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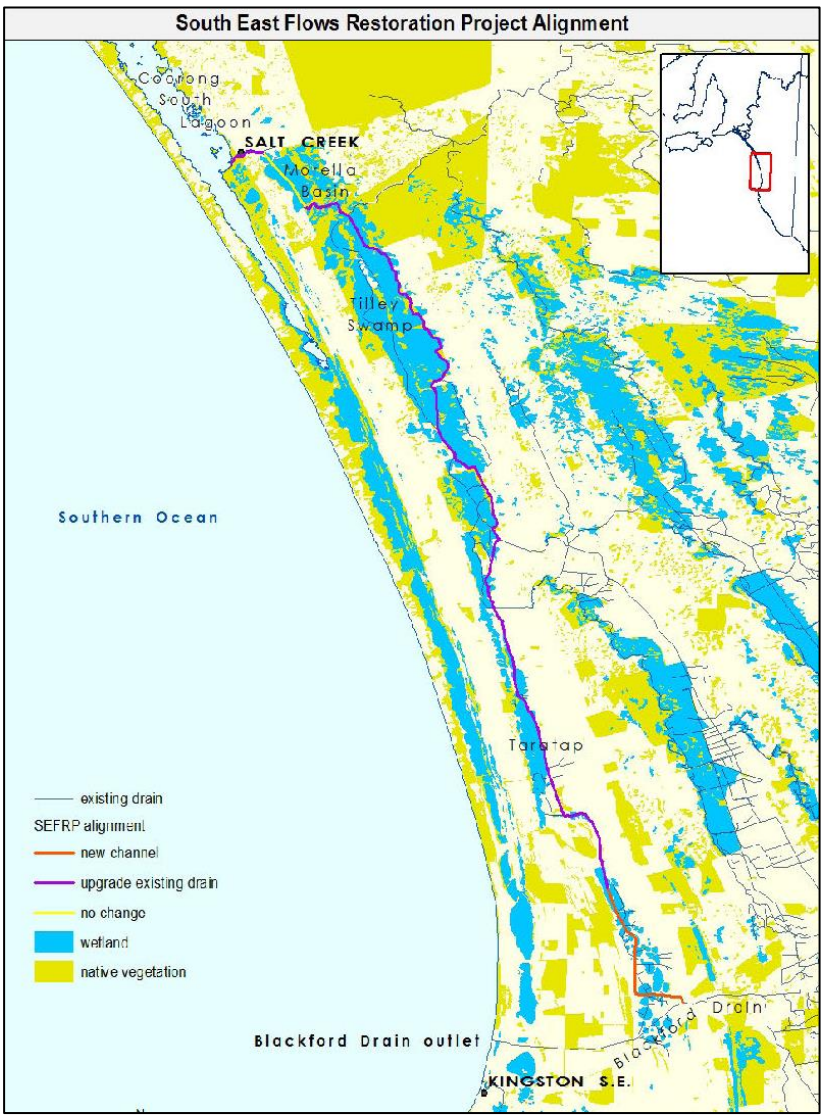
DISCUSSION PAPER – December 2014:
Ensuring adequate provision of water for Upper South East Wetlands as part of the South East Flows Restoration Project

EXECUTIVE SUMMARY

The South East Flows Restoration Project provides a welcome opportunity to deliver benefit for wetlands of the Upper South East and Coorong. This concept has the potential to restore flows from the lower and mid South East along historical flow paths, with the possibility of enhancing wetlands in the region that have been impacted by 150 years of past drainage works. Studies investigating project feasibility identified Tilley Swamp as a key environmental asset that would benefit by being included on the alignment for strategic works.

With the project now funded by State and Federal Governments, this paper aims to bring a series of detailed points of discussion into focus, regarding the method by which flows might be conveyed. We hope to clarify if the concept and works will achieve the stated project objectives to the greatest extent possible, capable of delivering the widest environmental benefit and management flexibility.



Given the limited information shared publicly to date, we are seeking clarification as to whether the project, in delivering flows to the Coorong, will:

(a) restore overland flows using the final 35 km stretch of the Tilley Swamp watercourse?
or
(b) result in a major, widened drain effectively bypassing Tilley Swamp?

With the existing Taratap and Tilley Swamp drain alignments identified for upgrade through the project (see map on Page 1 from the information session flyer), Nature Glenelg Trust is seeking an open discussion between project managers and the community, to ensure this overarching question is satisfactorily resolved before commencing the detailed design process.

Specific related questions that require addressing are as follows:

PROJECT SCOPE:

1. The Tilley Swamp alignment was chosen as the best route for the project, partially on the basis of the potential to restore flows to the watercourse and enhance its environmental values. With this in mind:
    a. will Tilley Swamp be capable of receiving sufficient, sustained longitudinal flows to create an inundation regime required to improve its condition, with the agreement of all relevant parties?
    b. will the project meet its stated objective of enhancing flows to Upper South East wetlands and if so, which wetlands specifically will receive additional flows?
    c. would any additional wetlands, that do not currently receive flows from existing infrastructure, benefit from the project?
    d. have the proposed channel dimensions or its alignment been altered (or could they be through landholder negotiation) to provide improved drainage service (which was never the intention of the project) or more rapid movement of water to the Coorong?
        i. If so, how would such a proposal be consistent with the project objective of restoring flows to Upper South East wetlands, which fundamentally relies on the ability to retain more water in this part of the landscape?

FLOW VOLUME, TIMING AND FREQUENCY:

2. Under the current proposed scope:
    a. how often is it predicted that water would be allowed to flow past the main diversion point and out to sea (down the Blackford drain), due to the limited storage capacity of Morella Basin and Tilley Swamp, and the need to maintain the Coorong within its target salinity range?
    b. is it acknowledged that, unless the current limited storage capacity of Morella Basin and Tilley Swamp is addressed, the ability to provide freshening flows for the Coorong over the critical summer period will be impacted?
    c. noting that Morella Basin fills to its (currently limited) maximum storage capacity most years, and the Coorong has temporarily dropped below its minimum target threshold during each of the past three winters in the absence of additional South East flows, would any water have been diverted from Blackford drain during the past three years?
    d. how long will flows be held in Morella Basin, and will this be sufficient for natural processes to remove excess nutrients from the water?

NATIVE VEGETATION CLEARANCE:

3. What magnitude of native vegetation clearance is proposed for the project and how will this be offset?
4. Has any consideration been given for an environmental offset (ideally wetland restoration work) to occur elsewhere in the region, presumably of greater size than the area of native vegetation clearance associated with the current proposal?

LAND TENURE AND COST:

5. Has the option of providing compensation or stewardship incentives to landholders to re-inundate (expanding the storage capacity of) the Tilley Swamp watercourse, along with other associated costs, been assessed as an alternative to widening the last 35 km of the existing groundwater drain?

BROAD WETLAND MANAGEMENT ISSUES:

6. As well as accommodating more management flexibility at Morella Basin by increasing the storage capacity of Tilley Swamp (point 5 above), would it not also be prudent to increase management flexibility in other parts of the catchment now also linked to Morella Basin and hence the Coorong – such as the northern Bakers Range Watercourse?

DETAILED DISCUSSION PAPER

Background

Nature Glenelg Trust (NGT) is a not-for-profit, regionally based non-government organisation working in South Australia and Victoria, and has a particular emphasis on wetland restoration and management. As well as identifying and delivering projects that meet our organisational purpose across all land tenures, we are particularly proud of our success in helping broker and implement community-led solutions that work across the boundaries between public and private land, bringing together a wide range of people with an interest in wetlands. Examples of the success of this approach include wetland restoration trials now underway in western Victoria; in Discovery Bay Coastal Park and on public and private land straddling the boundary of the Grampians National Park.

Given our organisational focus on wetland management, the recent announcement of funding for the South East Flows Restoration Project – to restore flows from artificial drainage catchments in the South East, by diverting flows northwards to the south lagoon of the Coorong – is of significant interest. However, the information that has been made available to date indicates that the proposed design may overlook one of the primary goals promoted in early concept planning i.e. concurrently maximising environmental outcomes for wetlands in the Upper South East at the same time as delivering flows to the Coorong. Our organisation believes the topic of environmental benefits requires ongoing consideration and community discussion before the design of the project is finalised and implemented; hence this discussion paper is being circulated across government and the wider community to help ensure that an informed conversation between all parties takes place.

Introducing Tilley Swamp

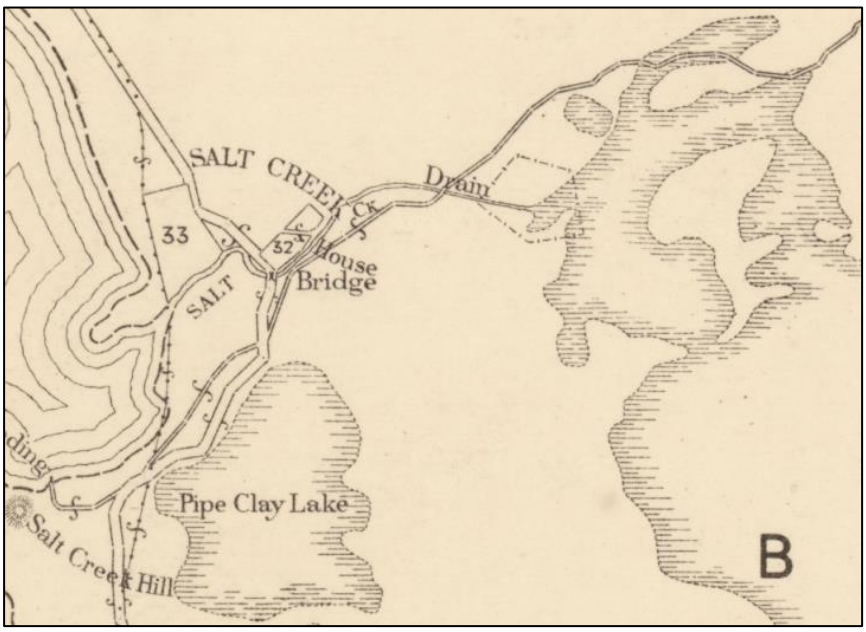
Named after William Tilley, who held a pastoral lease over the swamp from 1851-59, Tilley Swamp was originally a series of semi-permanent, interconnected lagoons, the last of which (Morella Basin) had to fill to a significant depth (almost 3 metres deep) in order to generate occasional natural overland flows into the Coorong via Salt Creek. On the 8th of January 1863, while travelling south towards Mt Gambier, William Milne (Commissioner of Public Works) said "*we went up the Salt Creek a short distance and, turning up a rise on the right, had a fine view of Tilleys Swamp, which had the appearance of a long lake. We discussed the practicability of draining it by cutting a trench through two saddles of low hills onto the Salt Creek.*"

Other early observations in this area, also recorded during January 1863, by Hanson (Chief Engineer) and Coulthard (Assistant Engineer) appeared in an article in the Border Watch on the 10th of July 1863, entitled "The Drainage Question". Hanson stated:

> "*The Salt Creek and Tilley Swamp being then the outlet of the water over so large an extent of country, it became necessary to examine, the ground at this place, and see whether there was anything which prevented the exit of the water, and whether, if so, the outfall could be improved. At the time of examination, although there was a considerable amount of water in the lower or north end of the swamp, there was no communication between the swamp and the creek, otherwise than that which might arise from soakage, to which a small current in the creek appeared to be due; but in times of flood there appeared to be two channels by which the overflow gets into Salt Creek* [see second image over page]. *Two small rises exist, one in each of these channels, by which the water is pounded in the Swamp until it gets (it is said) to be nine feet deep. When this is the case tidewater flows over the rise, and a stream, or rather two streams run into the Salt Creek. From this it would, appear that a short cutting of about nine feet, deep would lower the water in winter time on Tilley's Swamp by about nine feet, and entirely drain the upper part of the swamp at all times.*
>
> *This is a statement made from judging by the eye only. It is however now being tested by the level, so that the feasibility and cost of the scheme may be known.*"

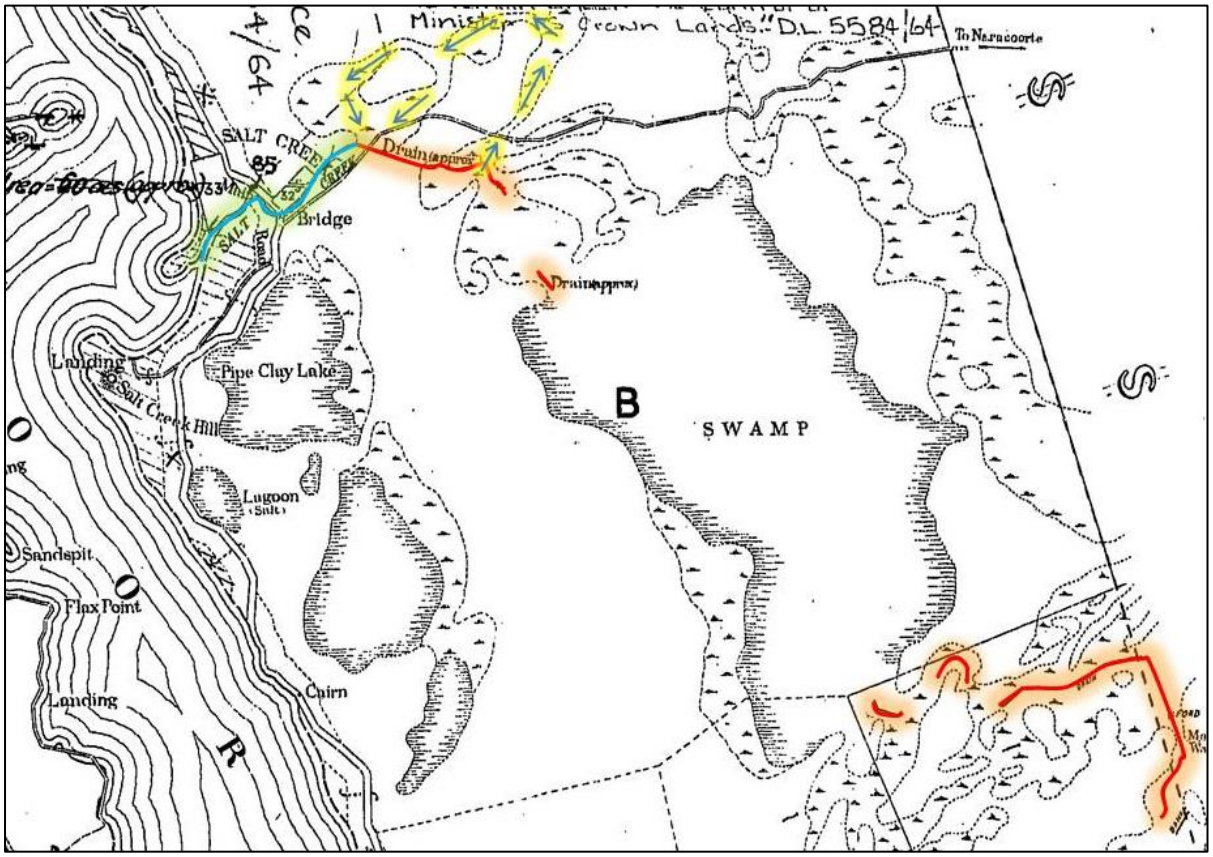
Levels were later taken and the first drain, from Morella Basin into Salt Creek, was dug in 1864 – as shown in the map (over the page) from 1896.

Tilley Swamp remained the ongoing subject of early drainage discussions for decades to come, as it is situated en route to Salt Creek, which was considered a natural terminus for a significant proportion of the unwanted surface water inundating large tracts of the mid and upper South East at that time.



***RIGHT:* Map from 1896, showing first artificial cutting between Tilley Swamp (Morella Basin - right) and the Coorong (left) via Salt Creek.**

Early regional surface drainage works that followed encouraged more efficient flow towards and through Tilley Swamp and into Salt Creek, as shown by the additional cuttings visible in the 1943 map below.



Map from 1943 showing the natural section of Salt Creek (blue line), original flowpath (blue arrows) and artificial drainage (red lines) into and out of Tilley Swamp (Morella Basin).

Later, ocean outfalls for drains in the south (e.g. Drain M, Drain L, Blackford Drain) then began to progressively, but substantially, reduce the quantity of water that arrived in the Tilley Swamp watercourse – eventually starving Morella Basin of all regular overland flows. Additionally, more recent channelisation of flows from upstream drainage discharges (including deep drainage itself since the late 1990s) has exacerbated a shift in character that was already well underway.

As the landscape has dried out, the watercourse has undergone a process of "terrestrialisation", where floodplain species intolerant of long periods of inundation (such as Swamp Paperbark) have expanded across the watercourse, displacing other wetland vegetation (or open space) that had persisted as a reminder of wetter times past. In recent years, drainage is now observed to be so comprehensive that dryland (coastal dune) species have begun to invade the dry bed of what was once Tilley Swamp.

A former wetland basin in Tilley Swamp being invaded by Swamp Paperbark (*Melaleuca halmaturorum*) as a result of reduced inundation

***LEFT* - Coastal Wattle (*Acacia longifolia* ssp. *sophorae*) and *RIGHT* - Coastal Bearded Heath (*Leucopogon parviflorus*); both dryland species, now establishing in the watercourse alongside floodplain species, like the surrounding Swamp Paperbarks in both images**

The recent exception to this trend, at the terminal end of Tilley Swamp, is Morella Basin; a portion of which was strategically purchased as part of the Upper South East Program (USEP) in 1998 and later incorporated into Martin Washpool Conservation Park (in 2005). The basin, used to hold saline groundwater drainage discharge emanating from the Upper South East network, has a new suite of evolving ecological values consistent with a more shallow and saline character than its pre-European state – but important wetland values nonetheless. Notably, Morella Basin now enables flows to be regulated into the Coorong via Salt Creek; if and when it is deemed desirable to do so. This site is a prominent exception to the drying trend not only observed throughout the rest of Tilley Swamp, but also witnessed across most of the Upper South East; since comprehensive groundwater drainage led to the construction of approximately 650 km of deep drains throughout low lying parts of the landscape from the late 1990s until 2010. This network has substantially altered inundation patterns across the majority of the Upper South East and, in conjunction with an extended period of below average rainfall, coincides with a significant decline in the character and condition of a large number of wetlands in the affected area.

RIGHT:

Aerial image of the Coorong South Lagoon and ephemeral lakes (left side of image) and original extent of Tilley Swamp (wetlands layer in light blue), from Morella Basin in the north, to Henry Creek Rd in the south.

Time to question the logic of flows bypassing Tilley Swamp

The USEP invested significant resources over several years into the concept of restoring flows to Tilley Swamp, primarily to provide additional storage capacity over and above that available in Morella Basin during periods of high inflow, but also for the environmental benefit associated with restoring water to this once immense wetland complex. However, unlike Morella Basin, negotiations for the concept have never successfully concluded with all the relevant parties; meaning that true, unimpeded watercourse (overland) flows are yet to occur over the 35 km section of the Tilley Swamp watercourse north of Petherick Road. However, at the same time, the management of levels in Morella Basin and the limited capacity of the existing groundwater drain are causing some drain-related backwater inundation impacts in parts of the former Tilley Swamp floodplain – a source of ongoing tension between the relevant parties.

Given the broadly acknowledged decline in the wetland values of Tilley Swamp, it would appear that there is currently an opportunity to realise a stated objective of the South East Flows Restoration project "*to enhance flows to wetlands in the Upper South East*", by specifically restoring a more natural inundation regime to this watercourse. The significant role Tilley Swamp could play in helping to manage and store substantial volumes of water likely to be generated during peak flows, also provides important flexibility for the management of the drainage system; in turn also directly benefitting the Coorong.

It is worth clarifying that the term "watercourse" is being used here to describe the entire Tilley Swamp flat, incorporating the floodplain either side of the existing groundwater drain. This is an important distinction, because satisfactorily inundating the watercourse (and deeper individual wetland basins within it) would require retention levels to be set for Morella Basin that cause the existing groundwater drain to "break its banks" for periods of time.

The available public information about the engineering design of the proposed alignment provides insufficient detail to assess how many wetlands will benefit and to what extent, but it is clear that a rare opportunity currently exists for the project to improve wetlands of the Upper South East while also providing water to the Coorong.

Conversely, it appears possible that a perceived need to maximise the efficiency of water transfer to the Coorong has shifted the focus of the project towards a design fixed on conveying entirely channelised flows for the whole alignment length i.e. from Blackford Drain to Salt Creek. Such a shift would compromise wetlands en route (such as Tilley Swamp) and introduce a range of concurrent potential threats to the South Lagoon of the Coorong, related to diverted water quality, Morella Basin storage capacity, and the potential volume and timing of releases via Salt Creek, as explained in more detail later in this paper.

If this were to happen, the project runs the risk of becoming a program focused almost entirely on drainage engineering, and a rare watercourse restoration opportunity, unlikely to be repeated (to address a century-long trend of environmental decline in one of the South Australia's most significant aquatic habitat regions) would be lost.

What would this scenario mean for Upper South East wetlands that are meant to benefit from this project?

Under a scenario where a single, deep, wide drainage channel is constructed along the entire route:

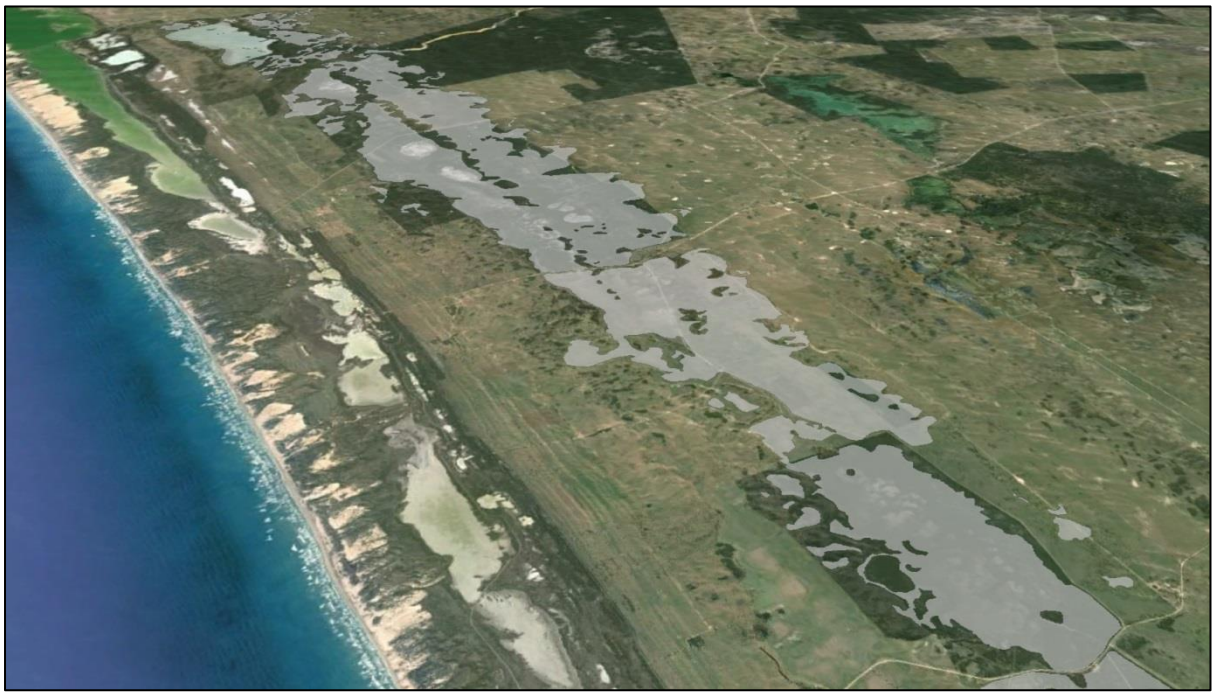
- Wetlands of the Taratap flats are likely to continue to be capable of receiving diversions of suitable quality water under similar arrangements to the present management regime. These diversions are likely to be moderate in volume due to the shallow nature (limited storage capacity) of these wetlands and the need to maintain adequate cross-flat drainage service for agricultural land on the eastern side of this flat.
- Wetlands of Tilley Swamp, from Petherick Road to Salt Creek, are likely to be disadvantaged by:
    a. **channelised flows completely bypassing the watercourse**, with only limited capacity, if any, for diversions into disconnected portions of the watercourse as a result of current management arrangements that prevent longitudinal watercourse flows;
    b. **the widened channel also operating as a groundwater drain** that, outside of flow diversion periods, is likely to exacerbate the shift in vegetation (terrestrialisation) of the watercourse by increasing potential dewatering impacts now known to be caused by deep drainage;
    c. **a lack of agreement to inundate** parts of the watercourse that have been developed for agriculture. Unless resolved, this issue will seriously limit the capability to ever use the proposed drainage channel to sufficiently inundate formal conservation areas within Tilley Swamp, or to hold water in Morella Basin to greater depths, when desirable to do so.

As a result of the geographic scope of the project and alignment of the proposed drain, it now seems unlikely that the benefits for Upper South East wetlands that were promised as part of this project will materialise; unless some critical modifications are made to project design that bring it back into line with its original objectives.

Oblique image of the watercourse from Tilley Swamp Conservation Park at Petherick Road (bottom right) to Morella Basin (top left), showing the route of the existing narrow groundwater drain (red) that would be substantially widened, should the proposal involve entirely channelising flows

An alternative proposal to meet the stated objectives of the project for Upper South East wetlands and the Coorong

What if the last 35 km of the widened drainage channel proposed under the project were not constructed through Tilley Swamp, but all flows conveyed instead using a combination of the Tilley Swamp watercourse (for moderate-large flows only) and the existing groundwater drain (during all flows, but capable of containing low flows)? Under this scenario, assuming a successful negotiation with the relevant land owners, the whole Tilley Swamp floodplain from Petherick Road to Morella Basin could be restored.



The potential restoration project (shaded) from Tilley Swamp Conservation Park at Petherick Road (bottom right) to Morella Basin (top left) – with sufficient inflows, this could be considered for reinstatement as a restored watercourse, providing additional capacity for releases into the Coorong.

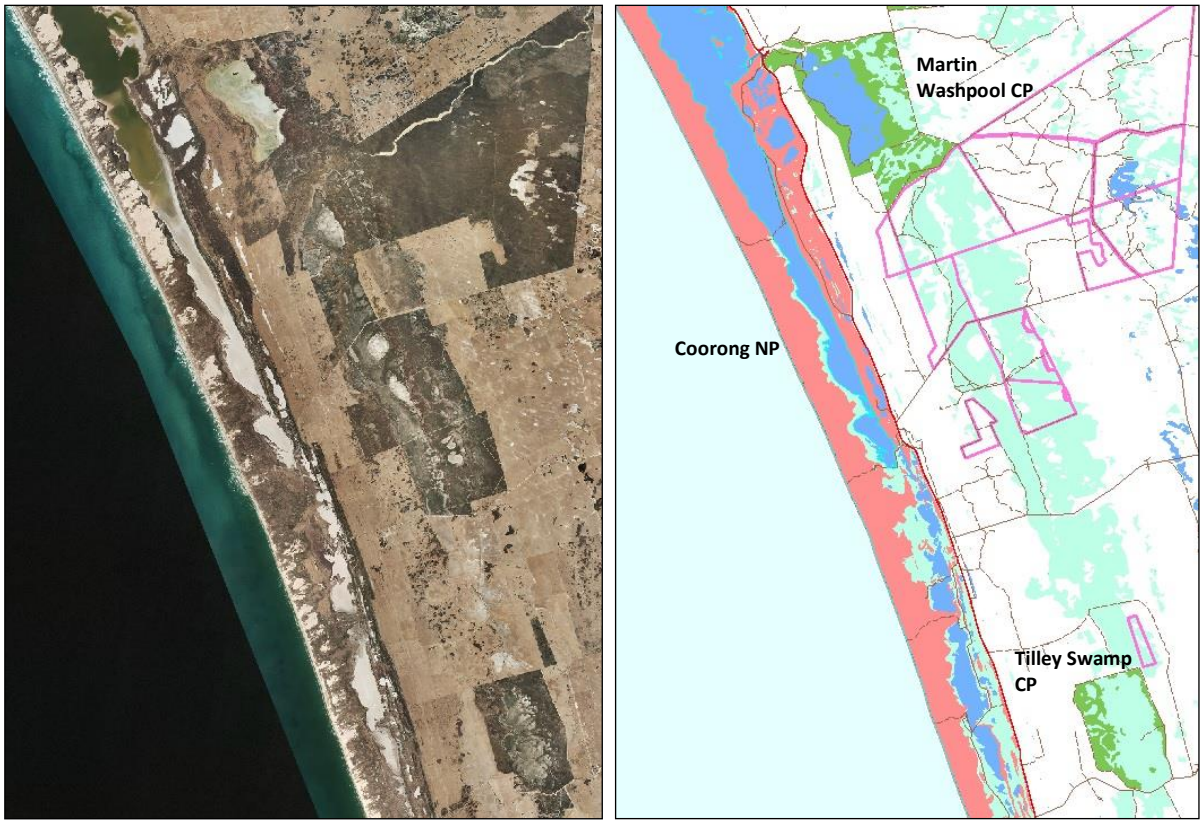
Discussion points

A series of points worth considering in relation to this concept are addressed here:

Issue	Current likely proposal (use a widened drain for the whole alignment)	Alternative proposal (use widened drain until Petherick Road, then the watercourse for the last 35 km)
1: Capacity to convey or store the required volume of water	Estimates of flow volumes are destined to appear more reliable and efficient when calculated based on a channel design, constructed to specified dimensions. However, past experience in the Upper South East demonstrates the difficulty in meeting the environmental water requirements of wetlands in a highly engineered landscape with complex management infrastructure – particularly where those wetlands actually incorporate the floodplain immediately surrounding the drain alignment itself. Having mixed [agricultural (dry)/environmental (wet)] objectives in such a flat landscape runs the risk of significantly compromising outcomes for both. Unless agreements are reached with key landholders, the capacity to restore Tilley Swamp or store water for later release into Morella Basin will continue to be limited under this scenario, meaning that inundation of the true extent of Tilley Swamp is likely to be largely or entirely bypassed under current plans. It is currently unclear how much water will be committed to wetlands along the alignment or, more importantly, what their inundation regime (depth and duration) is proposed to be.	The best way to improve the environmental condition and wetland values of Tilley Swamp is to use the watercourse for conveying and/or holding the bulk of flows to the Coorong, accepting that under a range of conditions this may not be as "efficient" as a single channel. By using the watercourse as an extended flow equalisation basin, water could be accumulated for gradual release (also using the existing, lower-capacity groundwater drain north of Petherick Road) into Morella and the Coorong when it is usually needed most – over the summer months. Under this scenario, the entire Tilley Swamp flat would need to be managed and restored as a wetland with the agreement of key landholders. Such an agreement would permit more flexible management of the regulator at Morella Basin, and restoration of substantial wetland areas in Tilley Swamp, without encountering the current concerns regarding inundation on the Tilley Swamp flats. Under this scenario some water that is diverted into Tilley Swamp, although of high importance to the watercourse itself, would not necessarily be available for diversion to the Coorong due to the topography of the watercourse. The impact of this effect will vary from your to year depending on inflows and any carryover storage/inundation impacts from the previous year.
2: Water quality	**Nitrogen:** Publicly available water quality data (EPA website) indicates that Blackford drain water can have elevated nitrogen levels which, under a "single drain" scenario, may not have an opportunity to be effectively "treated" before release into the Coorong. **Salinity:** Salinity levels are likely to be consistent with those acceptable for release into the Coorong, to meet the objectives of the project. **Retention times:** With higher inflow rates to Morella Basin (a site that already fills to its current agreed capacity in most years), the retention time	Under this scenario, the majority of peak flows would enter the Tilley Swamp Watercourse at Petherick Road, where they would fill, spill and inundate a significant area of floodplain habitat on the way to Morella Basin. This provides an excellent opportunity for regular wetland processes to help "filter out" elevated nitrogen levels. Salinity levels are likely to vary considerably depending on wider catchment conditions; hence, it would be accepted under this proposal that Tilley Swamp would not be guaranteed to receive water below a set, agreed salinity threshold (as has been standard practice for many wetlands in the Upper South East). Having said that, peaks in saline flows are likely to be restricted to

	for water in Morella will need to be reduced. Thus, the ability to use the basin to improve water quality will be compromised under the existing proposal (which doesn't appear to provide for increasing the depth of Morella), with increased risk to Coorong health (eutrophication).	periods of lower flow, which increases the likelihood that such flows will be able to be confined to the existing, lower capacity, drainage channel. Overall, allowing a new ecology to form in Tilley Swamp around a restored, variable hydrological regime is preferable to the alternative situation where the watercourse is no longer able to effectively function as a wetland habitat at all (the current scenario for large areas of the watercourse).
3: Diversion rules	Under this scenario, it is foreseeable that future, otherwise divertible, flows in Blackford Drain may have to be allowed to drain to the sea. It is envisaged that this would typically occur when the Coorong is already within its target salinity range and levels in Morella Basin are compromising upstream drainage capacity in the Tilley Swamp channel. In this situation, the infrastructure proposed would be ineffectual in delivering the widest range of potential benefits to wetlands en route, an objective widely promoted during the initial planning and concept development phase of the project. It is worth noting that for the last three years salinity levels in the southern Coorong have dipped below the target minimum each winter. Hence if the project was in place, without providing any additional storage capacity in Morella Basin or Tilley Swamp to enable delayed releases of higher volumes over the summer, most Blackford water would likely have been left to flow out to the sea – noting that this was a period when the environmental water requirements of conservation areas within the Tilley Swamp watercourse were not met.	In contrast to periods when the proposed infrastructure is redundant, the alternative proposal would see maximum justification of the flow restoration infrastructure when the Coorong itself does not require flows. Under this scenario, water can be used entirely for environmental outcomes in Morella Basin, Tilley Swamp and other upstream wetlands en route. During times when the winter/spring salinity threshold in the southern lagoon prevents a rapid release, this option would enable flows to be held and released more slowly. This would prevent the Coorong Southern Lagoon dipping below the target minimum salinity level, but increase management options available to prevent it exceeding the target maximum. This option is only possible if inundation of Tilley Swamp watercourse is incorporated into project design, which would permit a higher retention level to be set and managed in Morella Basin. This option aligns with the recommendations of modelling that suggested releases from Morella during the mid to late summer are most effective at preventing salinity in the Coorong South Lagoon spiking above the target maximum (100 g/L).
4: Native vegetation clearance	Under this scenario, a significant total area of native vegetation will need to be cleared to make way for the footprint of a widened drain (of considerable dimensions), noting that the majority of vegetation clearance (including that in National Parks Reserves and Heritage Agreements) would be associated with Tilley Swamp north of Petherick Road. This area is recognised as a key biodiversity area in the South East Biodiverity Plan (Croft *et al* 1999). Given the scale of disturbance necessary, a substantial offset (environmental outcome elsewhere in the region for wetland habitat) would be expected by the community. A	Under this scenario, very little clearance would be required in the most heavily vegetated stretch of watercourse north of Petherick Road. However, clearance south of Petherick Road should also be offset with strategic wetland restoration works elsewhere in the region.

	precedent for such matters has been set with the Department of Transport investing in a strategic *South East Woodland Restoration Program* across the South East NRM region, to offset vegetation clearance associated with the recent Dukes Highway safety upgrade.	
5: Land tenure	Presumably, negotiations would be centred solely on the matter of securing the alignment "footprint" required for construction of an enlarged drainage channel. However, cleared land occupies some of the lowest-lying areas of Tilley Swamp that are already being impacted by inundation under existing, lower flow, conditions. Hence, unless wider issues of inundation across different land tenures in Tilley Swamp are resolved, a wider channel still runs the risk of seepage and local runoff causing peripheral inundation impacts without landholder agreement. This issue will continue to compromise the potential storage capacity of Morella Basin (for the benefit of holding water to best time inflows into the Coorong) and appears likely to provide ongoing operational problems for South Eastern Water Conservation and Drainage Board staff.	Negotiations to reinstate watercourse flows through private land situated between Tilley Swamp Conservation Park and Martins Washpool Conservation Park would need to occur under this option. However, the images below indicate the level of remnant vegetation present and the existing conservation status of much of the watercourse. Tilley Swamp is a rare example of where a comparatively small area of agricultural land would be impacted in order to restore a significant area of wetland habitat within a natural watercourse in the South East region. Given the private land involved and ongoing, unresolved inundation issues associated with the existing drain, sensitively negotiating this element of the alternative proposal is critical to its potential success.



LEFT: Aerial image showing remnant native vegetation; RIGHT: Land tenure image (from Nature Maps website) showing Parks Reserves (pink and green), Heritage Agreements (purple outline), and the Tilley Swamp watercourse (light blue).

6: Cost	The major expenditure item will be the range of costs associated with drain construction. So far, it is unclear as to whether any provision has been made to address some of the broader wetland management issues raised in this discussion paper.	With sensible planning, the aim should be to achieve an identical overall budget. The substantial savings made by not clearing, digging and widening the last 35 km of drain north of Petherick Road would free up funding required to address issues such as: - funds to provide as compensation or incentives to bring all of Tilley Swamp north of Petherick Road under conservation agreements that provide for regular watercourse inundation and revegetation; - upgrading Cantara Rd and other infrastructure necessary to accommodate re-instated watercourse flows; - parallel work to upgrade the northern Bakers Range watercourse, providing additional water to Upper South East wetlands en route to the Coorong (a concept strongly advocated by Wetlands and Wildlife, an organisation that also owns land in the Tilley Swamp Watercourse whose agreement will be required).
7: Broad wetland management issues in the Upper South East	Under this scenario, with the exception of a handful of existing diversions points, the project would be primarily about widening and upgrading the existing groundwater drain (to enhance its current limited capacity). Such works would create a major arterial drainage channel capable of conveying flows directly to the Coorong, largely bypassing wetlands along the way. When Morella Basin reaches its current (conservative) capacity and the Coorong South Lagoon is near its salinity threshold target, there is a strong likelihood that otherwise divertible flows will be left to bypass the diversion point, continuing to discharge to the ocean from Blackford Drain. Key locations where this risk can be spread, enhancing wider wetland benefits, include Tilley Swamp (the main subject of this discussion paper) and wetlands of the northern Bakers Range watercourse (associated with another diversion point requiring upgrade).	With the potential savings identified under Point 6, the project would not only have the capacity to substantially enhance the wetland habitats of Tilley Swamp each and every time a significant flow is delivered to the Coorong via the watercourse, but other outstanding issues that require careful consideration could also be addressed. For example, upgrading the northern Bakers Range watercourse to enable flows to be conveyed to other high priority wetlands en route to the Coorong, via this alternative existing route, is an obvious action that would ideally be brought into the scope of the project. Pursuing this proposal is likely to significantly enhance the likelihood of a successful negotiation to restore flows down the Tilley Swamp watercourse, given the shared interests of key landholders in both watercourses.

Summary

Nature Glenelg Trust is interested in being part of a discussion that gives people in the community, with an interest in wetlands and biodiversity, a more active role in determining the finalised design of the South East Flows Restoration Project; to ensure the project can most effectively meet its stated environmental objectives for wetlands in the Upper South East and the Coorong. We are seeking a discussion that is strategic, open-minded, informed by science, focussed on getting the best result on-ground for the widest range of wetlands, and where the issues raised can be resolved in a considered and logical way. We believe this request is consistent with the change in emphasis for how the Premier has said the South Australian Government now does business, namely; "*debate and decide*" rather than "*announce and defend*".

Our aim in producing this discussion paper is to ensure that the significant improvement of wetlands of the Upper South East (an objective of this project) remains a core consideration, while at the same time maintaining the capacity and flexibility to deliver high quality water to the Coorong when it is needed most.

If you would like to share your thoughts with us on this issue during the current phase of community consultation, please contact Nature Glenelg Trust on info@natureglenelg.org.au – we would appreciate hearing from you. Now is the time for the community to have a say.

About the author of this discussion paper

Nature Glenelg Trust (NGT) employs 12 professional staff based a number of regional locations situated between Goolwa in South Australia and Warrnambool in Victoria, working on a wide range of applied science projects; including a number that relate to wetland restoration and management. For more information about NGT, please visit: www.natureglenelg.org.au.

Mark Bachmann, Manager of Nature Glenelg Trust (pictured right), authored this paper with the collective input of NGT Senior Ecologists (Cath Dickson, Lachlan Farrington, Bryan Haywood and Nick Whiterod); professionally qualified staff with several decades of combined expertise in the South East region of SA and south-western Victoria. Their areas of expertise relevant to this discussion paper include wetland restoration and ecology, landscape environmental assessment and prioritisation, threatened species recovery (with a particular focus on aquatic species), and a thorough understanding of the history of drainage in the region and its impact on wetland species and ecology.

In this regard, through his previous employment, Mark was a member of the Environmental Management Advisory Group (EMAG) and various Technical Reference Groups advising the Upper South East Program from 2005-2011, and had significant involvement in earlier developmental stages of the South East Flows Restoration Project (then known as the Coorong South Lagoon Flow Restoration Project) from 2009-2011, including membership on the first project Steering Committee. During this time, Mark supervised the development of "*A Quantitative Ecological Evaluation of Alignment Options for the Coorong South Lagoon Flow Restoration Project*". The project report (by Farrington, 2010 – see below) recommended the Tilley Swamp alignment be used for conveying flows to the South Lagoon of the Coorong after assessing a range of criteria. The opportunity to enhance and restore the wetland values of Tilley Swamp en route to the Coorong (an issue raised in this discussion paper) was a key reason for this route being endorsed in the report as the preferred alignment for the South East Flows Restoration Project.

Supporting technical references by NGT senior staff (in bold) who contributed to this discussion paper:

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