands on the Monaro are on public land such as TSR’s, cemeteries, churchyards, roadsides, railway easements etc which have had little disturbance history but which are also under threat from the invasive threat of noxious weeds.

Nevertheless, the stated role of the BCT is to support conservation on private land through the provision of a range of initiatives and incentives to landholders who want to manage and improve biodiversity on their properties. Further information of which is provided on their website.

It is extremely noteworthy however that the Monaro native grasslands of high conservation status have been prioritised for funding under the ‘Monaro Grasslands Conservation Tender’ which opens on 20 August 2018.

It is anticipated that the Monaro Kangaroo Grass Strategy will be of considerable assistance in helping landholders to identify those grasslands of special significance which are the target of the BCT and which may therefore be the beneficiary of funding support. It is noteworthy that the

primary outcome of the Monaro Kangaroo Grass Strategy – that is, to locate those sites of higher conservation status on private land - is consistent with the overall direction of the Biodiversity Conservation which has earmarked funding to assist with the management of these “best of the best”.

Source: Snowy Interstate Landcare Committee

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Personal Communications

David Eddy (2018) Senior Land Services Officer. Sustainable Land Management Cooma 2630

Brett Jones (2018) Manager Biosecurity. Snowy Monaro Regional Council Cooma 2630

James Litchfield (2016) “Hazeldean” Cooma 2630

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