

Byron Shire Integrated Pest Management Directions Document A Case for Continuous Improvement



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Cover Page: Byron Shire Council have ceased using all pesticides at all children’s playground by using a combination of steam and hand weeding.

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Project Organisation

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Executive Summary

This Directions Document reports on current success and impediments to implementing Council's 2013 resolution (13-621) (the Resolution) which concerns pesticide use in Byron Shire; while clarifying a secure framework for the development of a Shire-wide Integrated Pest Management Policy and Strategy.

In the nearly five years since the passing of the Resolution, pesticide use by Council staff has ceased in all children's playgrounds, formal bus stops, roadsides, town and village centres and 15 of 23 sports fields. Cessation of pesticide use has been achieved through adoption of Integrated Pest Management principles, which has allowed improvements and innovation in various locations. Approaches to pesticide-free weed control in the Shire now include manual weed removal, timely treatments, steam cleaning (of kerbs), steam weeding, garden bed edging and mowing.

Some pesticide is needed for maintaining the remaining eight sports fields because they have high quality turf areas. However, where pesticides are required, their use is minimised through the adoption of improved horticultural practices. The minimum amount of the least hazardous pesticide to achieve successful weed removal is applied, and when this happens, these areas are closed to public access. Pesticide minimisation protocols are also applied in all bushland reserves and Council facilities outside the town and village centres, albeit within the constraints of maintaining the necessary quality of services and biosecurity obligations.

Council's achievements around reduced pesticide use are to be celebrated. They result from the dedication and effort of Councillors and the staff responsible for implementing the Resolution. However, achieving reduced pesticide use has not come without cost, and whilst in many situations that cost is accepted, in others it is not. For example, cessation or reduced use of pesticides has resulted in some areas having compromised, or potentially compromised public or operator safety, biosecurity management or infrastructure protection; and in some cases there are issues around responsible financial management.

Given this, it is evident that there is a need for change so that the underlying intent of the Resolution is secured for the long-term while not compromising Council's services and other obligations. To achieve this, it is recommended Council develops and adopts an enduring Policy to ensure its goals and aspirations are applied on a 'continuous improvement' basis rather than confining them to any short-term timeframe. Reaffirming of the aspiration to cease pesticide use in (mapped) high use and sensitive areas is recommended, along with introducing an added goal of 'minimisation' of pesticide use in all other areas. Council staff should, however, have an overriding discretionary capacity, guided by strict protocols, to use pesticides in any zone if no alternative exists if there is an overriding need to meet public safety, biosecurity or infrastructure protection obligations within a framework of responsible financial management.

Community engagement and comment is sought on the draft Integrated Pest Management Policy to ensure a robust Integrated Pest Management Strategy can be developed during 2018-2019.

Background

In November, 2013, Council passed Resolution 13-621 to develop a Shire wide integrated pest management policy and strategy, here in referred to as the Policy and IPM Strategy. The full Resolution describing what is to be included in the Policy and IPM Strategy is copied in Appendix 1. For simplification purposes, however, we have interpreted the two main aspirations of the Resolution as:

1. Cessation of the use of all herbicide (and repetitive use of pesticides to control pest animals) in highly frequented public use area within five years; and,
2. Promotion of Integrated Pest Management using methods with the least adverse effect on human health and the environment in all other areas that are not considered as a highly frequented public use area.

In interpreting these two main points we have taken into account that some of the terminology of the Resolutions has proven problematic in application. For example, (a) 'organic' (as used in the Resolution to convey non-hazardous substances) has a specific meaning in chemistry that is almost the opposite of the intent of the Resolution; and, (b) 'pesticide' (which we know was intended to refer to insecticides and rodenticides) technically means a substance used to kill any organism, whether plant or animal. To ensure clear communication that reflects the intent of the Resolution, this Directions Document uses only one term, 'pesticide', to cover any product used in the control of any organism, noting that pesticides, for the purposes of a policy would exclude biological agents and pesticides approved for use in organic farming. (See Box 1 and Appendix 2).

In response to the Resolution, an external consultant was engaged to prepare a preliminary draft *Integrated Pest Management Strategy* (preliminary draft Strategy) (Australian Wetlands Consulting 2016). The preliminary draft Strategy took account of new information about pesticide risk, an audit of pesticide use by Council and a review of alternative methods including their advantages and limitations (see Appendix 4 for further detail on the

Box. 1. DEFINITIONS

Pest - a species, strain or biotype of a plant or animal, or a disease agent, that has the potential to cause, either directly or indirectly, harm to (a) human, animal or plant health or (b) the environment (Biosecurity Act 2015).

Pesticide - a product as defined by the Agricultural and Veterinary Chemicals Code Act 1994. Definition of pesticides covers, bactericides baits, fungicides, herbicides, insecticides, lures, rodenticides and repellents. Pesticides are used in commercial, domestic, urban and rural environments (Pesticides Act 1999).

Herbicides – compounds specifically used to kill unwanted plants and which are the pesticide group given most scrutiny in the pesticides debate.

Poisons - medicines and chemicals (including pesticides), whether naturally occurring or synthetic, that are listed on the Poisons Schedule (Therapeutic Goods Administration 2017) and (Appendix 3). Although this Poison Schedule is not a straightforward gradient of toxicity (as it also considers use categories), pesticides vary in their level of toxicity and risk.

background to the preliminary draft Strategy). An internal Pest Management Working Group (the Working Group) was established within Council to review the preliminary draft Strategy and make progress on the implementation of the Resolution. Staff and a representative of Brunswick Valley Landcare participated in the Working Group, and found the preliminary draft Strategy only partially aligned with the intent of the Resolution (Byron Shire Council 2017).

This revealed a need to more clearly affirm the intent of the Resolution while identifying circumstances in which pesticides, while the least preferred option, might at times be essential to ensure that Council meets its overall obligations. Further evidence was needed about progress made to meet targets and identify impediments and options, particularly with respect to statutory obligations around road safety and pest management as prescribed in legislation (Appendix 5). (The new NSW Biosecurity Act came into effect after the preliminary draft Strategy was completed.) To secure the required evidence, the Working Group undertook a series of case studies, which are included in the Directions Document along with other supporting material about pesticide reduction in other localities.

Purpose of the Directions Document

In order to facilitate the development of the Policy and IPM Strategy, the objectives of the Directions Document are to provide:

- a review of Council's progress over the last 5 years (2013-2017) in implementing the Resolution and evaluation of the successes and impediments encountered;
- analysis of the relative costs and benefits attached to future Policy options; and,
- a discussion of emerging issues to ensure alignment of a future Policy with legislative requirements, customer and community expectations and current levels of service.

Figure 1 shows the steps already taken and planning timeframes for preparing the Policy and IPM Strategy.

The case for minimising pesticide use

Council's aspiration to reduce pesticide use can be seen as one of a suite of initiatives undertaken by Council in recent decades to improve environmental sustainability and conditions for healthy lifestyles. These include innovations in the areas of waste water treatment, biodiversity conservation and bush regeneration; as well as the more recent *Small Steps to Healthy Roadsides* initiative and target to be 100% emission free by 2025.

With regard to pesticide use, Byron's aspirations are in step with initiatives elsewhere in the world to work conscientiously towards a more sustainable use of pesticides and reduce the potential to adversely affect human health and the environment arising from pesticide use. Some extremely poor pesticide practices in the past are well documented as having led to wholesale poisoning of people and their environments, particularly in non-industrialised countries but also in some industrialised countries including Australia. Avoidance of similar situations have been remedied to some degree by tighter pesticide regulation, but there are still

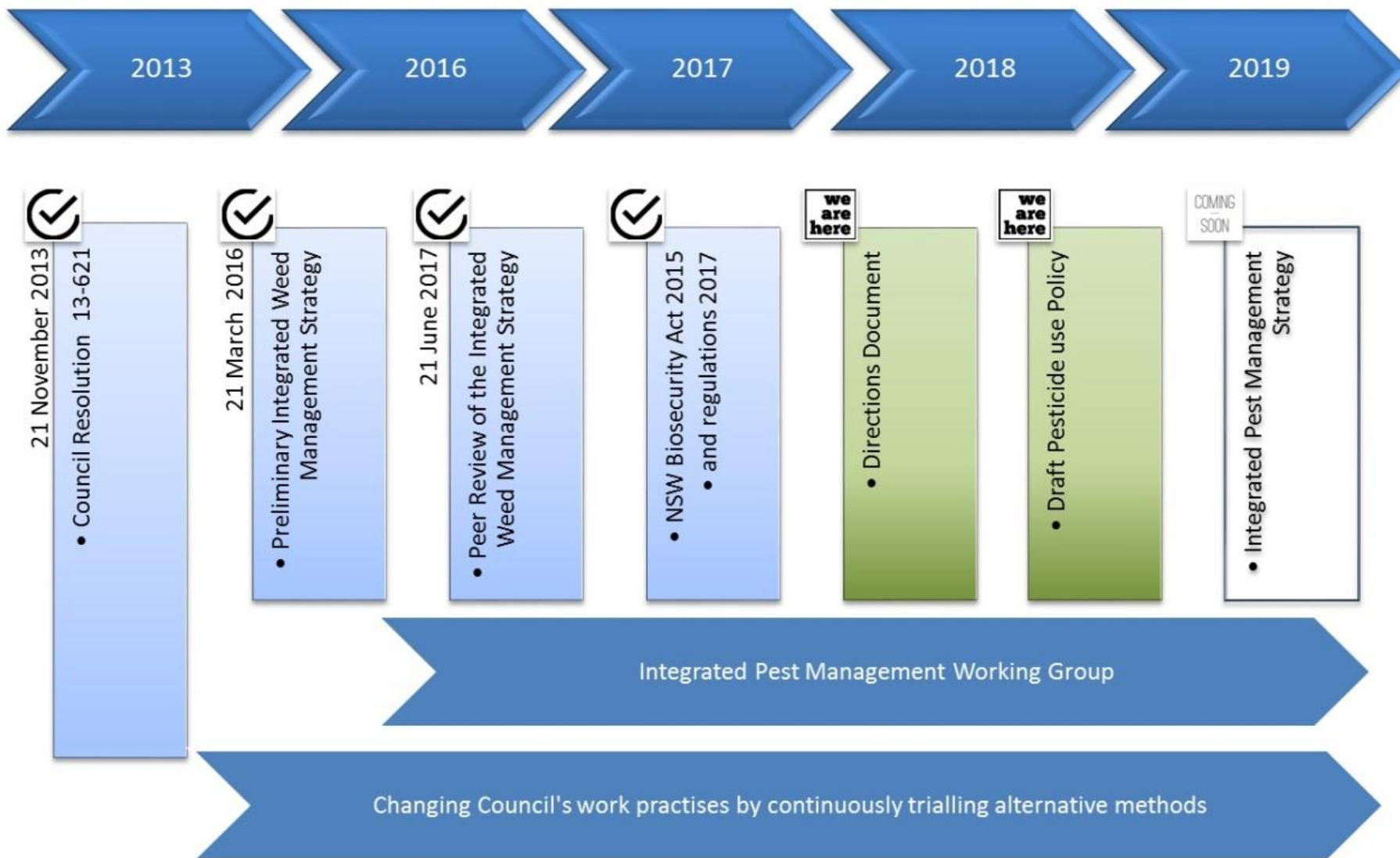


Figure 1. The steps taken and planning timeframes for preparing the Policy and IPM Strategy for Byron Shire.

significant and unresolved pesticide issues in play. They include use of the herbicide glyphosate (Box 2) and other pesticides on a wide range of food crops, which has led to residues in food and increasing weed resistance. Both current and past poor practices have given rise to an understandable legacy of distrust about pesticides; to the point that a social license for pesticide use can no longer be taken for granted.

One basis of distrust is the uncertainty about pesticide impacts on human health and the environment. Another is around an abiding distrust of multinational chemical companies that produce pesticides. While scepticism is an understandable response to potentially risky situations, we can ask whether distrust is warranted in every situation. People do have a level of confidence about the assessment and regulation of pesticides in Australia. The assessment process is delivered through the Australian Pesticides and Veterinary Medicines Authority (APVMA), with pesticide regulation coming under State Government control. Despite current regulation and improved knowledge about pesticide risk and responsible use, a degree of uncertainty will always exist. Uncertainty particularly surrounds possible long term effects of relatively new chemical formulations and existing registered pesticides that are under the spotlight of international and other national jurisdictions. This uncertainty alone provides justification for a policy of risk minimisation and underpins an increasing effort by municipalities throughout the world to reduce or cease pesticide use.

Box 2. Glyphosate use in public areas. One of the most widely used pesticides in the world is the *glyphosate*. In March 2015, the International Agency for Research on Cancer (IARC) re-classified glyphosate as ‘probably carcinogenic to humans’. This has triggered reconsideration by government authorities throughout the world about the use of glyphosate. Although Australia’s Agricultural Pesticides and Veterinary Medicine’s Authority (APVMA) ruled in July 2017 that there was insufficient justification for a change of their advice on the use of glyphosate in Australia (<https://apvma.gov.au/node/13891>), the aspiration to minimise usage and avoid adverse impacts of all pesticides remains a topic of vital interest for all levels of governments throughout Australia.

Council acknowledges that there is considerable concern among communities in Byron Shire about glyphosate, and particularly the promotion by Monsanto of the use of their glyphosate product ‘Roundup’ in global food production. This latter issue, while important, is considered a separate issue to the question of pesticide use on Council-managed land, which is the focus of this Directions Document.

Byron Shire - Success and lessons from the first five years

In Byron Shire, a high degree of success around the implementation of the Resolution has been achieved, although not without cost in services, safety, biosecurity or public amenity. In the five years since the Resolution was adopted, staff have improved their knowledge base to support the aspirations of the Resolution whilst aiming to meet Council's legislative and other obligations and the provision of services to the public.

The following information and case studies (with others provided in Appendix 6) illustrate how Council has addressed the following two main aspirations of the Resolution.

- 1) Cessation of pesticide use in highly frequented public use areas; and,
- 2) Promotion of Integrated Pest Management using methods with least adverse effect on human health and the environment.

Aspiration 1. Cessation of pesticide use

Council staff have sought to cease the use of pesticides in what is understood to be highly frequented public use areas (e.g. the in town and village centres, children's playgrounds etc.). However, uncertainty about the precise meaning of the term 'highly frequented public use area' led to a provisional definition of '*areas of public land established and maintained for which the primary purpose allows or promotes a high level of use by the community* (Australian Wetland Consulting 2016, p 5)'. This included all areas within the boundaries of all town and village centres, children's playgrounds, sports fields (including golf courses), swimming pool areas and parks with facilities and infrastructure. After intense debate within Council in August 2016, all roadsides and formal bus stops within the Shire were deemed to fall within the definition of highly frequented public use areas.

At this time in 2016, the achievements and lessons learned from efforts to cease pesticide use, particularly herbicide use, in 'highly frequented public use areas', fall into the following three categories.

- Category A - where cessation has occurred within a reasonable level of acceptable cost.
- Category B - where cessation has occurred but at a cost that is either unacceptable or likely to be unacceptable.
- Category C - where cessation is yet to be achieved.

Category A. – Areas where cessation has been achieved without unacceptable cost (i.e. maintaining the level of services and meeting statutory obligations):

- ✓ All 34 children's playgrounds;
- ✓ All 41 formal bus shelters;

Council have ceased using all pesticides at all children's playground by using a combination of steam and hand weeding.



- ✓ All 207 public garden beds and kerbs in town and village centres (excluding roundabouts);
- ✓ 70% (or 15 of 23 sports fields that are permanently open to the public);
- ✓ Roadsides where there is no safety or known biosecurity issue; and,
- ✓ Majority of public buildings (with respect to managing rodents).

Processes and lessons learned.

Pest animal control to target rodents and insects is periodically needed in public areas including public buildings, with current rodent control confined to trapping stations and insect control confined to pyrethroids. (Pyrethroid insecticides are a special chemical class of active ingredients found in many of the modern insecticides. Pyrethrins are naturally occurring compounds extracted from chrysanthemum plants and used to make pesticides. Pyrethroids have the same basic chemical make-up as pyrethrins but are not naturally occurring. Pyrethroids are a man-made product). Other pest animal control methods are confined to trapping e.g. wild dogs, European Red Fox and feral cat.

Weed control is required to reduce trip hazards, control pest plants and to maintain road safety and specific long-term infrastructure. Weed control is carried out without pesticide use in playgrounds, sports fields, bus stops and pedestrian areas in town centres using a range of methods. These include manual weed removal, weed-contaminated soil removal, steam cleaning of soil from cracks in pavements, steam weeding (Box 3), brushcutting and mowing. Prevention of reinfestation by weed is enhanced by the use of improved paving materials and garden bed edging, in combination with improved horticultural practices such as aeration of turf to improve its health and resistance to weed. While coming at a higher (but accepted) financial cost, the quality of the service in some cases represents an improvement through innovation and attention to the timing of pesticide applications (see Case Study 1). In other cases, higher standards will be achieved over time through the gradual rolling out of resources.

Box. 3. Steam Weeding

Steam weeding – is hydro-thermal weeding using water temperatures greater than 98-103°C (205-218°) that are rapidly transferred into the plant cells, and assisting in the control of weeds. 98-103°C, 205-218°F. The boiling water does not penetrate more than about a ¼" (5mm), into the soil. This has an effect on the crowns of weed species but little effect and no lasting impact on either the roots of weeds, perennial crops, trees, vines etc. or important soil organisms.

The stage in the weed growth cycle depth of rhizomes, bulbs or corms and timing of works will influence the effectiveness of a steam weeder to manage weeds.

Although it appears that success is well on the way in these areas, situations may arise where Council staff or the public identify a potential unacceptable cost (i.e. disbenefit). For example, risks around the highly prickly Bindii weed a hornet's nest or Fire Ants that might emerge in children's playgrounds and be beyond the capacity of staff or volunteers to treat with

alternative methods. Fire Ants, for example, have been found in the City of Logan, only 150km north of Byron Shire, where new infestations were treated as recently as August 2017 (Kerr 2017).

In such situations, it would be desirable for Council staff to be able to use discretion and professional judgement to select the least hazardous substance, and use it in a manner that minimises the possibility of spray drift, impacts upon people, and contamination of the environment or non-target species or objects. In the case of children's playgrounds or other sensitive areas, this discretionary capacity should involve forward planning and appropriate engagement with stakeholders, particularly those who use the area. If action is required prior to consultation, temporary closure of that areas may be necessary.



Case Study 1. Playsafe Kids outlines the needs, current situation and benefits to cessation of pesticides at children’s playgrounds.

Playsafe kids

Overview

The need

Every parent hopes that children’s playgrounds are safe places, where children can flourish and grow. Avoiding exposure to pesticides (treating pest plants and animals) is desirable as it removes exposure of children to possible unknown effects on children’s development.

Current situation

The use of pesticides has ceased and has been replaced by the use of a steam weeder and cleaner as well as physical control of pests.

Current benefit

Risk of pesticide exposure removed for children while retaining a safe and enjoyable place to play.

“All of Council’s 34 children’s playgrounds are classified as pesticide-free.”

— Andy Erskine, Open Space Technical Officer

Weed and the general growth of vegetation on children’s playgrounds can pose a risk to their safety. The unchecked growth of some vegetation can also pose a threat to the integrity and lifespan of the infrastructure. For both reasons weed and vegetation growth in these areas need to be managed in a suitable and sustainable manner.

However, there are concerns about the use of pesticides in areas such as playgrounds due to possible exposure of playground users, particularly children, to potentially harmful chemicals.

Implementing improvement

In 2014, Council acknowledged community concerns in regards to pesticide use in children’s playgrounds and adopted a pesticide-free approach to manage weed and vegetation grow in all of Council’s 34 children’s playgrounds.

Council staff have achieved this outcome by replacing the use of herbicides with hand weeding and steam weeding, followed by suppression of weed growth through mulching where appropriate.

Hand weeding includes pulling of annuals and tap-rooted vegetation as well as digging out perennial weeds that re-sprout from underground root segments. The effectiveness of this method is dependent on the removal of as much of the root system as possible. Steam weeding (refer below) has temperatures >98° Celsius (205°F) and can rapidly transfer that heat into the plant cells, assisting in the control of weeds. While steam is not usually effective in killing underground parts of perennials, once a regular program is implemented it can provide control of weed in playgrounds for around 6 weeks prior to retreatment being necessary.

While hand and steam weeding are more labour-intensive and time consuming, this is considered acceptable in the case of the small infestations as often found in children’s playgrounds. These methods reduce public concerns of potential exposure of children to herbicides.

Category B – Areas where cessation has been achieved but with unacceptable cost (i.e. reduction in amenity, services and the risk of failure to meet statutory obligations around operator and public safety):

- Roadsides where safety may have been compromised or operators may have been placed at higher risk of accidents;
- Drains at high risk of failure due to build-up of vegetation;
- Road resurfacing where the infrastructure is compromised by laying the surface over live weeds; and,
- village centre roundabouts where high quality trees cannot be excavated as a way to remove nutgrass.

Processes and lessons learned. Pesticide cessation on roadsides has been achieved by mowing, brush-cutting and, in the case of drains, by shoulder grading. Improved weed containment protocols (including vehicle hygiene) offer potential to prevent the spread of weed. However, there have been situations where alternative weed management options are inadequate, do not exist, or are too costly or unsafe for operators. This has resulted in neglect of the asset which has led to drainage impairment, compromised sight lines and reduction of the visibility of road safety markers, barriers and signage (see Case Study 2). Cessation of the practice of applying pesticides prior to the resurfacing of roads has also compromised the integrity of the new road's surface, and cessation at roundabouts that harbour weeds that are impractical to treat manually has compromised their high ornamental value. In these situations, a common-sense case exists for Council to allow staff a discretionary capacity within a framework of professional judgement around the judicious use of a pesticide. Judgement would be applied within the constraints of a prescribed protocol, developed in consultation with stakeholders and built into the Strategy that removes public exposure to the pesticide.

Roadsides where cessation of pesticides has been achieved has compromised sight lines and reduction of the visibility of road safety markers, barriers and signage e.g. Possum Shoot Road.





Case Study 2. ‘Long Road aHead’ outlines the needs, current situation and benefits to cessation of pesticides on our Regional and Local roads

Long road ahead

Overview

The need

Managing roadside areas is complex due to a number of competing values and issues. Conservation needs must be balanced with road safety, soil stability, water runoff, legal requirements, bushfire risk, infrastructure corridors (water, power, telecommunications), cultural values, firewood collection, grazing, recreational values (horse riding, hiking, bike riding), educational values and development needs.

Current situation

Cessation of pesticides has been achieved on Regional and Local roads by undertaking management of vegetation using mechanical means.

Current benefit

Risk of pesticide exposure removed for our residents and visitors

“Managing all vegetation on roadsides is complex. Cessation of pesticides has resulted in undesirable and unacceptable roadside conditions, which needs to be addressed with short and long term actions while also meeting our statutory obligations.”

— Tony Nash, Works Manager

Road management between NSW Roads and Maritime Services (NSW RMS) and Councils in NSW provides for three categories of road: State, Regional and Local. State roads (e.g. major arterial links throughout the state and within major urban areas) are managed by the NSW RMS. Regional and Local roads and their respective road reserves are the responsibility of Councils to fund, determine priorities and carry out works. The roads are a council asset.

Byron Shire Council has 2,434 ha of road reserve or 606 km of Regional and Local road (approximately 3.3% of public roads in NSW) including 506 km sealed & 100 km unsealed, plus the associated 107 km of urban stormwater pipes, 4,106 urban pits, 1,300 single rural pipes, 86 rural causeways and 79 major rural culverts.

Implementing improvement

Managing all vegetation on roadsides is highly complex, but in line with the aspiration, Council staff ceased the use of pesticides on Regional and Local roads. Management of vegetation is undertaken by mechanical means using driven plant (e.g. tractor slashers, boom mowers) or hand power tools (e.g. brush cutters). These alternative methods however have proven ineffective in managing vegetation associated with roadside assets e.g. guard rails, pedestrian fencing, slopes/retaining walls and drains where the use of a slasher and/or hand weeding can be incompatible and/or have unacceptable risk to public and operators safety. The reduction of vegetation from guardrails, however, is important because guardrails often hide a steep drop-off and the reflective markers that delineate the road.

Despite effort, cessation of pesticides has resulted in undesirable and unacceptable conditions on roadsides where vegetation growth blocks lines of sight, safety barriers and signage, even forcing pedestrians onto the road. Balancing the spirit of the aspiration with statutory obligations requires major review including human and financial resources consideration.

Category C – Areas where cessation is yet to be achieved (i.e. where effective or affordable alternatives are not yet available to maintain services and meet statutory obligations):

- High quality and premier sports fields where public access is controlled.
- Public buildings on a lease where the management of pest animals such as insects and rodents is at the discretion of the leaseholder.
- Public buildings under the management of Council staff where the management of insects such as cockroaches, spiders (household & webbing spiders) and silverfish and is undertaken using pyrethroids based products outside core business hours.

Processes and lessons learned. Herbicide use for the maintenance of premier sports fields (including Cavanbah in Byron Bay) has been highly reduced. Weed management is now achieved by horticultural practices including soil aeration and improving fertility, as well as the selection of pesticides with the lowest poison-rating (see glossary and Appendix 3) of those able to achieve the desired outcome. On areas where pesticides are used, warning signage and barriers to prevent access by players or the public are put in place for the appropriate periods of time. Staff continue to seek to identify new lower-risk pesticides, including pre-emergent pesticides that can prevent problematic weed reinfestation's. On the basis that premier sports fields can be closed to the public as needed, a common-sense case can be made that would allow Council staff a discretionary capacity to deploy a pesticide within a framework of professional judgement and using a prescribed protocol. This would nonetheless aim for minimisation of pesticide use on a continuous improvement basis (see Case Study 3



Case Study 3. ‘Having a ball’ outlines the needs, current situation and benefits to cessation of pesticides at 15 of 23 sportgrounds.

Having a ball

Overview

The need

Council is responsible for all active community owned assets and this includes 22 sports grounds of which 6 are classified as Grade A.

Current situation

Pesticide use has ceased at 16 Grade B sports grounds and has been replaced by the physical control and/or the acceptance of pests. The use of pesticides has been highly minimised at 6 Grade A sports grounds by horticultural practices including soil aeration and improving fertility.

Current benefit

Risk of pesticide exposure removed from Grade B sports grounds while retaining a safe and enjoyable place for amateur play. Exposure to pesticides minimised from Grade A sports grounds but standards maintained to attract high profile sporting events and programs e.g. Liverpool FC International Academy without playing quality being compromised.

“73% of Council’s 22 sports grounds are classified as pesticide-free.”

— Andy Erskine, Open Space Technical Officer

Standards for sports grounds are provided by Parks and Leisure Australia, the peak industry association for professionals working in the Parks and Leisure sector. Standards for sports grounds are measurable and have defined limits of performance. Standards for the turf surfaces can be used to describe for example:

- How the player’s body responds to the surface (e.g. traction, hardness).
- How the ball (if used) interacts with the surface (e.g. rebound height, smoothness and speed of roll)

Implementing improvement

Grade B sports grounds compose of opportunistic grasses that when mowed short provide an open space for sports, but are wear-prone for interclub and/or professional play. In 2014, Council staff acknowledged community concerns in regards to pesticide use on sports grounds and have adopted a pesticide-free approach in managing pests on all Grade B sports grounds. Council staff achieved this by replacing the use of pesticides with regular mowing, hand weeding and/or the acceptance of some pests.

Pesticide uses for the maintenance of Grade A sports grounds has been reduced by improved cultural practices including soil aeration, fertilization and irrigation. The minimal use of pesticides with the lowest poison-rating combined with capacity to manage sports ground use is carefully considered. When pesticides are applied they are done so through specialised equipment that eliminates wind-drift. In this manner, council staff are able to achieved the desired Grade A outcome. On areas where pesticides are used, the timing of application, the use of warning signage and barriers is used. Staff continue to identify pesticides with the lowest poison-rating including pre-emergent pesticides that can prevent problematic weed reinfestations.

Aspiration 2. 'Minimal risk' use of pesticides

The Resolution called for an aspiration to cease pesticide use only in highly frequented public use areas rather than throughout Byron Shire. However it advocated avoiding adverse impacts wherever possible. As a result, efforts have been made to minimise pesticide use in all other areas over the last five years. This has proved feasible in some areas but has revealed problems in other areas.

Category A – Areas where pesticides are being minimised, with no or low unacceptable cost:

- Garden beds outside town and village centres.
- Bush regeneration sites
- Community volunteer sites on Council-managed land

Processes and lessons learned. In garden beds, high quality landscape amenity outcomes have been achieved by manual methods for 90% of the weeds. Minimal pesticide spray for the remaining 10% is necessary to avoid repeated or higher pesticide use at a later date. Heavy mulch is applied after spraying to remove risk of public exposure to treated sites. This mulch and dense planting is used to suppress weed growth and reduced the number of times per year a site requires retreatment.

Approximately 80% of the volunteer bush regeneration groups working on Council-managed land in the Shire use a variety of weed control approaches but tend to apply pesticides (i.e. herbicides) directly to a cut stump. Generally, these groups leave spray methods to be applied by the Council Bush Regeneration Team as needed; although two volunteer groups work entirely without pesticide use.

Council's Bush Regeneration Team also uses manual techniques as appropriate but largely relies on the use of pesticide as a labour-saving and therefore a cost effective device. It needs to be noted, however, that the standard practice of bush regenerators, whether or not pesticides are used, is to remove weeds in a manner that allows native plants to regenerate and outcompete weeds. This approach avoids the need for repeated pesticide application in any one location over the long term. This means that, even where pesticides are used in bush regeneration, they are not used in the same place over the long term. It is also standard practice to use pesticides with the lowest poison-rating (where they can achieve the desired results) and to undertake the timely treatment of weeds to avoid them reseeding and thus reinfesting an area. **With between 80-90 sites already under treatment or maintenance by Council's Bush Regeneration Team, there is no current capacity for the team to take on more labour intensive manual work, nor is further reduction of the area of their work desirable considering the net environmental and public benefits being gained from the work.**

Category B – Areas where pesticides are being minimised with unacceptable cost:

- Some bush regeneration sites
- South Byron STP

Processes and lessons learned. While many bush regeneration sites are maintained at an acceptable level, ensuring natives develop to outcompete weeds, others have not been maintained prior to weeds reseeding. This is partly because of real or perceived pressure to reduce pesticide use beyond levels that are practicable. This is a matter of considerable concern because bush regeneration is a long term investment and reduction in quality of results or abandonment of work on a site during the recovery phase represents a waste of resources invested to date. (See the section below ‘Emerging Issues and Solutions’.)

This situation has occurred at the Byron Bay Sewage Treatment Plant’s (STP) constructed wetlands which have high value for wetland birds. Parrots Feather (*Myriophyllum aquaticum*), a weed listed under the NSW Biosecurity Act, emerged in at least one of the wetland cells at the STP. As more recent formulations of glyphosate that are registered for use over water are ineffective on this weed, substantial efforts were made to treat it when the population was small using three different methods: manual removal; flooding; and, draining combined with the use of Roundup® herbicide, the original formulation of the herbicide glyphosate (which is effective against Parrots Feather but not registered for use over water). As rapid and complete drainage is not possible in the high rainfall climate of Byron Shire, the infestation is now at the point where it poses a significant threat to vital breeding and feeding habitats for the culturally significant Black Swan (*Cygnus atratus*), the Comb-crested Jacana (*Irediparra gallinacea*) (listed as Vulnerable) and the Black-necked Stork (*Ephippiorhynchus asiaticus*) (listed as Endangered). This appears to be a situation in which, rather than taking a pesticide minimisation approach, it may have been more effective to use a higher risk herbicide - or Roundup® under an ‘off-label’ permit. (The AVPMA has a Permits Scheme in place that allows for the legal use of chemicals in ways different to the uses set out on the product label. These are often called ‘off-label’ permits). The result is that the weed has expanded to the point where it is now a far higher environmental threat than previously and the site now requires a much larger volume of a higher risk pesticide than would have been the case had this action been taken when the volume of the weed was small.

This situation - and those around emerging biosecurity threats such as Fire Ants - provides us with a valuable lesson: **when biosecurity threats emerge, a rapid response is required even if that involves the use of a pesticide.** This illustrates the wisdom of taking a relatively smaller risk to avoid a larger risk at a later date. (See Case Study 4.)



Case Study 4. ‘Action Required’ outlines the, current situation and constraints to cessation of pesticides at the Byron STP

Action required

Overview

The need

Parrot's feather is a semi-submerged aquatic weed that grows in coastal waterways of eastern Australia. It is native to South America and widespread around the world. It can form dense stands within a waterbody, impeding water flow prevent light penetration and altering natural habitats. Offsite dispersal is a major threat.

Current situation

Drainage of constructed wetland cell, applying approved pesticide to Parrots Feather has been most effective. Removing dense dried mats of Parrots Feather by mechanical means is proving difficult..

Current benefit

Minimal.

“In the context of managing weeds within constructed wetlands, Parrots Feather is hugely complex and challenging without the use of pesticides.”

— Bryan Green, Water Sewer Systems Environment Officer

Parrots Feather (*Myriophyllum aquaticum*) is a weed listed under the NSW Biosecurity Act 2015, and has emerged at the Byron Bay Sewage Treatment Plant’s constructed wetlands. The infestation poses a significant threat to vital breeding and feeding habitats for the culturally significant Black Swan (*Cygnus atratus*) and vulnerably listed Comb-crested Jacana (*Irediparra gallinacean*) and endangered Black-necked Stork (*Ephippiorhynchus asiaticus*).

Implementing improvement

Parrots Feather is capable of rapid proliferation. All nodes can take root and forms mats in still or slow moving water. It prefers water with high nutrient and sediment levels and tolerates damage, grazing, hot and cold temperatures and salt water at low levels. These features make it very highly difficult to control.

Parrots Feather has been observed by Council staff since the 1990’s. Initially, there were difficulties identifying a pesticide that is registered for use in waterways and effective against Parrots Feather. An approved pesticide was used (under permit) to some effect, however, in line with the aspiration to minimise pesticide use, Council staff attempted control by physical removal and increasing water level to a depth of 2m (to shade out light). Both management options failed to control Parrots Feather. An effective management technique to date has been to drain an affected waterbody for a period of 2-3 weeks thereby allowing the Parrots Feather to dry out, followed by an herbicide application that allows for optimal performance for the wetland cell in final stages of water treatment.

Today, Parrots Feather has completely colonized and carpets at least one cell, impeding water flow, light penetration, reducing dissolved oxygen and limiting valuable waterbird habitat. Concern is that it may outcompete and replace native species, value to fish and wildlife. Currently, the infestation is largely contained by cell levees but there is a chance of all wetland cells becoming infested as all cells are inter-connected. High quality treated water also flows into the Belongil Drainage Union, leading to Belongil Creek. This demonstrates a rapid response need when a biodiversity threat is in small proportion, even if it involved the use of a pesticide.

Pesticide Reduction in Other Jurisdictions

We can learn a lot from what is being done by other governments around the world to minimise and or prohibit the use of pesticides. An examination of overseas and Australian cases (Appendix 7) showed that a number of European countries, states and regions are implementing pesticide minimisation or prohibition policies and similar processes are being enacted in Edmonton, Canada, Auckland, New Zealand and several Australian municipalities.

Our findings can be summarized as follows.

- All cases with a policy of prohibition or minimisation have all resulted in substantial reduction in use of the target pesticide/s.
- In all cases a transition period has occurred or remains in operation.
- In all but one case (as it remains in transition) the policy includes exemptions for essential services and/or a permitting system.
- In many cases the emphasis is on glyphosate-based herbicides as a result of recent concerns it may have carcinogenic properties (see Box 2 and Appendix 7).
- Not all cases that considered herbicide prohibition have adopted prohibition policies, and some have limited policies to specific areas
- The Australian cases represent a range of aspirations, levels of success and rate bases with which to manage the areas of land for which they are responsible (Table 1).

Table 1. Provide an overview of the characteristics of local governments in Australia that have aspired to reducing pesticide use. Note that Byron Shire, with higher aspirations than many other Councils, has a relatively high area of land to manage with a relatively low rate base.

	Byron Shire Council (NSW)	Willoughby City Council (NSW)	Inner West Council (NSW)³	City of Fremantle (WA)	Shire of Augusta Margaret River (WA)
Total LGA area (ha)	56,600	2,200	351,900	1,900	287,900
Estimated Population in 2017¹	31,556	76,000	192,030	32,482	14,258
Rate Base (incl. residential, business, mining and farmland)	15,328	31,761	-	-	9,613
Residential zoning (ha)	271	890	-	-	4,566
Bushland (ha) under council management (vegetated land)	406	330	-	-	112,889
Rural land use (ha)	37,382	Not applicable	Not applicable	Not applicable	78,401.6
Business zone (ha)	162	130	-	-	3,232.8
Road reserve (ha)	2,434	440	-	-	3,652.6
Open Space & Reserves (ha)	61	30	-	-	2,935
Recreation (ha)	45	130	-	-	55.4
Playgrounds (#)	34	50	-	-	29
Climate	Humid subtropical, with mild winters and warm to hot summers	Temperate, with mild and cool in winter to warm and hot summer	Temperate, with mild and cool in winter to warm and hot summer	Mediterranean, with warm to hot dry summers and mild, wet winters	Mediterranean, with warm to hot dry summers and mild, wet winters
Biodiversity Hotspot Status²	Global and Australian	nil	nil	Global and Australian	Global and Australian

Available at <http://forecast.id.com.au>

¹ Figures sourced from .id that delivers population forecasts to councils across Australia and recently in New Zealand.

² Biodiversity hotspots are defined as regions where exceptional concentrations of endemic species are undergoing exceptional loss of habitat.

³ Due to the continuing merge of three local government areas, key information on the councils collective area of management is currently unavailable.

⁴ Data unable to be attained

Emerging issues and potential solutions in Byron Shire

1. Need for improved communication about the direction of the policy.

Between council and community

Since the adoption of the Resolution there has been some confusion and inaccurate expectations among some sectors of the community. Some members of the public believe that pesticide use is banned in all areas of the Shire. As a result, Council staff have been periodically accosted or unduly criticised while going about their work. At times staff defuse criticism by providing correct information about the Council's commitment; but at other times there is a sense that current services and the management of bushland 'should' be able to be achieved without pesticide. This belief is based on the well-intentioned but not always accurate assumption that pesticide-free approaches are necessarily available or more beneficial in all situations. Such misunderstandings between the community and council can erode trust and considerably lower the morale of Council staff who work hard to deliver the agreed goals.

Given this, it is important that Council develops a pesticide policy that clearly reflects the different targets of the Resolution and makes the content of the policy clear to the public. This would help people appreciate that Council's staff are committed to continuous improvement by minimising herbicide use and mitigating any impacts that could adversely affect the health of people and the environment. This will hopefully lead to an atmosphere of improved trust within the community with regards to Council's operations, and a greater degree of alignment between community expectations and the task of turning aspirations into reality. However, clarification and communication cannot alone improve council/community relationships around pesticide use. There is a need to better understand the dynamics of the pesticide debate within the community and allow this understanding to enhance Policy and Strategy development.

Within the community

A very high proportion of the residents and visitors to the Far North Coast region of NSW, including Byron Shire, are highly sensitised to the need for improved environmental practices, but there is no mutual agreement as to what this entails around pesticide use. It is evident from talking with members of the community that substantial disagreements and polarisation occur within the community about pesticide use, including on private land. Some people are strongly opposed to herbicide use on the grounds that any herbicide use results in an unacceptable level of human and environmental contamination; while others are strongly in support of responsible herbicide use because of existing and imminent weed threats to the region's biodiversity – and it is likely that there are many who have either not yet formed a firm opinion or who are disinclined to take sides.

To date, Council has yet to ask the community about their preferences for future pesticide policy, including community views of pesticide use on public land. For this reason this Directions Document recommends a well-designed social engagement framework that carefully considers a suite of policy options around integrated, long-term pest management. The first stage of this engagement is public exhibition of this Directions Document and draft Policy, which will take the

form of facilitated information-sharing sessions with stakeholder groups, and direct communication to the community through local press and social media. This engagement process, of genuinely listening to community input and carefully explaining the benefits and disbenefits of policy options (Table 2), should optimise potential for the Council and community to work together to build an enduring basis for pesticide policy reform.

One key issue to be canvassed during social engagement may be Council's proposed criteria for decision-making around pesticide use (Box 5 on page 30 provide examples of possible criteria useful for a decision-making tree). These criteria currently reflect a process of careful consideration of complex scenarios, where there is not always a simple answer. The goal is to attain a benefit while avoiding adverse impacts upon human health and the health of air, soil, water and biodiversity.

Within Council

In some cases, the sudden cessation of the use of pesticides has stimulated innovation among front-line staff, which has increased job satisfaction and morale. In other cases, morale has been lowered when there is staff or public confusion over pesticide exclusion areas; cessation has been imposed without adequate lead times; or, where inappropriate cessation has occurred.(e.g. when road safety is affected). Staff are at the coal face of ensuring optimal implementation and to identify the best solutions to balance the aspirations of the Resolution with the need to attain practical outcomes.

A consistent and clear evidence-based policy can help address confusion regarding pesticide exclusion areas and encourage further innovation in practical outcomes. Issues of pesticide use where it is still considered necessary can be alleviated by applying a 'continuous improvement' approach in which staff seek new ways to minimise pesticide use over time. A culture of valuing problem-solving among staff members can lead more securely towards holistic sustainability goals, while maintaining morale and productivity. A more gradual plan – if communicated well to the public - may then attract a higher level of confidence among the community in the capacity of Council staff to deliver services while also avoiding adverse impacts from any pesticide use.

2.Risk of under-appreciation of the importance of pesticide use to bush regeneration in the Shire

Ecological restoration, including bush regeneration, is a key to the sustainable future of Byron Shire's natural environment. Although manual methods can be effective and efficient in some areas where guided by skilled personnel, the wholesale replacement of pesticide use with manual methods would result in a reduction (by large orders of magnitude) in the amount of area that can be manually treated in any one year. We need to ask therefore, which would pose the greater risk to the environment; the use of pesticide or the reduction in area treated? When these two factors are carefully considered, it can be shown that current pesticide use presents a relatively low overall risk compared with the risk of substantially compromised biodiversity conservation.

The importance of ecological restoration programs within the Shire cannot be overstated – and these must be time-efficient and effective. Byron Shire supports amongst the highest number of threatened species of any Shire in NSW (Byron Shire Council 2004) and is home to 145 threatened species of flora, 183 threatened species of fauna (including insects) and 11 Threatened Ecological Communities (A. Ratcliffe, Brunswick Valley Landcare, pers. comm. 18th January 2018). Importantly, the Shire is part of only 15 ‘Biodiversity Hotspots’ in Australia and only one of 36 Biodiversity Hotspots recognised internationally (Williams et al. 2011). (A ‘biodiversity hotspot’ is an area in which extremely high levels of unique biodiversity are combined with very high levels of threats to that biodiversity.) (See <http://www.environment.gov.au/biodiversity/conservation/hotspots>.)

Volunteer (largely Landcare) programs on private and public land have attracted huge support throughout the region. This has been supplemented by millions of dollars of NSW and Australian government investment in the employment of bush regenerators using pesticides (T. Parkes, Big Scrub Landcare, pers. comm., November 2017, Parkes et al. 2012). The availability of this funding is based on strong aspirations among the public to make substantial gains in reversing on-going biodiversity decline. Council has also benefited from government funding to support major bush regeneration projects on Council-managed land. The major State government funding body to Byron Shire Council, the NSW Environmental Trust, state in their guidelines to applicants that: *“paid bush regeneration and revegetation contractors are expected to use industry recognised best practice. While it is an applicant’s choice to use other methods, such as herbicide free techniques, it is likely that these alternative methods will not be demonstrable as being as effective or efficient, or cost effective as best practice techniques and are less likely to receive funding”* (NSW Environmental Trust 2018, p 26).

As mentioned in the previous section, some members of the public have conveyed to Council’s Bush Regeneration Team an expectation that weed management in bushland, including areas not frequently accessed by the public, should be managed without pesticide. The benefit of non-pesticide approaches has certainly been demonstrated at a small number of sites by skilled and motivated volunteers and much can be learned from these successes in terms of labour-saving strategies and tactics. However, there are limits to the applicability of these methods depending on a site’s nutrient status, level of disturbance, weed species and whether desirable vegetation is of the type that can shade out weeds or the type that suffers from their competition. Limits are also presented in terms of the labour force available to achieve success at a landscape scale, given the magnitude of the weed problem of weed in the Shire’s remnant and regrowth areas and the need for control of weed in corridor plantings.

Although there is no current push to exclude pesticide use from bush regeneration in the Shire it is important for the community to understand why it is necessary for Council staff to retain a capacity for the judicious use of pesticides in bushland areas not highly frequented by the public. As explained above, this will provide measurable benefit and avoid time consuming and environmentally problematic outcomes. In contrast, abandoning or substantially reducing pesticide use in these areas can result in adverse impacts to people and the environment through:

- Neglect of weeds that are too difficult or too costly to manage without pesticides particularly at a landscape scale;
- Reversal of progress at some sites due to reduced efficiencies;
- Increase in work load beyond current capacity;
- Head, back and shoulder injury to workers undertaking hand pulling or ongoing pruning or cutting of trees that re-sprout where non-herbicides methods are not effective ;
- Loss of habitat where lopped or cut plant material is removed manually;
- Reduction in participation by volunteers: e.g. Landcarers and Dunecarers unwilling or unable to adopt alternative methods that are more labour intensive;
- Potential damage to non-target plant and animal species - and spread of some weed species -by use of machinery;
- Potential erosion and siltation if inappropriate disturbance is applied through manual or mechanical weed removal, leading to increased turbidity in streams if applied near waterways

Long term record-keeping in the Shire and other areas shows that the judicious use of a low risk pesticide in a bush regeneration context, applied strategically over time, can facilitate the replacement of weeds by natives. This reduces or eliminates the need for repetitive use of herbicide in that area. This complies with the precautionary principle which encourages people to take a well-timed strategic risk to avert the need to take a larger risk later.

3.Risk of decline of landscape amenity and biosecurity standards

Pest species can give rise to significant health, amenity, aesthetic and environmental impacts that can gradually erode environmental integrity, quality of life, psychological wellbeing and community pride. Yet at times, routine pest management may not be warranted and there can be cases where some conventional techniques (e.g. treating weeds or pest predators for the sake of it) can cause them to be replaced by more destructive pest species. The aspiration to cease and minimise pesticides is therefore not only a procedural change; it also involves social cultural change that requires time and reflection.

For instance, there can be no doubt of the need to maintain a satisfactory level of control of rodents and some insect or disease pests considering the need to protect public health; and it is clear that some weeds have a negative effect, depending on the circumstance. Other weed species, however, may not present problems or may even be beneficial in some situations (e.g. as habitat or to outcompete more problematic weed). It is nonetheless important to take care not to replace a past culture of routine pest control with a culture of neglect. This neglect can be avoided by:

- Recognising that past use of pesticide, whether excessive or appropriate, has created a legacy of lower levels of pests and that the impact of lowering standards may take decades rather than years to become evident. For example, at Council's McLeods Shoot bush regeneration site the use of glyphosate between 2006 and 2016 has reduced by 81.7% but the site continues to use approx. 1,200 milliliters per annum to suppress and maintain low levels of pests; and,

- Ensuring support for Council staff to continue to manage pest species where it is clear, that where pests are required by law to be treated or where they are identified by Council staff as impinging upon Council’s obligation to provide services and maintain valued assets in the Shire.

Benefits and Risks of pesticide cessation and minimisation.

Managing risk is a major driver in Council policy and operations. However, an equally important major driver is that of delivering benefits.

For example, ceasing pesticide use is more likely to be applicable in some situations rather than in all situations, at least in foreseeable time frames, due to the presence of risks identified during Council’s first five years of implementing the Resolution. A focus on ceasing pesticide use in public areas that people use very frequently is therefore an important first step towards optimising the intent of the Resolution. Continuous efforts to *minimise* pesticide use in other areas will require careful consideration of risks and benefits.

If risks are assessed to be acceptable and then managed responsibly, they can be framed around ‘taking a risk to get a benefit’. Conversely, if the risks are assessed to be unacceptable and unable to be managed responsibly, they must be framed around the need to avoid unacceptable risk.

Benefits

The benefits of ceasing pesticide use in high use public areas are manyfold. They include:

- Protection of the public and operators from exposure to chemicals that might have known or unknown current and/or future health effects;
- Protection of the environment from off-target damage from pesticides;
- Protection of soils and waterways from potential contamination;
- Increasing comfort levels among the public with respect to perceptions of hazard;
- Increased innovation with respect to improving prevention and efficiency strategies;
- Avoidance of wasteful and unnecessary treatments.

Risks

Risks are also likely, however, if inappropriate reduction of pesticide use could result in reduction of Council’s :

- legal obligations to public safety under the Roads Act 1993 and to worker health and safety;

- legal obligations to environmental management under the Local Government Act 1993, Protection of the Environment Operations Act 1997, Pesticides Act 1999, Local Land Services Act 2013, and the NSW Biosecurity Act 2015;
- maintenance of valuable and expensive infrastructure (including buildings, roads, and amenity landscape);
- excessive expenditure on pest management at the expense of other Council services.

While cessation has proven to be feasible in limited zones, many of the benefits of pesticide cessation can also be met by careful pesticide use and the selection of lower risk pesticides in areas where cessation is not feasible. This shows that a combination of cessation in some areas - combined with minimisation (on a continuous improvement basis) with a discretionary capacity of Council managers to approve the use of pesticides where required in the public interest - offers a more reliable mechanism for balancing risk and benefit.

Recommendations

1. Undertake public communication

Public exhibition of the Directions Document and draft Policy is vital to provide appropriate opportunities for feedback from a wider range of stakeholders.

Facilitated consultation is recommended that can ensure all stakeholders can freely express their views on current and future policy directions.

During this consultation and the preparation of the draft Strategy key stakeholders should be invited to offer ideas for pesticide exclusion mapping, pesticide use protocols, unacceptable risk definition and continuous improvement indicators – all of which would be drafted by Council staff for inclusion in the IPM Strategy.

2. Refining the current position

While a position of cessation of pesticide use in all highly frequented public use areas is without complete risk there is potential to shift to a position of continuous improvement (Box 4).

Five out of the six overseas cases and all of the (seven) Australian government cases provided in Appendix 7 have some process of exemption or permit system in place to enable the agency to continue to meet its statutory obligations. A position of continuous improvement would therefore be consistent with actions in other parts of Australia and the rest of the world in that it retains the aspiration to cease or minimise the use of pesticides in a new frame of practicality, based on continuous improvement (Box 4). A position of continuous improvement would also allow adaptive management if desired outcomes are not realised.

Therefore, based on our experience in implementing the Resolution and learning from other countries and Local Government Areas in Australia it is recommended that a draft policy aspires, on a continuous improvement basis, to:

- cease pesticide use in a mapped pesticide exclusion zone representing high public use areas; and,
- minimise pesticide use elsewhere, while allowing Council staff to use pesticides responsibly, on the basis of an agreed protocol in any zone where pesticide use is necessary to retain the quality of ongoing services, the protection of public and staff safety, protection of biosecurity and existing infrastructure within a framework of responsible financial management.

This would be best implemented after a period for transition to allow staff sufficient time for information circulation.

Box 4. Continuous improvementS

Strategies of “continuous improvement” are well-accepted in many industries where a desired endpoint requires a period of transition due to:

- limits to alternative technologies or the research or resources required for their innovation or development and/or,
- a need for a suitable time-frame to establish stakeholder preferences regarding trade-offs in complex risk-benefit scenarios.

A strategy of ‘continuous improvement’ can allow a practice to be taken as far as possible along a trajectory of improvement towards a specific goal or target.

Successful implementation of the policy direction would require the development of:

- i. an Integrated Pest Management Policy that is ording consistent with a continuous improvement basis;
- ii. pesticide reduction zone mapping to provide certainty around the application of the policy to all public areas;
- iii. a set of protocols for decision-making around all pesticide use ;
- iv. practical measures of continuous improvements; and,
- v. an IPM Strategy that aims for cessation (in some areas) and pesticide minimisation (in others) on a ‘continuous improvement’ basis.

3. Development of the Policy and IPM Strategy

A draft Policy is being exhibited concurrently with this Directions Document to ensure strong and authentic community engagement and engagement with Councillors. The final Policy will guide the development of the IPM Strategy that would be evidence-based and based on robust

social engagement. The IPM Strategy would include the map of pesticide exclusion and minimisation zones and the protocols for pesticide use.

4. Mapping of pesticide exclusion and minimisation areas

The definition of ‘highly frequented public use areas’ has changed over time in response to debate and remains problematic. To manage public and Council staff expectations and avoid confusion about where pesticide use is to cease, it is recommended that the Integrated Pest Management Working Group oversees the creation of a digital ‘constraints map’ that clarifies boundaries within which pesticides are not to be used unless under approved protocols agreed after engagement with key stakeholders. That is, the mapping and protocol would be developed with input from staff and interested community stakeholders with the aim of achieving consensus about zone boundaries and allowing other input to map content.

It is recommended that the term ‘highly frequented public use areas’ is not used as a criterion for exclusion or minimisation zones because of the difficulty of its definition, although an effort should be made to come up with an understanding of areas in which potential exposure to pesticides to the public would be higher than other areas because of the site’s accessibility and the area’s degree of public use. The map would preferably use a term such as ‘mapped exclusion and minimisation zones’ to represent the following:

Exclusion zones:

- a) areas of potentially higher exposure to the public (e.g. town and village centres, playgrounds, bus stops etc.) where cessation is possible and appropriate; and,
- b) Additional sensitive areas’ (e.g. child care centres, nursing homes, nominated informal bus stops and other locations on the sensitivity register) even if not located in high public use areas.

Minimisation zones:

- a) all current areas not earmarked for cessation (e.g. public garden beds outside the centres of towns and villages, all bushland and biosecurity zones); and,
- b) areas currently earmarked for cessation but where this aspiration is not yet possible or appropriate e.g. (‘A-grade’ sports grounds, roadsides and roundabouts).

It is recommended that the map would be a living document, which is reviewed no more frequently than annually by Council’s managers, although additions to the sensitivity register would be updated immediately upon a new registration. The map would include a legend that would prescribe the situations where pesticides may be applied at the discretion of Council within a protocol that secures public safety, biosecurity and infrastructure obligations.

5. Protocols for pesticide use

It is recommended that future pesticide use by Council staff or contractors be governed by professional standards and discretion. This would require the development of a set of protocols that includes:

- (a) a process for objective evaluation of each situation against pre-determined criteria (e.g. Box 5); and,
- (b) a list of **threshold points** beyond which a pesticide use action is required (e.g. Box 6).

This set of protocols would be developed in consultation with Council staff and consultation undertaken with stakeholders. This would not only provide core guidance around pesticide decision-making for Council staff but would also provide comfort for community members who require a high level of transparency around pesticide decision-making.

Box 5. Examples of criteria useful for a decision tree:

Criteria for the development of a decision tree would need to be developed around the necessity, efficacy, practicality and acceptability of pesticide use, and other criteria that may emerge from the social engagement process.

Draft criteria for a set of protocols to guide the use of pesticide is likely to at least require consideration as to whether:

1. The task is necessary or highly desirable to manage threats to safety, biodiversity, community assets or amenity within a framework of responsible financial management;
2. There is no effective alternative, or the effective alternative diverts scarce resources from other high priority Council projects;
3. The pesticide has the lowest potential to cause harm, e.g. the lowest Poisons Schedule rating to achieve the efficiency level required;
4. The pesticide can be used in a way that does not present an unacceptable risk to the health of the public, the operator or the environment; and,
5. The benefits outweigh the risk by improved safety and environmental health, enhanced protection of a community asset or improved public amenity

Box 6. Examples of thresholds where a pesticide might be considered in an exclusion zone:

1. obscuring of road sight-lines and traffic control devices e.g. barriers and safety signs;
2. need for drainage maintenance for flood mitigation purposes;
3. Removal of pest animals to avoid risk to human health e.g. rodent outbreak
4. Occurrence of a serious new and emerging biosecurity pest (e.g. Fire Ants); and,
5. Timely removal of threat to children's safe play (e.g. wasps nest in play equipment or unacceptable level of bindii).

6. Monitoring and reporting 'continuous improvement'

Monitoring and reporting continuous improvement is likely to require goal-setting by each Directorate of Council that may use pesticides. Pesticide outputs (and any short-term outcomes) should be reported annually, with longer term outcomes reported on a 3-yearly basis at which times goals should be reviewed in keeping with best practice adaptive management.

Qualitative indicators that measure the potential of a pesticide to achieve beneficial outcomes are likely to be more useful than quantitative records of the total amount of pesticide used. Recording pesticide reduction will be of some value, but will not always be a reliable measure of continuous improvement, particularly in the short term because:

- a) reduction to a minimal level may be readily reached in some parts of Council's operations, allowing only relatively small further reductions through improved methodologies;
- b) frequency of treatment may be higher or lower in some years due to natural variation in growth conditions, variation in pest animal abundances or a high biosecurity threat emerges that requires rapid action;
- c) bush regeneration sites involve wetland or grassland where weeds cannot be reduced by shading from trees; and,

The reduction in numbers of times pesticide is used (i.e. frequency reduction) is also not a reliable measure. This is because a lower frequency of pest control follow up, for example, can actually fail to reduce a pest if a higher frequency is needed. In this regard, sub-optimal frequency can lead to a need for more repetitive use of herbicides over longer periods when more timely applications can reduce this need.

Reduction in the overall amount of pesticide and frequency of its application, therefore, needs to be balanced against other goals including threats avoided or service provided. Complex

metrics for calculating costs and benefits should be avoided by giving Council managers discretion to report against minimisation goals in a common-sense manner.

Conclusion

Changing pesticide use operations for the better is not an easy challenge, but substantial progress has been made in the last five years. Further progress can be achieved by Council, stakeholders and community working together. This Directions Document offers all parties a pathway to continue to aspire to maximum reduction of pesticide use on Council managed land, while providing staff a capacity to continue to meet Councils obligations and responsibilities.

With the 5-year timeline of Resolution 13-621 having expired (i.e. by 2018), the development of a Policy is required to reassert the Resolution's aspiration to cease the use of pesticides (in designated public areas) and minimise their use (in all other areas) on a continuous improvement basis for the long term. It is recommended that the Policy includes enablement of Council staff to have discretionary use of pesticides, under strict protocols, in any area where alternative practices (biological, horticultural, physical or mechanical) are unavailable and pesticides are required to meet Council's obligations for public or operator safety, biosecurity and the protection of infrastructure within a framework of responsible financial management.

Such a policy will underpin the development of Integrated Pest Management Strategy that will include a mapped pesticide exclusion zone and pesticide minimisation zone and a protocol for decision-making for pesticide use. To achieve this, genuine social engagement that allows for community discourse and a two-way information exchange is needed to optimise the likelihood of a balanced outcome for Byron Shire.

Development of Integrated Pest Management Strategy

Outcomes Logic

OBJECTIVES/OUTCOMES/OUTPUTS
<p>Objective:</p> <p>Byron Shire Council is committed to the sustainable management of pests by supporting a continuous improvement approach to integrated pest management that pursues cessation of the use of pesticides in parts of Council managed land and minimisation in other area; while recognising there are circumstances where pesticides are at times required to ensure that Council is compliant with all relevant legislation and statutory requirements.</p> <p>Council can achieve this by:</p> <ol style="list-style-type: none">1. High quality stakeholder and community engagement throughout the planning and implementation process2. Adoption of Council’s Integrated Pest Management Policy that guides what is allowable in pesticide exclusion zones and pesticide minimisation zones3. Development and adoption of an Integrated Pest Management Strategy
<p>Outcomes:</p> <p>The impacts of pest (weeds and animals) on the natural environment, economic, social and cultural values of Byron Shire area have long been recognised. Pest species degrade natural ecosystems, impact on agricultural productivity, threaten biodiversity, impact on human health and interfere with recreation and cultural uses and values of an area. Managing these pest species is acknowledged as a priority in many existing management documents and works programs.</p> <p>Building on previous experience and investment, the following desired outcomes for an integrated pest management strategy in Byron Shire are identified.</p> <ul style="list-style-type: none">➤ Effective management of the pest species has commitment and coordinated effort and action by Council, a range of key stakeholders and the community.

- Pest management priorities and integrated pest management actions of all key stakeholders and community are coordinated in a manner compliant with all relevant legislation.
- Methodologies and practices continuously improve to cease or minimise the use of pesticides but where required, are used responsibly.

Our strategy is

- developed through consultation with stakeholders and Council work units.
- consistent with the priorities and directions set by higher order (National, State and Regional) pest management documents.
- establishes local priorities for species and areas to be managed and identifies required pest management strategies and actions, with implementation timeframes and responsibilities assigned.

Outputs:

1. Adopted Integrated Pest Management Policy
2. Adopted of an Integrated Pest Management Strategy

Project Schedule

Milestone	Proposed Date
Directions Document and Draft Integrated Pest Management Policy	April 2018
Communicate Directions Document and Draft Integrated Pest Management Policy (inc. 6-week public exhibition and engagement)	April-May 2018
Review submissions, finalise Integrated Pest Management Policy	May-June 2018
Adopt Integrated Pest Management Policy	June 2018
Develop Community and Stakeholder Engagement Plan	July-August 2018
Draft Integrated Pest Management Strategy	August 2018-January 2019
Communicate DRAFT IPM Strategy (inc. 6-week public exhibition and engagement)	February-March 2019
Review submissions, finalise IPM Strategy	March-April 2019
Adopt IPM Strategy	April 2019

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Glossary

Council managed land means land owned, occupied and/or managed by Byron Shire Council.

Minimisation means to use carefully the smallest amount of the least hazardous effective product, saving a pesticide application as a last resort wherever possible and appropriate.

Pesticide free means an area created and/or designated within which no pesticide is applied.

Pesticide means an agricultural chemical product as defined by the Agricultural and Veterinary Chemicals Code Act 1994, but for the purposes of this document, excludes registered biological agents and pesticide products approved for use in organic farming. Definition of pesticides covers, bactericides baits, fungicides, pesticides, insecticides, lures, rodenticides and repellents. Pesticides are used in commercial, domestic, urban and rural environments (Pesticides Act 1999).

Integrated Pest Management (IPM) A pest management strategy that carefully considers combinations of methods to attain long-term prevention or suppression of pests with minimum impact on human health, the environment and non-target organisms.

Pest means a species, strain or biotype of a plant or animal, or a disease agent, that has the potential to cause, either directly or indirectly, harm to (a) human, animal or plant health or (b) the environment (Biosecurity Act 2015).

Poison means medicines and chemicals (including pesticides), whether naturally occurring or synthetic, that are listed on the Poisons Schedule (Therapeutic Goods Administration 2017, Appendix 4).

Poison rating means the number given to a substance under the Therapeutic Goods Administration's Poisons Schedule (See Appendix 4)

Synthetic pesticide means a man-made substance registered with the APVMA that prevents, repels, alters or kills a pest.

Appendix 1. Council resolutions

[Adopted on 21 November 2013]

13-621 Resolved:

1. That Council develop a Shire Wide Integrated Weed/Pest Management Policy for Council owned and managed lands, and a Shire Wide Integrated Weed/Pest Management Strategic Action Plan for Council owned and managed lands in consultation with Council staff, community and experts in the field.
2. That the following are included within the vision of the Integrated Weed/Pest Management Policy:
 - a) An aspiration to reach the goal of ceasing the use of all non organic chemical based herbicides and the repetitive use of all non organic chemical pesticides, in highly frequented, public use areas, within 5 years.
 - b) Consideration that non organic chemical herbicides are the least preferred, though currently are, at times essential management option, and the process of managing weeds and controlling vegetation should be undertaken in a way that minimises adverse effects.
 - c) Promotion of the concept of best practice weed management, taking an integrated approach to the control of weeds and vegetation, and uses methods that have the least potential to adversely affect human health and the environment while achieving the desired outcome.
 - d) A statement outlining desired outcomes of the Policy.
3. That an *Integrated Weed/Pest Management Strategic Action Plan* considers:
 - a) A non organic chemical use audit for weed control, including an outline of where it is used, the types used and the current budget of use.
 - b) Increasing native plantings as a method of weed control.
 - c) An updated report every two years outlining progress of the goal of ceasing the use of all non organic chemical based herbicides and the repetitive use of non organic chemical pesticides, within 5 years, impediments to this target and possible options that have arisen and that this report compares the relative environmental costs & benefits.
 - d) Within a review, the investigation of different possible management options, within different areas and ecosystems and a prioritisation of areas to be targeted.
 - e) Possible cooperation with Universities for selecting waterway sites to monitor and test the impacts of using non organic chemicals, possibly as a research project as a case study.
 - f) Investigation of further opportunities to make significant reductions in non-organic chemical use, for example, rate incentives for organic farmers and subsidising responsible non organic chemical use training for farmers.
 - g) Investigation of using one park or open space within the Shire as a 'trial park' to engage community support and test non chemical methods.

4. That as part of the development of the Integrated Weed/Pest Management Strategic ActionPlan:

- a) A report be brought to council, within two months, considering the immediate cessation of mowing and brush cutting of all roundabouts in the Shire and incremental replacement with site appropriate maintenance free landscaping and that the report includes budget implications.
- b) A report be brought to council considering the implementation of an integrated weed/pest management program in all high use Council owned or managed public spaces, including parks, gardens, bus stops, schools, shopping areas, around signs and along natural water courses and drains within 6 months and that the report includes budget implications and an assessment of the applicability of non-chemical methods.

5. That Council writes to the NPWS:

- a) Requesting assurances that no aerial spraying or broad scale ground based spraying residue can contaminate Council or private land adjacent to NPWS controlled land, nor will have any adverse impacts on native flora and fauna or human health in these areas.
- b) Requesting they engage with the community to grow a community, ecological and nonchemical weed management group to assist with NPWS efforts to manage weeds in areas it is possible to do so.

6. That the funding for the proposed actions outlined, where not available in the 2013/14 budget, be considered for inclusion in the 2014/15 budget.

(Richardson/Wanchap)

Appendix 2. Our Use of Terminology

Some of the key terms used in the Resolution are difficult to use in practice because of their conflict with other terms in common usage and the difficulty of defining substances separately from the hazard they may pose. The question must be asked, what do these terms mean – and are there better terms that can be substituted to provide improved clarity and enhance communication?

‘Non-organic chemical based herbicide’. This term, while perhaps intended to mean chemicals that are not approved for use in organic farming, has conflicted meaning since the commercially available registered pesticides used by Council are, in the scientific sense, classified as organic compounds. While many of these occur in nature, ‘organic’ compounds as understood in industrial chemistry denotes some of the most hazardous substances created. These include the organo-chlorine pesticides (e.g. DDT, dieldrin) and most recently, organo-fluorine compounds such as the PFAS group of compounds which have polluted ground and surface waters in NSW, including around airports.

For some people, words such as ‘natural’, ‘organic’, ‘chemical-free’ or ‘low toxicity’ can mentally translate as ‘good’ as opposed to other words which translate as ‘bad’, such as ‘synthetic chemicals’, ‘chemical pesticides’ or ‘toxic pesticides’. Awareness of the nuances of language is important in communication since it is not uncommon for people to associated the idea of ‘natural’ to mean safe, or the word ‘organic’ to imply naturalness and hence safety. Curiously, this is a false distinction as elements like mercury [Hg] or arsenic [As] are both natural and highly hazardous substances. The use of the term ‘organic’ as a signal of that a food or substance is safe is commonplace in Australia and came about due to increased public consciousness about the wrongdoing of the chemical industry. This includes a memory of pollution disasters like that which occurred at Bhopal, India in 1984, where a half a million people were exposed to a toxic gas leak from a Union Carbide pesticide plant. People also remain conscious of the use of chemical warfare in Vietnam when *Agent Orange* was used against the civilian population. *Agent Orange* was a combination of substances including two herbicides that were commonly used in Australia for weed control. People’s memory of this can sometimes frame their assessment of pesticide risk and influence their understanding of the actual risk.

Recommendation:

It is recommended that Council staff use ‘pesticide’ in the way it is reflected in the NSW Pesticide Act, which classifies herbicides as a type of pesticide, not a separate class of hazardous substances. When Council refers to substances that are targeted for reduction and eventual cessation, the word ‘pesticides’ should be exclusively used and this should be interpreted as pesticides registered under the NSW Pesticide Act, the principal Act that governs Council’s legal responsibilities around pesticide use. However, pesticides approved for use in organic farming and those that are wholly based on biological agents are not included in the term ‘pesticides’ for the purposes of Byron Shire’s pesticides policy.

Terms referring to level of potential harm. While pesticides differ in their level of potential harm, terminology to convey this needs to be carefully applied. The use of the word 'toxic' can introduce confusion, since both naturally occurring and man-made substances are listed on the Poisons Schedule (Therapeutic Goods Administration 2017). Reference to the 'toxicology' of a herbicide, however, can be helpful as this invites further information on its acute (quick poison) or chronic (slow poison) form. The term 'hazardous' can also be helpful as it refers to the properties of a substance that make it potentially dangerous and/or poisonous, and allows for the communication of the range of potential health impacts, including cancer-causing properties as well as reproductive, immunological or endocrinal impact. Where the term 'hazard rating' of a pesticide is used however, this has a specific definition and a complex classification system under the Hazardous Chemicals Information System (Worksafe Australia 21012), a system used to guide the level of risk for the transport of a substance, rather than necessarily its potential to cause harm to people or the environment.

It is recommended therefore that the terms 'toxicology', 'hazard', 'risk' and 'potential to do harm' can be used as appropriate to the situation but that 'toxic' not be used except where appropriate from a scientific perspective. This approach will align with community concerns about the long term and hidden health impacts of many synthetically-produced chemicals, which in recent years have magnified and are causing concern among assessors and regulators world-wide.

**Appendix 3. Poisons schedule - Excerpt from Therapeutic Goods Administration
(2017) Standard for the Uniform Scheduling of Medicines and Poisons. No. 18 October 2017.
Therapeutic Goods Administration, Canberra.**

Poisons are classified according to the Schedules in which they are included. The following is a general description of the Schedules. For the legal definitions, however, it is necessary to check with each relevant State or Territory authority. (**Note:** Most pesticides used in Byron Shire fall into Schedule 5.)

Schedule 1.	This Schedule is intentionally blank.
Schedule 2.	Pharmacy Medicine – Substances, the safe use of which may require advice from a pharmacist and which should be available from a pharmacy or, where a pharmacy service is not available, from a licensed person.
Schedule 3.	Pharmacist Only Medicine – Substances, the safe use of which requires professional advice but which should be available to the public from a pharmacist without a prescription.
Schedule 4.	Prescription Only Medicine, or Prescription Animal Remedy – Substances, the use or supply of which should be by or on the order of persons permitted by State or Territory legislation to prescribe and should be available from a pharmacist on prescription.
Schedule 5.	Caution – Substances with a low potential for causing harm, the extent of which can be reduced through the use of appropriate packaging with simple warnings and safety directions on the label.
Schedule 6.	Poison – Substances with a moderate potential for causing harm, the extent of which can be reduced through the use of distinctive packaging with strong warnings and safety directions on the label.
Schedule 7.	Dangerous Poison – Substances with a high potential for causing harm at low exposure and which require special precautions during manufacture, handling or use. These poisons should be available only to specialised or authorised users who have the skills necessary to handle them safely. Special regulations restricting their availability, possession, storage or use may apply.
Schedule 8.	Controlled Drug – Substances which should be available for use but require restriction of manufacture, supply, distribution, possession and use to reduce abuse, misuse and physical or psychological dependence.
Schedule 9.	Prohibited Substance – Substances which may be abused or misused, the manufacture, possession, sale or use of which should be prohibited by law except when required for medical or scientific research, or for analytical, teaching or training purposes with approval of Commonwealth and/or State or Territory Health Authorities.
Schedule 10 (previously Appendix C).	Substances of such danger to health as to warrant prohibition of sale, supply and use - Substances which are prohibited for the purpose or purposes listed for each poison.

(Appendix 4 continued...)

PRINCIPLES OF SCHEDULING

Poisons are not scheduled on the basis of a universal scale of toxicity. Although toxicity is one of the factors considered, and is itself a complex of factors, the decision to include a substance in a particular Schedule also takes into account many other criteria such as the purpose of use, potential for abuse, safety in use and the need for the substance.

This Standard lists poisons in ten Schedules according to the degree of control recommended to be exercised over their availability to the public.

Poisons for therapeutic use (medicines) are mostly included in Schedules 2, 3, 4 and 8 with progression through these Schedules signifying increasingly restrictive regulatory controls.

For some medicines and agricultural, domestic and industrial poisons, Schedules 5, 6 and 7 represent increasingly stricter container and labelling requirements with special regulatory controls over the availability of the poisons listed in Schedule 7. Products for domestic use must not include poisons listed in Schedule 7.

Schedule 9 contains substances that should be available only for teaching, training, medical or scientific research including clinical trials conducted with the approval of Commonwealth and/or State and Territory health authorities. Although appearing as a Schedule in this Standard, the method by which it is implemented in the States and Territories may vary.

Schedule 10 (previously Appendix C) contains a list of substances or preparations, the sale, supply or use of which should be prohibited because of their known dangerous properties.

Substances in products which have been considered for scheduling, but have been exempted from this Standard, may be listed in either Appendix A (general exemptions) or Appendix B (substances considered not to require control by scheduling).

The full poison schedule is available at <https://www.tga.gov.au/publication/poisons-standard-susmp>

Appendix 4. Background detail

On 21 November 2013, Council resolved (13-621) to develop a shire wide Integrated Pest Management Policy and Strategy (Appendix 1). In part response, the Australian Wetland Consulting Pty Ltd prepared the preliminary draft Byron Integrated Weed Management Strategy March 2016 (preliminary draft Strategy) in consultation with Council staff, community and experts in the area of pest management.

On 4 August 2016, Council resolved (16-362) to:

1. Peer review the preliminary draft Integrated Weed Management Strategy against Council Resolution 13-621 to ensure its compliance and that a detailed costed implementation plan be prepared to inform Council's Financial Sustainability Plan, and that this work be reported to Council along with the draft Strategy for Councils consideration.
2. Consider an allocation of \$20,000 in the quarterly budget review to undertake the peer review and detailed costed implementation plan.

On 1 July 2017 the Biosecurity Act 2015 and Biosecurity Regulations 2017 commenced. This provides specific legal requirements for state-level priority weeds and high-risk activities. The Biosecurity Act 2015 and Biosecurity Regulation 2017 are likely to have significant social, economic and environmental implications within Byron Shire, particularly in light of Council Resolution 13-621.

In response, an Integrated Pest Management Working Group (the Working Group) represented by Council staff from Open Spaces, Infrastructure Services, Sustainable Environment and Economy and representatives from Landcare was established. The initial brief of the Working Group was to undertake a peer review of the preliminary draft Strategy against Council Resolution 13-621. In June 2017, the Working Group completed a review of the preliminary draft Strategy which concluded that the preliminary draft Strategy partially aligned with Council Resolution 13-621. It also considered the [Support Document](#) on the topic of glyphosate (APVMA 2017) which found no justification for altering its advice regarding safety recommendations for the use of glyphosate.

In the light of Council's on-ground experiences over the last five years, the Working Group sought to find the point of balance between the two main elements of the Resolution: the aspiration to cease the use of pesticides within five years in highly frequented public areas and the acknowledgement that at times pesticide use was a necessary if least preferred option. It became clear that a case and rationale for reconciling these ideas needed to be clarified in a Directions Document prior to development of an Integrated Pest Management Policy and Strategy.

Appendix 5. New Legal Requirements and implications for Byron Shire

As part of integrated pest management, it is imperative that Council meet its legislative and regulatory requirements. While the preliminary draft Strategy provides a comprehensive summary of the planning context for an integrated pest management approach (AWC 2016:7) the *NSW Biosecurity Act 2015* and *NSW Biosecurity Regulations 2017* have become law

The *NSW Biosecurity Act 2015* consolidated fourteen pieces of legislation relating to biosecurity including the *Noxious Weed Act 1993*. The Act and its Regulations will continue to provide specific legal requirements for state-level priority weeds and high-risk activities. This has direct relevance to Byron Shire.

Important elements of the Act to be considered by Council are as follows.

A fundamental principle of the NSW Biosecurity Act 2015 is that biosecurity is everyone's responsibility. **All land managers, regardless of whether on private or public land, have the same responsibilities for managing all pests (i.e. weeds and pest animals).**

Control Orders - include weeds that are subject to a Control Order for the purpose of eradication. Control Orders are proposed as required to address subsequent eradication campaigns where appropriate. [See Weed Control Order 2017 (Part 6 Division 1) under the NSW Biosecurity Act.]

Biosecurity Zones - are created to allow on-going strategic management. The zones are aimed at containment but each species may be subject to recommended measures tailored by the region either within the zone or outside it.

A Bitou Bush Biosecurity Zone has been identified between Cape Byron and the Queensland-New South Wales boarder. Eradication of the weed or if that is not practicable, destroy as much of the weed as is practicable and suppress the spread of any remaining weed will be mandatory. [See Part 5 of the draft *Biosecurity Regulation 2016*].

Mandatory Measures - are used where specific action is required to mitigate the biosecurity risk of an activity. The mandatory measures include prohibition on certain dealings - including Weeds of National Significance (Clause 29), parthenium weed carriers - machinery and equipment (Clause 31) and duty to notify of importation of plants into the state (Clause 30). [See Division 8 of the draft *Biosecurity Regulation 2016*]

Biosecurity Direction - may be given to a land manager as a general biosecurity direction or an individual biosecurity direction that must be complied with e.g. for the purpose of eliminating the biosecurity impact posed by Bitou Bush within the Bitou Bush Biosecurity Zone [See (Part 9 Division 2) under the NSW Biosecurity Act.]

Appendix 6. Additional case studies for Byron Shire Council



Love our Garden Beds

Overview

The need

Rarely is a weedy plant a beautiful plant and they can make our CBD areas look untidy. It is desirable to support a global trend to decrease the use of pesticides but continue to present well maintained aesthetically pleasing and functional garden beds for our residents and visitors.

Current situation

The use of pesticides has ceased and has been replaced by the use of a steam weeder and cleaner as well as physical control of pests combined with re-directing foot traffic on streets and road pavements within CBD areas.

Current benefit

Risk of pesticide exposure removed for our residents and visitors while retaining high quality streetscapes that have the potential to offer a range of benefits to residents and other users.

“Our team continuously seek to provide cost-effective, sustainable and aesthetically pleasing garden beds”

— Tino Kraus, Better Byron Team

Verges in town centres and along some major roads are maintained by Council staff as part of the streetscape.

Visitors and residents will increasingly require greater provision of safe and convenient walking access to neighbourhood shopping and good connectivity across the CBDs.

Weed and unwanted general growth of vegetation in CBD garden beds are undesirable, impacting on aesthetically pleasing and functional garden beds.

Implementing improvement

Eight CBD areas across Byron Shire are now pesticide-free.

Council staff have achieved this outcome by hand weeding, steam weeding and the liberal use of mulch, improved plant species selection and installation of garden bed edging.

Garden edging typically extends several inches above and below ground level along the garden bed. Edging adds aesthetic benefit to the streetscape; defines the garden bed and pathway, retain soil and mulch in the garden, and reduces foot traffic into garden beds that increases soil disturbances and damages planting. Edging also makes mowing adjacent to garden beds easier and prevents grass from spreading into the garden beds.



A steamy affair

Overview

The need

It is desirable to support a global trend to decrease the use of pesticides but continue to present well maintained aesthetically pleasing and functional CBD areas for our residents and visitors.

Current situation

Putting the heat on Council's commitment to ceased the use of pesticides on kerbs-and-gutters, pavements within CBD areas and around children's playgrounds

Current benefit

Risk of pesticide exposure removed for our residents and visitors while retaining high quality streetscapes that have the potential to offer a range of benefits to residents and other users.

“Byron Shire Council will continue to lead the region in finding innovative and effective ways to cease and/or minimise the use of pesticides in our community.”

— Phil Holloway, Director Infrastructure Services

Council has 247 km of kerb-and-gutter. Traditionally, the common method used for hard surface weed control has been to through an integrated management approach including physical means and the application of pesticides i.e. herbicides at set times in the growing season. Targeted application and more effective and efficient use of pesticides can be achieved by flexible timing of applications based on monitoring, and the inclusion of alternative methods can minimise pesticides use. However, there are concerns about the use of pesticides in high use public areas such as CBDs due to possible exposure to our residents and visitors to potentially harmful chemicals.

Implementing improvement

In 2015, Council adopted the use of a steam weeder-and-cleaner to supplement other pest management methods to progressively work towards cessation of pesticide use in high public use areas. The steam weeder method is effective at targeting the above-ground parts of the plant rapidly and mainly destroys the surface parts of the weed; but, depending on the weed species, between 2-4 repeat treatments are required. For only some weed species steam weeding may penetrate the root systems, thus killing the weed entirely.

The use of the steam weeder-and-cleaner is now applied to kerbs-and-gutters and pavements within CBD areas across Byron Bay, Mullumbimby, Brunswick Heads and Bangalow, all children's playgrounds, all formal bus shelters and around the hard infrastructure at selected sports grounds. An added bonus is that Council is also able to use the steam weeder-and-cleaner to clean playground equipment and picnic tables.

Adopting the supplementary steam weeder-and-cleaner as a method to control weeds has reduced the risks associated with pesticide use but it is more costly. In future developments, many weed problems could be addressed or minimised at the design stage (e.g. using asphalt instead of slab or crazy paving). The majority of weed problems in paths and roadways occur on hard surfaces at cracks or joints in the surface where there is a build-up of detritus, which provides a substrate for weed seeds to germinate. If weeds are left untreated, they will degrade the surface leading to costly repair work.



Optimising bushland recovery

Overview

The need

A Technical Committee within a funding body generally assesses the merit of a project proposal by using an assessment criteria specific to each grants program. A key criterion is often value for money and evidence base for proven methods. Funding bodies such as the NSW Environment Trust understand that Byron Shire is part of only 15 biodiversity hotspots in Australia and one of 36 recognised internationally.

Current situation

Council staff particularly bush regenerators maintain a capacity for the judicious use of pesticides in areas not highly used by the public.

Current benefit

Council has secured \$2.4M of external funds to protect and enhance our unique biodiversity. This has enabled Council to provide measurable benefit and avoid time consuming and environmentally problematic outcomes.

“Byron Shire is an area with extremely high levels of unique biodiversity combined with very high levels of threats to that biodiversity. Ecological restoration is key to the sustainable future of such areas.”

— Clare Manning, Biodiversity Officer

Byron Shire has a highly motivated and active community that works in partnership with industry and all tiers of government to implement numerous projects to protect, restore and rehabilitate natural ecosystems. This outstanding and highly valued work is done on both private and public land. Much of it is focused on removing weed in a manner that facilitates the regeneration of native plants, while planting is also carried out where it is needed to strategically rebuild habitats.

Both approaches employ the judicious use of pesticides to optimise value for money in meeting the biodiversity targets of funding agreements, although Council staff acknowledge community concerns about the use of pesticides in the environment.

Implementing improvement

Where such work occurs on Council-managed public land in the Shire and is carried out by Council staff, the staff work conscientiously to minimise the risk of pesticide use through a range of initiatives. These include: using manual methods where these are as efficient as herbicide use; improving the timeliness of treatments (to encourage rapid recolonization by natives); and selecting the lowest risk pesticides available for the task at hand. Public and operator safety and environmental health protocols are rigorously observed.

Volunteer groups are active in the Shire and also minimise their use of pesticide; in some cases ceasing its use altogether.

If Council were to cease all use of pesticides, it is very unlikely that sufficient numbers of volunteers would be available to take on the current work or to meet future challenges. To maintain external funding to employ staff, Council would need to demonstrate to funding bodies that the same (or better) outcomes for the same amount of funds can be achieved. Indeed, feedback from major funding bodies suggests that ceasing all use of pesticides may be risky from both a funding *and* ecological perspective, considering the reduction in area treated that would result from such a policy.

Appendix 7. Pesticide reduction initiatives internationally and in other parts of Australia

EUROPE

In 2009, the European Union Member States approved a Directive [2009/128/EC] which aims for the sustainable use of pesticides. The Directive recommends that appropriate risk management measures be established and gives preference to low-risk pesticides and biological control measures. It also prescribes the minimisation or prohibition of pesticides in sensitive areas such as public parks and gardens, sports and recreation grounds, school grounds, children's playgrounds, and in close vicinity of aged and health care facilities (EC 2009).

One of the most widely used pesticides in sensitive areas is the herbicide glyphosate. In March, 2015, the International Agency for Research on Cancer (IARC) re-classified glyphosate as 'probably carcinogenic to humans'. Subsequently, on 11 July 2016, the European Commission voted for restrictions on the use of glyphosate-based formulations in public parks, playgrounds and home gardens and for pre-harvest application. A subsequent extension to the registration of glyphosate-based herbicides in Europe saw these restrictions reapplied, however no restrictions apply to its other uses to manage weed growth on other public amenities, forestry and aquatic environments.

The following is a summary of information on how several European cities and towns responded to the 2009 EC Directive. The response largely took the form of prohibiting pesticide use in public areas and permitting some use for essential purposes under strict exemption protocols. The information is largely derived from the website of the European non-government organisation, Pesticide Action Network. (See <http://www.pesticide-free-towns.info/policy-strategies>).

Belgium. Two regions (Flanders and Wallonia) and one city (Brussels) have either already implemented, or are in the process of implementing bans on the use of pesticides in public places, particularly institutions that host vulnerable groups such as schools, aged care homes and hospitals. The transition period to 'no pesticide use' ranges from 5 years in Wallonia to 10 years in Flanders. Exemptions are managed through a permit system that allows pesticide use in the case of particularly problematic species or particular service standards, such as public health or safety, ecological restoration or recreational amenity.

Germany. There is a general policy of prohibition on the use of pesticides on non-agricultural land in Germany except under permit, e.g. safety reasons by railway agencies. Prohibition has impacted budgets across all levels of government and it is open to review in the future.

Denmark. Pesticides were to be prohibited in public spaces after an 8 year transition period but the transition period has now been indefinitely extended. From 2010 on, Danish cities have been required to report their pesticides use to the Ministry for the Environment every three

years. In total, 25.7 tonnes of pesticides were used in public spaces in Denmark in 1995, compared to 2.3 tonnes in 2013, signalling a reduction in usage of 91%.

France. As of 1 January 2017, pesticide use in parks and other public areas has been banned, except in emergency situations when the control of invasion by noxious species is required. Pesticide usage on railway lines, in airports and on roads is not subject to the ban.

OTHER OVERSEAS COUNTRIES

Canada.

In 2004, the City of Edmonton drafted an Integrated Pest Management Policy that included prohibition after an 11-year transition period. After that time, exemptions were allowed. The policy aimed to eliminate non-essential uses of pesticides on city-owned land, while recognizing that there are situations where pesticide use is required. For example, pesticides may be used to remove or control noxious weeds, maintain standards of golf courses, bowling greens, athletic facilities, sports grounds, cemeteries, and parks used for high profile events. They can be used to protect against damage to city infrastructure, such as sewer pipes, storm water facilities, concrete surfaces, and for fire safety along railway lines (J. Gross 2017, pers. comm., 8 February).

New Zealand.

The City of Auckland Weed Management Policy for Parks and Open Spaces (City of Auckland 2013) seeks to minimise the use of pesticides, particularly herbicides, while still achieving desired control of weeds. To this end, the council continuously revises weed management practices to maximise efficiency and effectiveness, while minimising the use and adverse effects of herbicides. The council is achieving this through restriction on the application of herbicides in specific areas (e.g. children's' playgrounds) or at specific times such as not within 48 hours prior to an event on sports fields. The council acknowledges that minimising the use of herbicides changes the level of service and therefore, as part of the policy and strategy, an objective includes stakeholder and public education as to the risk and benefits.

AUSTRALIA

Apart from Byron Shire, several local governments within Australia have introduced resolutions or policy to cease and/or minimise the use of pesticides, particularly herbicides. Many other local government areas are currently in a period of discussion and debate about the issue.

In Western Australia, the cities of Fremantle and Nedlands have stopped using herbicide routinely in street maintenance. A number of councils in Western Australia are considering policy to cease and/or minimise the use of glyphosate only, and the Eastern Metropolitan Regional Council is currently trialling an alternative weed spraying technique using steam.

In Victoria, the Yarra City Council in Melbourne has indicated its support for continued use of steam weeding in the town and village centres despite increase cost. In contrast, Mount

Alexander Shire Council rejected a petition from Castlemaine residents calling for an end to glyphosate use, on the basis that a steam weeding trial conducted in 2014 proved not to be economically viable.

Four individual local governments provided more detailed information about their approach to reducing pesticides in public areas: Willoughby City Council, Inner West Council, City of Fremantle and the Shire of Augusta, Margaret River.

Willoughby City Council (located within the greater Sydney area) disused the aspiration of ceasing herbicide use within the Shire, but an internal assessment identified that the financial and environmental risk of not using herbicide outweighed the environmental risk of using it (Pers. comm., C. Williams, Project Coordinator, WCC, 23 Nov 2017). A policy of '*reduction to the extent possible*' was adopted, with emphasis on Integrated Pest Management (IPM). While pesticides, including glyphosate remain a tool in the IPM toolbox, pesticide use is minimised wherever possible through IPM techniques.

Inner West Council (also located within the greater Sydney area) is a recent amalgamation of Leichhardt, Marrickville and Ashfield Councils. As it is still in a period of integration and transition, key information on the councils collective area of management is currently unavailable (John Summergreene, Parks and Sportfields manager, pers. comm. 18 Jan 18). Nonetheless, by way of background, when the IARC announced glyphosate to be a '*possible carcinogen*' in 2015, it triggered a 'cease immediately' order within Leichhardt Council. Trials using pine oil and other alternatives were undertaken. It was found that repeated treatments were required and its use was far more costly than using registered pesticides. In addition, the APVMA rejected the findings of the IARC and reported there was insufficient evidence to support any change to their advice on the safety and use directions for products containing glyphosate (APVMA 2017). As a result, Marrickville and Ashfield sectors of this LGA started using glyphosate again (John Summergreene, Parks and Sportfields manager, pers. comm. 23 Nov 2017). However they do use the steam-weeding method in high visibility public areas such as shopping centres, children's playgrounds and near childcare centres. The Leichhardt sector retain the glyphosate ban and engage a contractor to use alternative methods, although these have been found to be costly and to have low efficacy (John Summergreene, Parks and Sportfields manager, pers. comm. 23 Nov 2017).

The City of Fremantle is located within the greater Perth area; and, since 1997, has debated the efficacy of ceasing and/or minimising the use of pesticides, particularly herbicides. In 2000-2002, the City undertook steam and hand weeding trials of pavements and kerbs, and found a 120% cost increase (Smith 2016). Despite the increased cost, in 2004 the City committed to a Chemical Free Weed Management Program that applied to all pavements and kerbs with annual efficiency and financial reviews (Smith 2016). Although a consultation process in 2005 showed that approximately 2.5% of the population were opposed to the application of herbicides, the program was expanded to include priority Regional roads and in town and village centres. The 2015-16 annual review showed that between the period 2000-2015, the Chemical Free Weed Management Program had a cost increase of 275% from \$109,000 to \$300,000 per annum

(Smith 2016). The increase cost together with questions about the responsible use of water (as used by steam weeding) triggered a review of the Chemical Free Weed Management Program, which continues to date.

In 2016, Council resolved to review an IPM approach that aims to better align the use of pesticides with legislative requirements and an agreed level of service for the community. As part of the review, the City developed a comprehensive community and stakeholder communication and engagement plan. History has shown that community and stakeholder communication and engagement is imperative to Council's decision making with regards pesticide use (Katrina Sash, Open Spaces, pers. comm. 11 Jan. 2018).

Shire of Augusta, Margaret River *is located in south-west corner of the South West region of Western Australia with a population of around 14,258 and a rate base of 9,613. The Shire comprises 2,879 km² of a mix of rural and urban areas with 112,889.4 ha of bushland (most of which is not actively managed) as well as 2,935 ha of open space and reserves that includes 55.4 ha of recreation areas and 29 playgrounds.*

In 2016, the Shire reviewed its weed management practices and herbicide use, and followed this with a report that focussed on the minimisation and eventual cessation of glyphosate, based on risk assessment and investigation of appropriate alternative weed management techniques. In the period 2016-17, the Shire undertook several trials of alternative weed control techniques, including steam and hand weeding trials of pavements and kerbs and the application of *Bioweed* containing pine oil. Initial results suggest that while steam weeding may have a suitable application for managing weeds on pavements and kerbs, the method was unlikely to be fully adopted as it was not deemed as cost effective as using herbicides to manage weeds. Additionally, *Bioweed* had limited effectiveness and its application raised concerns regarding public and operator eye-and-lung irritation. Today, the Shire uses an IPM approach that includes the use of pesticides including glyphosate and steam weeding on the main high streets only, in the towns of Augusta and Margaret River. Should alternative products or new technologies become available in the future, these options may be reassessed for their suitability to complement the existing approach to pest management (John McKinney, Coordinator Environment & Landcare Services, pers. comm. 18 Jan 2018).