Urban Ecological Restoration: The Invisible Challenges

Despite significant urban development and often 'less than ideal' land use decisions by our forefathers (as exemplified in the adjacent photos), our cities retain biological, cultural and social importance and are home to a wide variety of flora and fauna. However, help is needed to restore and enhance urban ecology as it is under threat from the spread of invasive weeds.

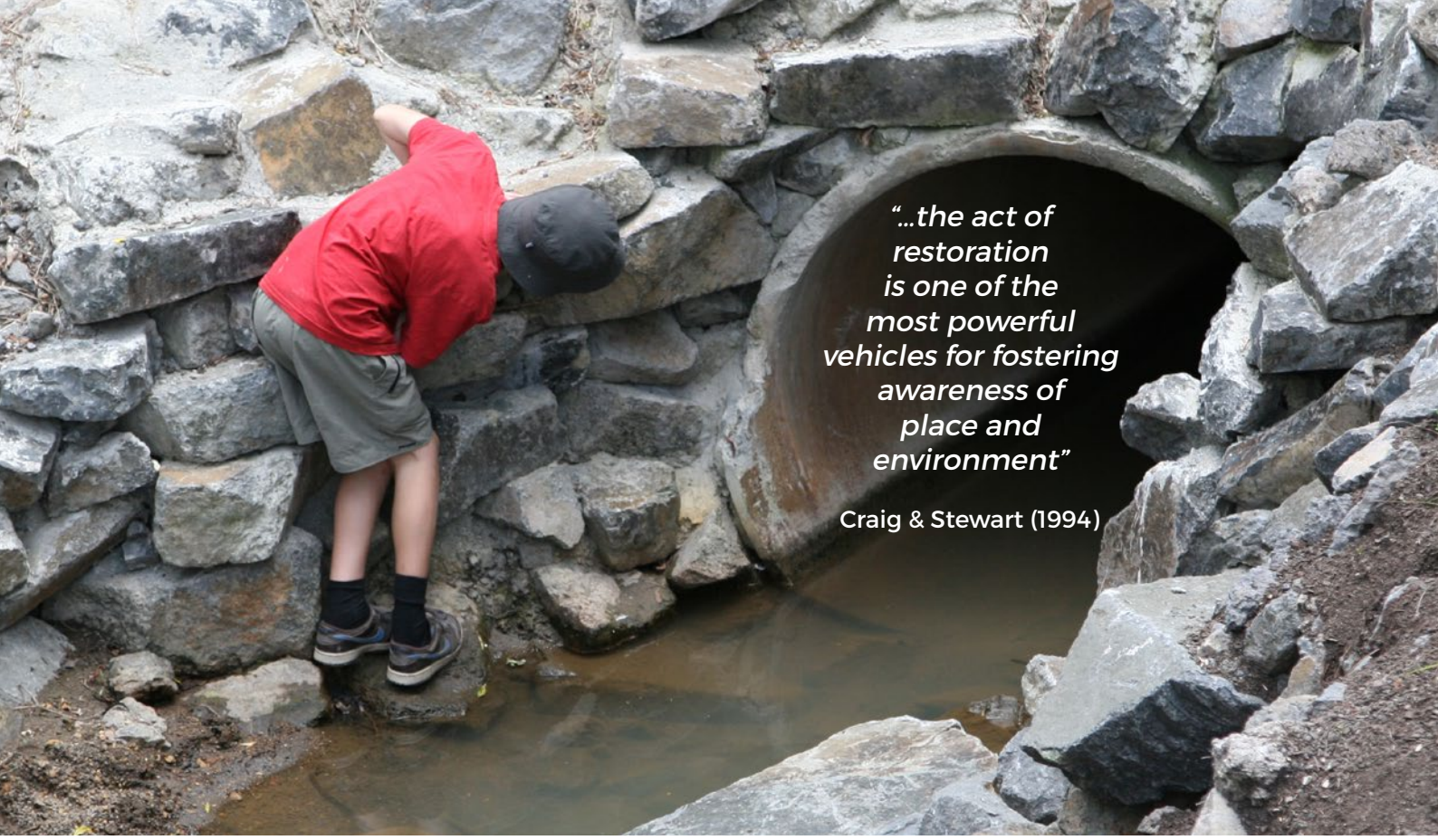
Ecological restoration initiatives in our parks and open spaces are often well-supported (and even driven) by the community. But all the good intention in the world can be frustrated or even derailed by what we've termed "invisible challenges", which are those intangible or unexpected complications at restoration sites such as stakeholder expectation, diversity of cultural values, contamination, archaeology and planning rules.

These challenges can lead to added expense and delay for these projects, which on the surface appear to be quite simple.

Drawing on recent project examples, we explore several pitfalls and difficulties associated with ecological restoration works around our cities and discuss how these can be avoided or managed so we can get on with the good work.

Rubbish dumping down stream banks

Artificial channel devoid of vegetation



WHAT IS URBAN ECOLOGICAL RESTORATION AND WHAT ARE THE BENEFITS?

For the purposes of this discussion document, **Urban Ecological Restoration (ER)** projects refer to those within the city limits that are focused on removal or control of weeds, and replacing them with native plants and trees. To be holistic, you could very well include pest eradication and vegetation of open grassed spaces here too.

The benefit of ER projects to **habitat** is generally well accepted, additionally they provide value to the surrounding community through improved amenity and **connection with nature**. The time-lapse photos to the right are at Te Auaunga Oakley Creek – the 'before' shot was taken in 2006 and the 'after' just 9 years later. Quite a remarkable change in such a short time.

It's probably no surprise that restoration of riparian margins contributes to **healthy functioning of streams** – through the roles of sustaining water quality, managing flood flows, limiting soil erosion, maintaining in-stream biodiversity, filtering nutrients and toxins from surrounding land use, and even mitigating the impacts of climate change. This is becoming more readily recognised within management and policy frameworks for the role of riparian restoration in improving biodiversity, ecosystem function and supporting the human population[1].

But further to these physical benefits, restoration of such sites can create great places just to hang out, play with kids, and appreciate nature. Getting the community involved in ER projects helps **foster a conservation ethic** for generations to come.

The photo above was taken at La Rosa Stream in West Auckland following a major stormwater pipe day-lighting and planting project, which created a space where kids are encouraged to interact with the environment. You can see this lad's inquisitive nature, it's like he's trying to work out *"where do streams come from?"*

MU3A South Riparian & Slope 2006-2015

The new breed of environmental scientists developing their conservation ethic at Te Auaunga Oakley Creek.

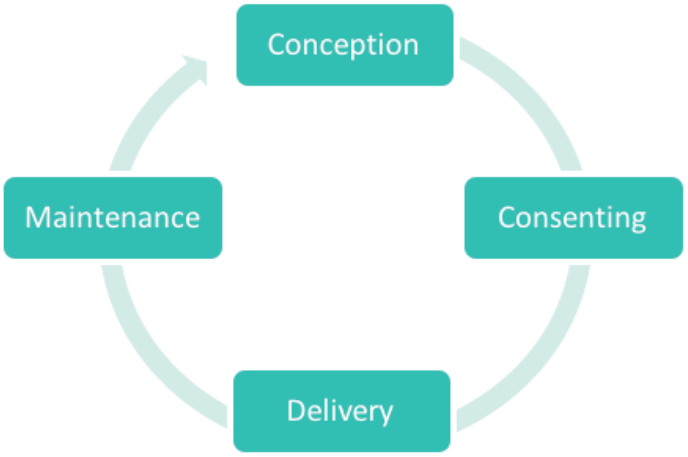
Pro-active help and **buy-in from the community** is particularly important when trying to restore habitats and fight the spread of noxious weeds. The good news is that there are plenty of people out there who have recognised the issue and are keen to get involved in Urban ER work.

The problem is...

But sometimes all the good intention in the world can be frustrated or even derailed by what we've termed **"invisible challenges"** that can crop up throughout the life-cycle of a project.

All of a sudden, a venture that appears relatively simple from the outside; *How hard can it actually be to pull out weeds and plant some trees*?... can hit challenges that create delays, add significant cost and even threaten the overall success or viability of a project.

The ER project life cycle



In this discussion paper, we're going to take a brief look at a few of these challenges, roughly following the chronology of a project from Conception through to Consenting, then Delivery of the Physical Works and Ongoing Maintenance, offering some suggestions along the way as to how these pitfalls can be avoided or managed so we can get on with the good work.

PROJECT CONCEPTION STAGE

There are plenty of parks and open spaces within our cities that present us with opportunities to recapture lost or degraded environments. But right from the conception of a project, there are potential pitfalls to consider and plan for.

Pitfall: Balancing expectations of stakeholders

Within an ER project you will typically have a number of stakeholder groups, and each of those groups can have different objectives within the common goal of 'restoration'. Even different departments within the same Council can push a variety of opinions regarding the best way to do things.

Ecological restoration means different things to different people, and it's a **careful balancing act** from the get go.

For example, is the project influenced by CPTED principles, Universal Access Design, biosecurity, stormwater function, provision of cultural resources or by creation of amenity pace?

Balancing these drivers may mean the design is not 'pure ecology', which means the planting mix won't look quite the same depending on which influences are relevant.

A **lack of collaboration** between groups or within organisations can also frustrate restoration efforts. An example that came to light within the media recently was when contractors sprayed herbicide on what they thought was roadside weeds, but was actually a wild flower project designed to encourage bee populations.

Collaboration issues can also manifest when a project crosses jurisdictional boundaries, such as when working on private land versus public land. A Council's Bio*security* team may have a mandate to help in private property, but the same Council's Bio*diversity* team may be focused on public land. So when an ER project comes along that spans both private and public property, it can make the coordination of design or works a bit tricky.

In another example, the position of Mean High Water Springs meant that organisers planting along an estuary next to a Council Reserve also had to go through the rigmarole of seeking permission from the Crown. You can end up with the situation where planting in a spot has one owner but only half a metre away, has quite a different owner with their own unique processes and protocols to consider.

But ecology doesn't recognise these abrupt changes, and pests cross boundaries. A rat certainly doesn't distinguish between private and public land.

So what's the solution? Well in brief, we'd suggest **early identification** and **engagement with stakeholders. Develop partnerships. Coordinate. Collaborate.**

Despite the challenges, it's definitely worth the balancing act with stakeholders to improve the health and well-being of our urban environments.

Pitfall: Not sufficiently providing for Te Ao Māori

Although ER that improves the health of an environment is often naturally aligned with Te Ao Māori, i.e. the Māori world view, Tangata Whenua concerns can either be overlooked or assumed during projects.

In her 2003 paper on the Oruarangi Creek, Dr Michelle Mills puts it like this:

"In spite of the fact that community-based programs give de facto recognition to an ethos typically espoused by indigenous peoples, the concerns, values and localised knowledge of indigenous people generally remain excluded from the restoration process" [2]

Which is a particularly articulate way of saying – communities may be doing generally the right thing from a conservation perspective, but **without properly including Tangata Whenua** in the process.

Despite the legal mandates contained in the Treaty of Waitangi, the Resource Management Act and Local Government Act, engagement with Iwi can unfortunately be left to the last minute, or seen as a hoop to jump through in order to get planning permission. And even if the physical realm is well-managed, consideration of the intangible and spiritual is often overlooked. This leads to traditional Māori values and knowledge being excluded, and Iwi/Hapu left feeling aggrieved. To quote the Auckland Unitary Plan:

"Mana Whenua values are not necessarily associated with archaeology, particularly within the highly modified urban landscape where the tangible values may have been destroyed or significantly modified… Sites and places of significance to Mana Whenua have intangible cultural values in association with historic events, occupation and cultural activities… and may be subject to special protocols." [3]

Without Iwi engagement in an ER project, damage to the intangible cultural landscape may be done without project managers even realising. An example of this was when weeding and planting works by well-intentioned volunteers on an estuary margin resulted in land disturbance of an unscheduled battle site without opportunity for Karakia and the correct Tikanga by descendants of the warriors.

For Māori, **cultural history and identity is embedded in nature,** in the land and water itself. So ER projects present great practical opportunities for Iwi/Hapu to:

1. exercise their obligation for Kaitiakitanga (which is usually translated as guardianship or sustainable management);

2. to reconnect linkages between people and the environment, and

3. to build Mātauranga Māori (or 'traditional knowledge' and engaging with the world) through improving cultural resources which maintain or enhance Ahi Kā (living presence, the burning fires of occupation).

Consideration of the Māori world view is essential to understanding the spiritual essence of Māori. We need to have an appreciation of the principles of Mātauranga Māori, Kaitiakitanga, and Mauri – or life-force. Dr Mills explains that *"Mauri is integral to… another concept, that of whakapapa – loosely translated as a "genealogy" – everything is related through whakapapa – humans are a part of nature"*.

Mauri is also linked with mana, and if the mauri of an ecosystem is unhealthy or degraded, so too is the mana of the people.

Providing for the cultural and spiritual connection that Māori have with the land is needed when developing ER projects in an inclusive way, and to give due effect to Te Tiriti o Waitangi.

Managers should seek to develop a **'partnership model'** with Tangata Whenua, this is a step up from seeing Iwi as another 'stakeholder'. We should acknowledge Māori as first peoples of a region, and recognise then provide for Iwi values right from the outset of a project, throughout the design and onto delivery.

The very essence of the Māori World View is relationships – **'whanaungatanga'**, or getting together – not only between people, but also between the spiritual world and the natural world. So an awareness and understanding of the Māori World View allows more meaningful and effective engagement with Tangata Whenua.

The concerns, values and **knowledge of Māori can form a valuable component** of the ER process. Managers should recognise the benefit of partnering with Iwi, including site-specific and specialised knowledge developed over generations, and passing on historical information and solutions for a thriving biodiversity.

Partnership with Iwi also provides a great forum for the community to learn about Te Ao Māori and **foster relationships** between Tangata Whenua and other groups. It's an opportunity to see tikanga in action, and for kōrero between cultures.

Pitfall: Restoration design + strategy coordination

The next issue we wanted to highlight was the design process of an ER project. Having a quality **project design and overarching ecological strategy** is so important to be effective in our efforts.

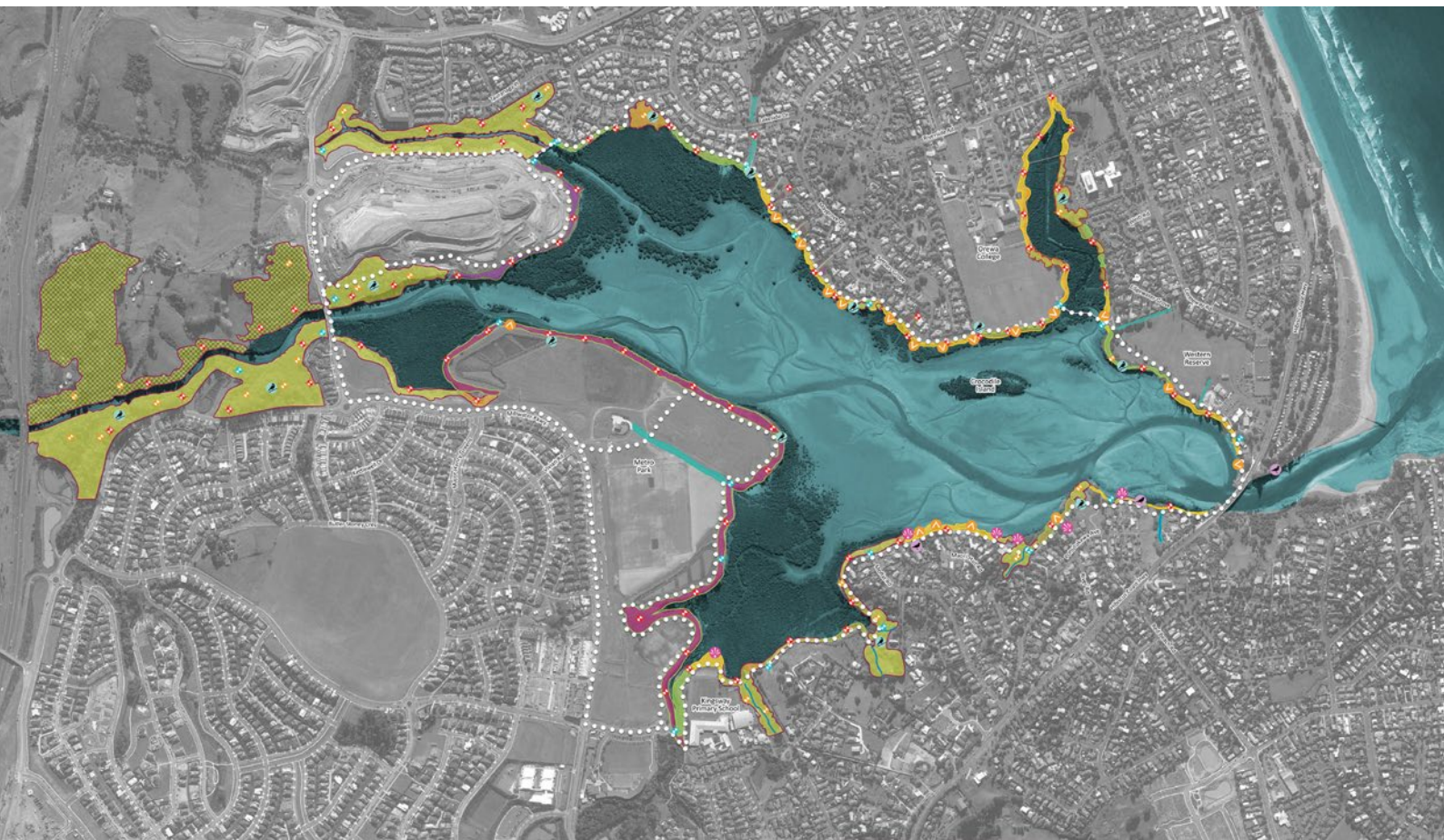
To put it briefly, a restoration design needs to be fit for purpose, tailored to the site, and work with the resources available. It can be tempting to bite off more than one can chew, or automatically assume that a strategy that worked somewhere else will be successful here too.

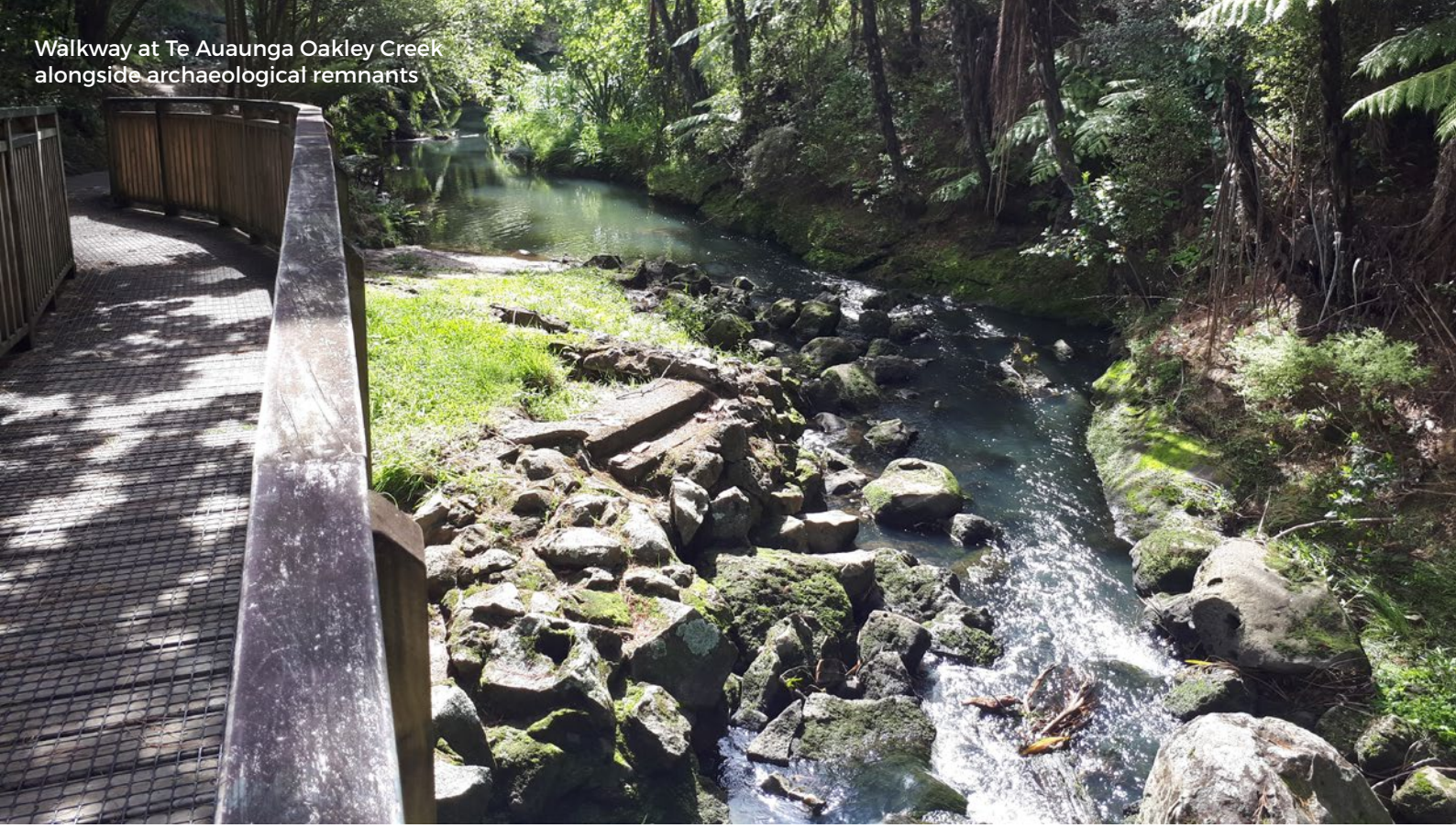
We suggest incorporating SMART goals in the Design, where SMART stands for Specific, Measurable, Achievable, Relevant & Time-related. An appropriate degree of planning and investigation is to be undertaken to fully appreciate the needs of the project and setting the right objectives.

Quite often other groups are active in the same space, so to avoid duplication of effort and to maximise effectiveness, it pays to join forces by integrating with existing programmes when you can.

Having a quality overarching design like this one at Orewa Estuary is invaluable for providing guidance and coordinating works of various stakeholders.

Orewa Estuary ER Plan – coordinating weed and pest control with revegetation efforts across all sites





Walkway at Te Auaunga Oakley Creek alongside archaeological remnants

CONSENTING STAGE

The next group of potential pitfalls comes at the Consenting Stage – when you're seeking planning permission.

Pitfall: The rule book

But you may well ask: *It's weeding and planting, why should I need a resource consent for that?*

Well, resource consenting can be a funny beast at times. The **scope of physical works may not align with the complexity of the statutory environment.** For example, you can have a 5-storey apartment block that ticks all the permitted activity boxes and build it up as of right, but there have been simple community BBQs that triggered just about every conceivable planning infringement known to man.

Whether you agree with the nuances of our statutory climate or not, it's a fact of life we have to deal with.

The thing is, ER projects are typically undertaken within areas of high natural values such as riparian yards, coastal fringes, heritage overlays or in Significant Ecological Areas. And these zones (quite rightly) have more stringent rules.

So when we're operating in these spaces, we need to have good grasp of the rule book – or books, as the case may be. We'd recommend doing your **RMA due diligence**, as this helps with early identification of issues and to ensure your thinking is aligned with the regulatory staff who sign off on the projects.

Pitfall: Archaeological landscape

What archaeology? The archaeological landscape is often not obvious. But ER projects are commonly centred around streams or the coast, which were considered ideal locations for settlement by Māori due to their natural resources and proximity to transport routes. Added to this can be a layer of early European settlement, found close to rivers and streams for much the same reasons.

It's not surprising then that we can disturb archaeological sites on the ground or just below the ground surface when carrying out weeding and planting activities.

Such is the case at Te Auaunga Oakley Creek, **where restoration efforts are interwoven with archaeological remains**. The area is unique within Auckland for its concentration of archaeological sites relating to early European settlement, in addition to abundant evidence of Māori occupation. Within this ER project we had to consider how to work around historic sites that included dams, midden, stone walls, and a place recorded as a 'lunatic asylum & pig farm'.

For this reason, the project required permits under both the RMA and the Heritage New Zealand Pouhere Taonga Act, with all the checks and balances that go with them.

Source: Auckland Council GeoMaps

Example of HAIL land – historic horticulture

Pitfall: HAIL

The potential for soil contamination is wide-spread, and is an important consideration given the nature of planting work – if you're not careful, you can end up with a lot more than just dirt on your hands.

HAIL is an acronym for Hazardous Activities and Industries List, and can include such things as horticulture, old landfills, sports fields, historic dumping, or contaminating industries. Many public open spaces have been subject to these activities.

But how do we know if soil is **potentially contaminated?** We can begin by carrying out a desktop study to see if the site is on the HAIL before starting works, which is pretty quick, and can give us clues as to whether further investigations and safety protocols are needed.

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This historic aerial photo shows a plot of land where there was once horticulture – the long rows of trees and crops are a dead giveaway – where regular pesticide or herbicide use would have been likely. Now it's a streamside suburban neighbourhood and esplanade reserve. Pesticide chemicals from horticulture can sit in the soil profile for a long time and are potentially dangerous if ingested.

Disturbance of HAIL land doesn't necessarily require resource consent, because for planting projects such a small quantity of earthwork is needed and it's usually spread over a wide area, but legally, you do need to demonstrate how you're providing for health and safety of workers, and managing potential adverse environmental effects.

If identified early enough, the impact of working in HAIL land need not be too onerous. A simple **Soil Handling Plan**, is usually sufficient for ER projects. It highlights important Health & Safety measures – mostly common sense stuff, like wearing gloves, be wary of sharps, and don't eat the dirt – but it also provides clear instructions in case unexpected contamination is encountered.

DELIVERY STAGE

On the face of it, ER projects seem uncomplicated – pull weeds out, maybe a bit of spraying and some tree felling, then replant. It's not rocket surgery. But belying the ease of physical works can **be layers of unseen or unexpected complexity.**

Photo credit:
B. Druskovich

Pre-1900 glass bottle examples.

Pitfall: Hidden or Buried Complications

Encountering Archaeology During Works

Following on from consideration of the known archaeological landscape at the Consenting Phase earlier, we need to be prepared for the possibility of hitting new archaeological sites during weeding and planting works.

And quite often it can be difficult to tell the difference between the artefacts of pre-1900 life and modern day trash. This was the case at Te Auaunga Oakley Creek again with glass and old iron items, and distinguishing natural stone scatterings from dilapidated dry stone walls.

So with the help of our project archaeologist, the team developed guidance sheets to help contractors and volunteers identify remains, as well as protocols to follow should new sites be encountered.

Regarding accidental discoveries, it's tempting to believe that the probability is low or "it won't happen to us". But it does happen. A Council project in east Auckland uncovered a burial site, which is pretty much as big as it gets. Several coffins were uncovered containing kōiwi of prominent Māori amongst other artefacts from all over the world buried together.

These encounters do happen. So be prepared. Research the records. And **have protocols in place.**

Kauri Dieback Disease

You would've heard in the media about the significant threat Kauri Dieback Disease is posing to our native forests. But what you may not have realised is that the pathogen has also been linked to pine trees making them 'carriers' of the disease. This is another example of an invisible challenge complicating our restoration efforts.

Midden found in the soil profile.

Photo credit: Friends of Oakley Creek

Pitfall: Encountering Contamination During Works

Sometimes it can be hard to tell the difference between deliberate function, trash, or something much more sinister, as illustrated by these photos. The top photo is of corrugated building sheets that *contain asbestos*, whereas the bottom photo is corrugated building sheets set up as *refuges for geckos*.

Speaking of sinister, **asbestos** is one of the hot topics in the NZ contaminated land world right now. Recent legislation called the Health & Safety at Work (Asbestos) Regulations has really lifted the game in terms of responsibility and protocols for asbestos management.

Volunteer planting at La Rosa Stream – managing health and safety

Under these Regulations, you have a PCBU, which stands for 'Person Conducting Business or Undertaking'. A PCBU has certain duties and liabilities when it comes to the way asbestos is dealt with. Whilst volunteer associations are not considered PCBU's, Councils and volunteer organisations are.

The waters can get muddied further when Councils are working alongside volunteers or "Friends of..." groups, or when a project crosses over public and private land boundaries. The Act was introduced in 2016, but on the 4th April this year, the leniency period expired from Work Safe NZ for compliance with regulations. Big fines can be dished out for breaching the rules, between $10,000 and $300,000 – which is more than enough to cripple a restoration project.

Pitfall: Health & Safety Requirements

The new Health & Safety at Work Act effectively defines volunteers as 'workers'. This has ramifications for ER project managers. For example:

- you need to have the *right supervisors* trained in the *right stuff*, such as having enough first aiders on site;
- you should have the *right PPE gear* for the job, which can be challenging for volunteer groups;
- you need to have someone assessing the capabilities of volunteers that turn up, and giving them the *right jobs*. It's not the best idea in the world to have 3yr olds near running water or 90yr olds on steep slopes. And you can't have people wearing jandals on the spades where they have the risk of chopping off a toe;
- you also need to make sure that only *accredited people* are applying herbicides or pesticides, and that volunteers are not standing downwind of spraying works.

All this means it can be quite tricky to **balance accessible community involvement with the legal requirements**. Obviously, you don't want to turn volunteers away, but you do need to clearly discuss the risks involved and have a substantial site induction backed up in writing. Balancing safety with nature, whilst keeping it fun and engaging, is a true art form.

For organisations that don't have the resources to develop their own Safety Management Systems, there are great tools out there to help, like the 'In Safe Hands' Toolkit and Workshops through Conservation Volunteers NZ, which:

- gives an overview of the legislation
- provides training on safety policy and procedures
- gives guidance with running volunteer inductions

MAINTENANCE STAGE

The final grouping of potential pitfalls we're discussing are those that emerge during the Maintenance Stage of a restoration project. This is the ongoing care for plants and habitats following the initial burst of planting and weeding activity at a site.

Pitfall: Lack of Long-Term Planning

Long-Term Strategies – so what's the plan past the standard 2-3 year defects liability period? Hope for the best? Are actions based on reactions to complaints, or requests from the community? Or do you have the systems and processes in place to look after the ER investment until such time as ecology gets to the stage of maturity that it is pretty much self-sustaining?

Having a **Long-Term Plan that includes plant maintenance** is so important to restoration success. Otherwise all the sweat and tears from weed clearance and planting days can be in vain.

Long-Term Planning harks back to the Project Design stage, having the right goals, and making sure sufficient funding is set aside for ongoing maintenance.

Paying for this can be tricky. We live in a real world of budgets and financial constraints. It would be great if there was a huge pool of money to invest in Opex, but the reality is that cash is limited, so there needs to be some sort of compromise. But how do we prioritise restoration efforts? How do we get the best bang for buck?

Pitfall: Not Measuring Effectiveness

We'd suggest that **investment in monitoring and measurement of results** would go a long way in building up this knowledge for a region. Having a good set of baseline data is ideal too.

It would be great to have strategies tailored to individual ER sites, but maintenance approaches are more likely to be generalised. Don't get us wrong, following generic best practice is certainly valuable, but how do you really know how effective you are being? Are we restoring ecosystems or just landscaping?

Using natural indicators, such as bird counts, and photo monitoring are just two ways to measure effectiveness of an ER project over time. These would ideally be deposited in a central data base, so they can be used to inform value for money spending.

There are a number of really useful tools out there to help with recording this data, like the Naturewatch app, which you can download for free.

Pitfall: Disempowering Communities

As mentioned earlier, effective Community engagement is such an important cog in the ER project machine. Managers should look to **enable communities rather than just directing them**. This may require a certain degree of 'letting go of the project reins'.

Councils are often in a great position to play a facilitator's role in enabling Community Groups to contribute. This can be through provision of information, expert advice, tools or simply by picking up some of the tab.

But there can be frustration for those groups not used to dealing with Council organisations. Common complaints include that 'the system' disempowers communities, that it works for the Council organisational structure, but not so much for 'Friends Of' volunteers. Rightly or wrongly, there's accusations of being overly bureaucratic or having too many hoops to jump through before the 'real work's done'.

The effectiveness of the Council – Volunteer partnership can become dependent on relationships between individuals formed over time. This creates a project risk, because eventually people do move on. Often there is a champion from the community driving a project and organising all the volunteers. So having a **succession plan**, another leader ready in waiting, becomes important when the time comes for that champion to leave.

Same goes for Council – lines of communication can break down and effectiveness of partnerships can be diluted when there's a change in personnel. Therefore, it's really helpful to have clearly **documented processes** that is easily picked up by new staff so that continuity and understanding is not lost. Also, be sure to keep community groups informed when there are changes at Council.

Often volunteers are working in tandem with Council contractors – so it's **important to have great relationships** and be aware of each other's activities to avoid grievance, especially considering the time and energy invested. There can be blurred lines between the roles of contractors (which can frequently change) and the volunteer groups.

If it becomes 'all too difficult' community groups may not be prepared to get involved.

CONCLUDING THOUGHTS

There's no doubt that Urban ER projects have fantastic potential for benefiting the environment and the communities living around them. But at every turn there are hurdles that create a source of huge frustration for the unprepared. So to minimise the headaches: do the due diligence; invest in a strategic plan; and be ready for the unexpected.

Hopefully this discussion has been helpful, and you can take away a few ideas for avoiding or managing common pitfalls that can crop up at each phase of the ER journey.

Keep up the good work!

Photo credit: Auckland Council

Want to know more? If you'd like help with developing or consenting your urban restoration project contact the team at 4sight Consulting, we'd be happy to chat.

Simon Karl

Senior Planning and Policy Consultant

4Sight Consulting Ltd

simonk@4sight.co.nz

027 439 6360

Tony Payne

Senior Ecology Consultant

4Sight Consulting Ltd

tonyp@4sight.co.nz

027 807 9018

References

1. Stella, J.C., Rodríguez-Gonzalez, P.M., Dufour, S., Bendix, J., (2013). *Riparian vegetation research in Mediterranean-climate regions: common patterns, ecological processes, and considerations for management.* Hydrobiologia. 719, pp291-315
2. Mills, M (2003). *Restoring the Mauri of Oruarangi Creek.* Water Science and Technology Vol 48 No 7 pp129-137
3. Auckland Unitary Plan (Operative in Part) (Updated 29 June 2018), Chapter D21 - Sites and Places of Significance to Mana Whenua Overlay. Pg 1.
4. Craig, J.L. and Stewart, A.M. (1994). *Conservation: a starfish without a central disk.* Pac. Cons. Bio., 1, 163–168.