

# Black River Corridor: *Visions for Restoration and Recreational Use*



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# The Black River Pathway Book: *A Preface*

Special thanks to Juan Nomdo, Crispin Barrett, and Clive James from the City of Cape Town's Department of Environmental Management, which sponsored the project. They worked closely with the authors of this pathway book: Michael Della Donna, James Sareault, Katrina Boynton, and Kiara Gravel. All are American university students from Worcester Polytechnic Institute completing an Interactive Qualifying Project at their university's Cape Town Project Centre. Also special thanks to the advisors of the team Scott Jiusto and Steven Taylor who were instrumental to the success of the project.



*The project team and sponsors on the Black River. From left to right, Kiara Gravel, James Sareault, Mike Della Donna, Crispin Barrett,*

The goal of this project was to aid the City of Cape Town in creating a vision for park and recreational spaces throughout the Black River Corridor to improve the socioeconomic potential of the river. This pathway book presents ideas and recommendations on the future of the Black River. It also strings together the many different visions of scattered stakeholders and interest groups in hopes that a collective effort on the river will form. To fulfill these visions, a pathway is the primary goal. A pathway along the Black River will bring awareness to the public on the state of the river and generate community involvement for groundwork restoration efforts. The route of the path and potential economic opportunities within these visions are discussed to provide recommendations for an interdepartmental task force to

continue with a multi-phase revitalization project for the Black River Corridor.

The Black River is a polluted and neglected waterway, yet the corridor also has a lot of worthwhile attributes already such as the location and the presence of desire lines. Since people are using the corridor despite the river's condition, it justifies establishing a pathway to promote the potential in this area. Case studies from around the world exemplify the plausibility of restoring a river in poor condition by first implementing a pathway. The present river conditions are explored to understand obstacles and opportunities in revitalizing the corridor. To preserve the continuity of the path, ideas to overcome certain barriers are also included.



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*This project was made possible by the City of Cape Town  
and Worcester Polytechnic Institute*

# The State of the River: *An Overview*

Rivers are natural waterways that run through cities all across the world. They are often accompanied with economic developments such as factories and plants which, while creating jobs, also pollute the water sources. As a result, many urban river restoration efforts have evolved in a post-industrial world. Communities have realized the consequences of neglecting and abusing rivers. Sites that could be flourishing, inviting areas have been devalued, and the need for change has arisen. Recognizing such efforts for change, this project is initiated to understand the communal relationships and powerful efforts from past river restoration examples to then create a feasible, sociable area benefiting multiple groups.

One particular waterway ripe for restoration is Black River. Located in Cape Town, Western Cape, South Africa, the Black River is part of the great-

er Salt River catchment system, which drains water from both Table Mountain and the Cape Flats into Table Bay. As a river system with many contributors, the Salt River catchment has served as an outlet for unwanted

waste. Consequently, some sections of this catchment are highly polluted. The Black River is one such section. Despite its uncleanliness, however, the river holds great potential for the community.

Although it is a very short river, the Black River flows through a wide range of Cape Town communities. The waters of the Black River flow through the affluent Southern Suburbs, the low-income areas in the Cape Flats, and the industrialized areas in the eastern City Bowl and Northern Suburbs. The variety of neighbourhoods that the river flows through pre-

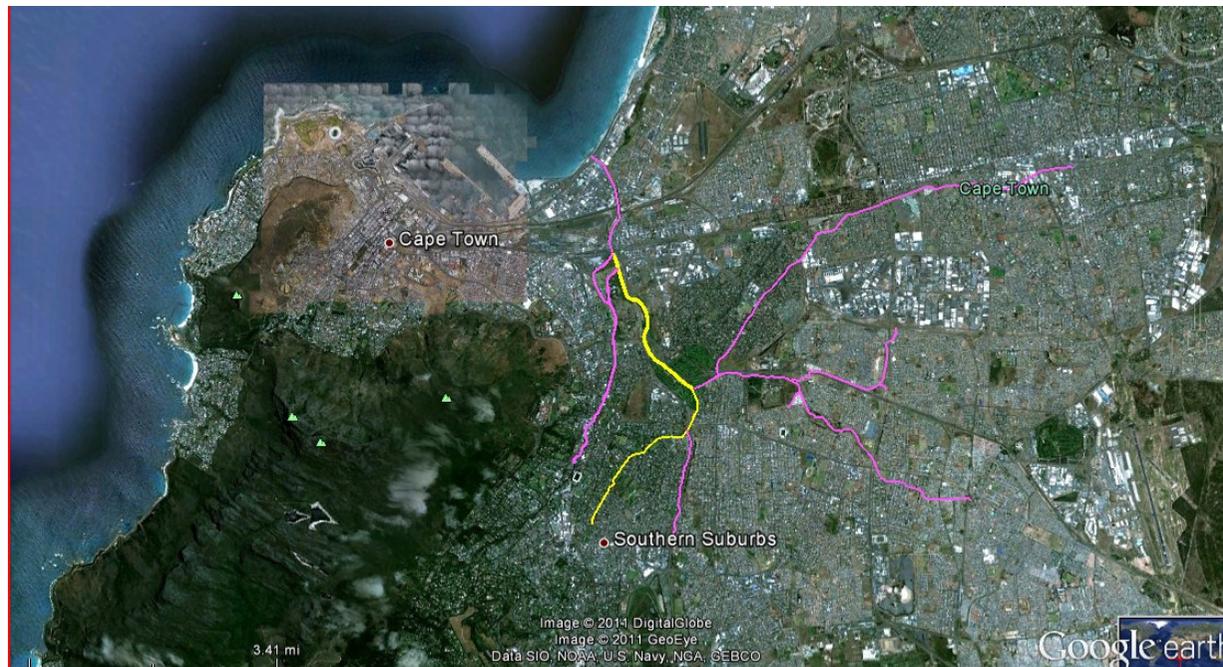
sents a variety of opportunities for uses of the river.

by stadiums, golf courses, and private businesses that can all

**The Black River is currently a detriment to the region when it could be an asset.**

Additionally, there is a lot of potential to develop the area in connection with existing city assets. There are several near-

contribute to the success of the area. A developing urban park area, called the Two Rivers Urban Park, can serve as a recreational outlet for nearby residents. The Black River and the surrounding river corridor can also be used to connect people who have traditionally been separated. All of these factors can combine to help make the Black River corridor a better place for the people of Cape Town, but this will not happen without the effort to improve the area. Rehabilitating the Black River will be an integral part of the success of any plan to advance the communities around the river. Due to high levels of pollution, however, the Black River can hardly be utilized by anyone in its current state.



Map of the Salt River catchment (Purple) with the Black River highlighted (Yellow)

## Two Rivers Urban Park

Already, the City of Cape Town is working with the Two Rivers Urban Park Committee, a local NGO, to develop Two Rivers Urban Park, or TRUP. TRUP is an area of land that stretches between the banks of the Black River and the Liesbeek River and is being used to create a multipurpose park. The development of this urban park aims to enhance the natural potential of

the area and encourage sustainable development. This opens the area up for recreational activities, cultural and heritage appreciation, and environmental prosperity. TRUP extends from the confluence of the Black and Liesbeek Rivers in the north and the N2 /M5 interchange in the south and contains all of the land between the banks of these two rivers. ("Two Rivers Urban Park Contextual Framework and Phase 1 Environmental Management Plan")

The Black River hasn't always been in the harsh condition that it is in today. It was an important source of water for herd animals, and remained mostly unchanged through the mid-20<sup>th</sup> century. With the construction of the Black River Parkway and canalization of the river to prevent flooding, the path of the Black River that we know today was created. The Black River is a mostly human-engineered river; its current course is caused by dredging that was intended to prevent serious flooding. Historically, it would have looked like a series of low lying wetlands that would flood together during winter. In 1943, the City of Cape Town took preventative measures to control the flooding by canalizing most of the river (Aikman

Associates, 2002). This method disrupts local ecosystems but prevents the weather from destroying the area's infrastructure. Because of this and pollutants from further upstream, the river has declined in health until it reached its current condition. Despite canalization of the river, the river can overflow its banks during the heavy rains of winter. As the seasons change, however, the rains dissipate and the flow of water through the Black River reduces. The water depth becomes extremely shallow during the dryer summer months, only reaching roughly 30 cm in height. This very dynamic water height scenario poses many problems for traditional aquatic navigation, and limits the ability of people to traverse the black river.

## The Pollution

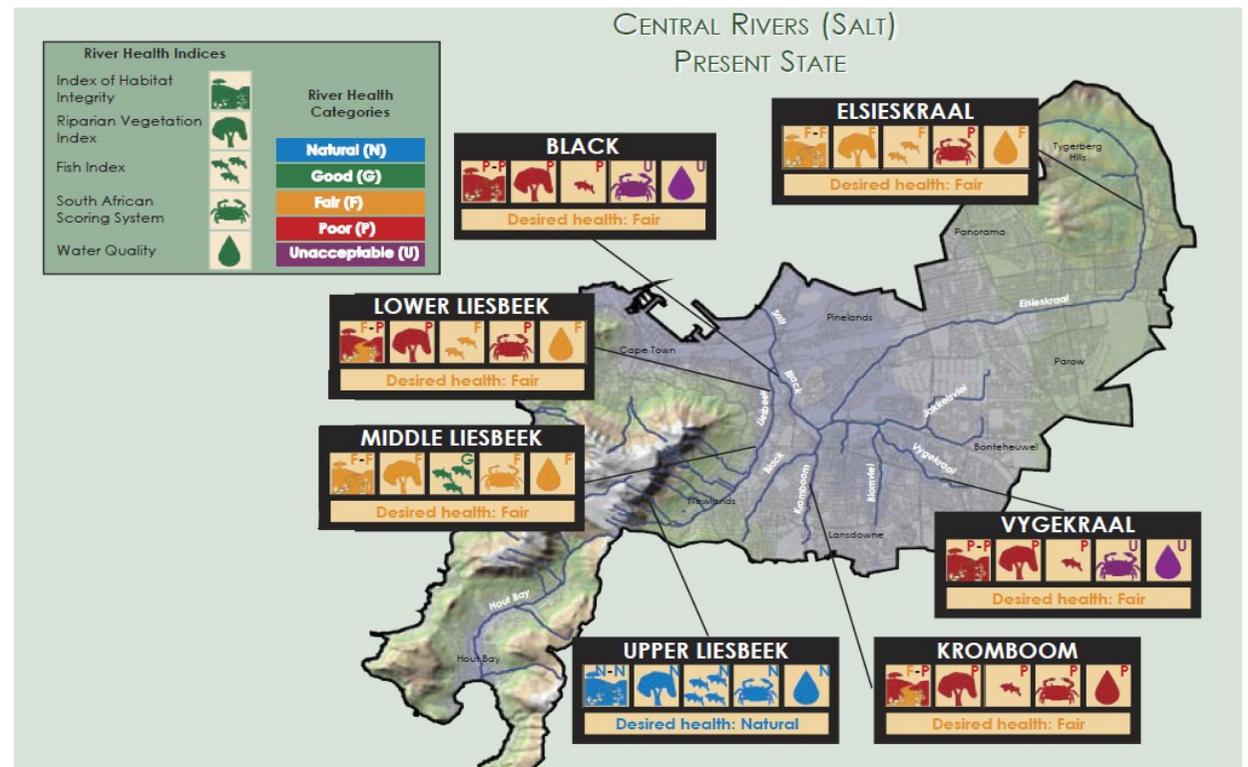
In its present state, the Black River is a river of problems. Decimated by many types of pollution, the river is unusable by the communities around it. Even small amounts of direct contact with the river can cause serious health problems. As a result, the river is a detriment to the region when it could be an asset.

The Black River's problems begin with the effluence in the river. From just looking at the river, vast amounts of physical

pollution are evident. Litter is scattered along the banks and refuse flows down the river. Invisible to the naked eye, chemical contamination flows through the waters for its entire length. Additionally, environmental pollution, which comes in the form of invasive plant species, is overwhelming the local ecosystem and creating a myriad of problems. Together, these troubles harm the people and the environment around the river

In its present state, the waters of the Black River are toxic

and not suitable for human contact. The levels of faecal coliform create a serious health risk to anyone who comes into contact with the river. Other pollutants such as E. coli also degrade the water quality in the river. The exact source of this pollution is very difficult to track down, but we can be sure that the vast majority of the toxins originate in the Elsieskraal and Vygekraal rivers. A narrower section of the Black River runs mostly through affluent suburbs to meet Elsieskraal and Vygekraal and form the larger



Maps indicating the river health of the Salt River catchment



*Water hyacinth overrunning the Black River in the summer months*

Black River that is the focus of this document. The Black River upstream of this confluence is nowhere near as toxic as it is after it meets with the other two rivers. From this we can determine that the main sources of pollution are along the E-sieskraal and Vygekraal rivers. (River Health Programme, 2005)

Looking upstream, it is easy to try and place a large portion of the blame on the Athlone Waste Water Treatment Works. Although the plant is currently over strained and operating at a near maximum capacity, the effluent that it releases into the river is still within city standards (Jordaan, 2011). The reason that the Athlone WWTW is strained is that problems with sediment build-up in the waste and grey water pipe system have caused an excessive amount of flow to be diverted towards the Athlone plant instead of the nearby Cape Flats plant. The Athlone WWTW is

not the main cause of sustained toxic water in the tributaries of the Black River.

In addition to the chemical pollutants, another problem facing the Black River is physical debris and litter. Litter flows downstream from the E-sieskraal and Vygekraal rivers where it is joined by refuse from the banks of the Black. The litter is deposited through illegal dumping, blown in by strong winds, and carried in through storm-water runoff. This litter and debris gets caught up along the banks and sides of the river, much of the time it gets snagged in clusters of water hyacinth, creating a tangled mess of invasive plants and trash.

Invasive plants and animals make up a third type of pollution—biological. When some species spread to an area with excess nutrients, they can thrive so much that they choke out indigenous vegetation and take over the area. Kikuyu, poplars

and wattle all have taken root in the region. Carp, catfish and tilapia have all overrun the native Cape galaxia. None of these invasive species, however, are as damaging as the water hyacinth.

The water hyacinth is a highly invasive plant that originated in the Amazon River of South America. It reproduces extremely rapidly, doubling in volume roughly every twenty days. This growth is increased in polluted systems with high concentrations of nutrients. It can reproduce asexually, so that even a small amount left behind can re-infect the entire system (Juries).

Water hyacinth grows so thick that it can cause blockages in the river, even damaging bridges if it grows around the support structures. If a large enough section of river is covered, it can even affect the temperature of the water, lowering it by a considerable amount. This

can have negative impacts on the ecosystem of the river. When trash gets caught in the water hyacinth it can cause stagnant areas of the river that are breeding grounds for mosquitoes and other pests (Juries).

Currently in Cape Town the water hyacinth is contained in the fresh water areas of the Cape Flats. It cannot survive in salt water and dies when it is washed out to sea. Every year the city spends millions of rand on the removal of this invasive species. Currently, the most common method of removal is to have people manually remove the plant from the river and leave it to dry on the banks until it can be collected and disposed. If any plant is left behind

or missed, it will return the following year (Juries).

Currently there are very few recreational users of the river, due to its toxicity and inaccessibility. Local fishermen are able to catch some of the invasive fish in the river, but must hold them in a tank, changing the water every day for almost a week before they are able to consume them. Even then the toxicity of the fish is questionable. Local children are warned against playing near the river, and its banks are inaccessible. A lot needs to change in order to improve this problematic river corridor.



*Water hyacinth builds up on a pipe across the Black River*

# Revitalizing Urban Rivers: *the Background*



*Pathways along the South Platte and Bronx Rivers*  
(Kiser, 2003; Trxr4kds, 2008)

The last two decades have seen a shift in attitude and policy with regard to urban rivers in developed and emerging countries around the world. Beginning in the industrial age and continuing for most of the twentieth century, urban river systems were canalized in an attempt to control water flow through cities. Rivers were engineered to adjust their paths, to control flooding and bank erosion, and to improve system drainage. Costly projects were undertaken to adjust nature for the benefit of man.

Every benefit of river canalization, however, also came with a detriment. The negative impacts of canalization on the ecosystem are vast. Concrete prevents plants from growing in the streams, which eliminates the food supply for first-order consumers and subsequently the entire food chain. This is devastating to the local ecosystem, eliminating fish and caus-

ing many birds to migrate elsewhere. Canalization can also have negative effects on floodplains. While people may want to adjust floodplains in order to allow development of nearby lands, this is not a sustainable practice. Floodplains actually provide a benefit to the surround-

ing lands by allowing the river to deposit nutrients into the soil. This enables riverside veg-

etation to grow and encourages wildlife to inhabit the area.

As a result of the large negative impact that canalized rivers can have on their environment, the general trend in public policy over the last two decades has been to remove the canals and restore water flows to their natural conditions.

ers results in large, costly projects.

During the initial background research phase of this project, two rivers were identified that related closely to the Black River. These two rivers were the South Platte River in Denver, Colorado, USA, and the Bronx River in New York City, New York, USA. These two rivers both shared similar traits to the Black River, and the restoration efforts of these rivers gave critical insight into how to revitalize an urban river.

The South Platte River before it underwent a restoration closely resembled the Black River in its present state. It was a seasonal river that became very shallow in the summer, but caused flooding issues in the winter. It also ran through a heavily industrialized area. The regeneration of this river started as a community based effort with the formation of the Platter River Development Committee. This all vol-

unteer committee garnered support for the project by taking influential members of the public on tours of the river. Once the river was in the minds of the public, they were able to make heavy use of volunteer planting and clean-up efforts. Today the South Platte thrives both ecologically and economically, and contains over one hundred miles of trails (Renn, 2008).

The Bronx River also had a lot in common with the Black River. The Bronx River has been so extensively modified by humans that it was impossible to return it to its natural state. The Bronx River restoration was truly community driven. Restoration efforts began with youth and church groups organizing small scale litter clean-up operations. These efforts drew public attention and eventually the Bronx River Alliance was formed. This group has initiated many improvements, including the replanting of native species and the establishment of multiple pedestrian trails. These trails have transformed the Bronx River into a popular recreation destination in the surrounding urban area (Renn, 2008).

Most South Africans are concerned with environment and the policies regarding it ("Angus Reid Public Opinion"). However this alone may not be enough to justify spending so much money on such a project.

***To validate river restoration, people need to appreciate a river's potential to improve***

Combining this process with an effort to reduce pollution in riv-

In order to validate a vast river restoration process, people need to appreciate the specific river and its potential to improve. This starts by getting people out along the banks of the river.

The easiest and most effective way of accomplishing this is through the construction of a non-motorized transportation pathway. Building a riverside pathway encourages pedestrian traffic along the river and opens the area up to bicycle traffic as well. In doing so, the pathway serves to provide an outlet for recreation as well as a course for transportation (Winter, 2011).

Pathways are most effective when they allow people to pursue the activities of their daily lives without hindrance or fear for safety. Due to the consistencies in the day to day lives of many people, directional transportation along a path is usually steady in the long run. In areas without formal pathways, such movement is usually visible in the form of beaten paths.

The route of this informal path, or the "desire line", is an established region of high traffic and is generally the best place to create a pathway (Burgess, 2011). The pathway may be built away from the desire line in order to avoid a floodplain or some other dynamic obstacle, but it should always be accessible from the

desire line itself. Similarly, the path should be able to connect with other outlets transportation in order to establish a link with other areas.

By linking several areas along a pathway or network of pathways, people have free access to travel to areas that may once have seemed inaccessible. This can create opportunities for people, potentially in the form of trade, employment, or even recreation. As seen in the case study, connecting people, even if only by foot, can result in socioeconomic benefits for the communities. Such potential creates a strong incentive for people to use a path, which subsequently increases the safety of the path.

A pathway's usage and its safety are directly correlated. As more people use a given path, would-be criminals face a greater risk to commit crimes in the area and crime is reduced. Additionally, more people using a path makes it easier to justify spending more money on additional security measures, perhaps by hiring a security guard or installing alarms or cameras. By creating a safe pathway for people to move about along the river, the communities around the river will have their attention drawn to the pollution problem and they will be motivated to bring about a change.

## Pathway Location



Desire lines play an important role in the planning of urban pathways. Desire lines are imaginary lines that represent the desire of people to navigate certain areas, and are indicated by existing informal pathways and trails that people use when there is no formalized pathway.

The usage of these pathways is critical to their existence, both from a security and maintainability point of view. [Burgess, 2011] Without use, the path will be unsafe, unused, and it will be hard to justify the costs necessary to maintain them. In order to encourage constant use of these pathways, they need to be constructed along pre-existing routes that people wish to trav-

el. The desire lines for the Black River are sometimes visible through aerial photography, but in certain areas they are much easier to locate on site at ground level. The desire lines along the Black River can be seen in the photographs on this page. Some of these paths are not particularly easy to replicate because they cross obstacles such as roads or rail tracks illegally. In these cases, an alternative crossing mechanism must be built in order to provide safe passage to the other side of the obstacle.

# The First Steps: *Non-motorized Transportation Pathway*

As discussed in Chapter Two, the first step to take towards revitalizing a river corridor is to bring the public's attention to the river. The goal of this chapter is to mobilize people to use the land around the Black River. In order to facilitate this goal, a non-motorized transportation pathway should be constructed along the river. Two major uses for such a pathway have been identified: transportation and recreation.

Area residents are already using land along the river for both of these purposes. Along the banks, area residents can be seen walking along formal and informal pathways. Interviewing these residents showed us that nearly everyone who walked along the Black River was either from or traveling to a community adjacent to the river, and was using the river because it provided a more direct route than could be achieved by following walkable roadways.

A secondary use for the pathway is recreation. The Friends of

the Liesbeek River have already explored the recreational potential for a riverside pathway. Along the Liesbeek, a pedestrian



*Non-motorized Transportation Pathway along the Liesbeek River*

pathway winds through a grassy park area while a bicycle path provides a more direct path through the park. The bicycle path provides a middle ground between the direct, albeit loud and potentially dangerous, roadways for motor vehicles and the

scenic, meandering pedestrian pathway.

In order to achieve the goal of getting people along the river, the non-motorized transportation pathway should be designed to provide both an efficient means of transportation as well as a safe venue for recreation. The design includes a footpath and a bicycle path as well as accessory installations such as footbridges, lighting, and emergency security systems. Due to time related constraints, the scope of this project was concentrated on the larger Black River. Therefore the pathway is bounded by the confluence of the Vygekraal and Elsieskraal, which marks the beginning of the Black River at one end, and the confluence of the Black and Liesbeek Rivers at the other end, which marks the beginning of the Salt River.

## The Vision

The path will run along the length of the river, but removed several meters from its edge. Leaving space between the river and the path allows for people to see the river while walking and will let people lounge close to the river without interruption from people using the path. Keeping the path off the edge of the river also allows people to use the path closer to winter, when rains can cause river levels to rise considerably.

The path will have two separate sections for use; one for pedestrians and one for bicycles.



*A possible route for the non-motorized transportation pathway*

Depending on the geography of a given section, these sections may be adjacent to each other or may be separated. This flexibility in design allows for the utility of each path to be maximized. The bicycle path will provide a more direct route between destinations and the pedestrian footway will allow for leisurely walks.

The pathway will connect communities that have previously been isolated by both physical and social barriers. Residents from communities in the Cape Flats have had their movement hindered by obstructions such as railroads and highways. This causes communal separation and hinders potential for economic growth. A pathway around these obstructions serves to increase people's accessibility to new areas and to new people

and opportunities. The pathway will join with existing pathways along the Elsieskraal River and use the existing footbridge over the Black River itself to connect the communities of Pinelands and Maitland with Observatory, Mowbray and Rondebosch on the opposite side of the River. Connecting these communities may create new business opportunities and stir economic development of the areas. An ongoing study by the City of Cape Town indicates the possibility of a redevelopment project on the site of the old Athlone Power Plant ("City of Cape Town official website - local government services"). Connecting with this community would serve to strengthen the pathway even more.



*Park and walk in a currently empty lot in Sybrandpark, near Hazndal Station*

A public recreation area that is open to people of many communities also serves to integrate them in an unimposing way. The construction of the pathway may allow people who have been isolated since the beginning of apartheid era politics to mix with those of other areas.

The walkthrough of this pathway will begin upstream, and then travel downstream towards the ocean.

### Hazendal Park

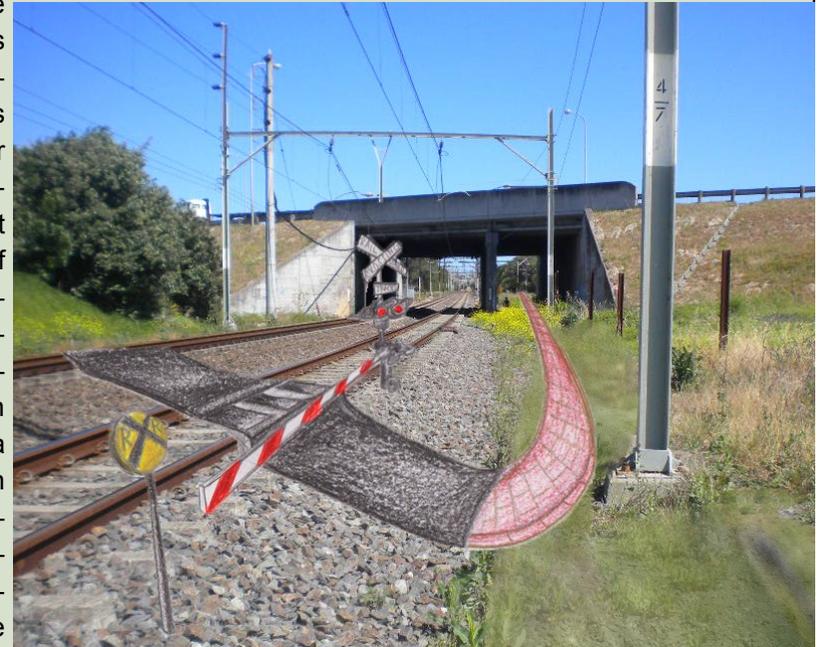
The proposed starting point for a non-motorized transport pathway along the river is near the Hazendal rail station. This point is significant because it marks the confluence of the Vygekraal and Elsieskraal Rivers. This is beneficial to the Black River pathway because it opens up potential opportunities

for a multi-river pathway network. As mentioned previously, the site of the old Athlone power station is being examined for redevelopment. This site is only a short way upstream and could be connected to this pathway system, greatly increasing its value. It also serves as a public access point for the path. In addition, this spot provides access from Hazendal rail station and the community of Hazendal itself. There is a large vacant lot adjacent to the river that provides multiple development opportunities. The main vision for this space is a park and walk, similar to the park and walk areas along the Liesbeek Pathway. This would provide a place for pedestrians to store their vehicles while using the path. Another possibility for this area is a small playground. In addition to these permanent fixtures, this

## Pathway Considerations: Railway Crossing

Creating a safe way for pedestrians to cross a rail line poses an interesting problem. Unlike cars, trains cannot stop in time if they spot an obstruction in their path. Therefore, creating a safe way to cross rail lines means keeping pedestrians out of the path of the train as much as possible. The first way to cross is to go past the tracks with a bridge or underpass. This is the safest way, because it removes pedestrians from the path of the train entirely. This method does come with some faults however. Constructing an overpass would make overhead power lines more accessible to vandalism, and it might not be cost effective for that area. Also, if the crossing is constructed using stairs, it would be an obstacle for cyclists. The second possibility is to use or modify an existing crossing such as a highway overpass or a station underpass. The highway overpass could be extended to accommodate a separate pedestrian route, or the path could be

-routed to go through an existing station underpass. The station underpass requires no existing modifications and the highway overpass limits the extent of new construction, because the power lines are already lowered under the over pass, which also reduces the chances of a pedestrian tripping over the tracks, or crossing as a train is approaching. This option provides a formalized crossing point for the tracks that would reduce the chances of a pedestrian tripping over the tracks, or crossing as a train is approaching. The third and most dangerous option, yet most cost effective at any point is to put in a pedestrian rail crossing, much



location could serve micro-enterprises by providing a weekly bazaar site for artisans.

The site is very open for the most part, with good visibility in all directions. Lights would be required to ensure safety along the path at night, as well as keeping the N2 underpass well lit. Apart from lighting, the area should be relatively safe, with close proximity to Hazendal rail station that will have security personnel. This area would be a good location to implement an emergency phone system.

## Rondebosch Golf Course

Continuing on from Hazendal moves the path either through or around Rondebosch golf course. Going around the golf course causes less debate but is undesirable in terms of increasing public access to the river.

It is imperative to the goal of the pathway that it runs as close as possible to the river, which means crossing through Rondebosch golf club. Placing the pathway through the course also increases the visibility of the course in terms of public, and will help spur public interest in the river, which will in turn help the club as a riverside stakeholder. Proposing a public pathway through a golf course will often cause turmoil, however. Golf Club members were resistant to any access to their club by anyone other than golfers.

The first major issue for the club is safety of the pedestrians crossing through the course. It is possible that an errant golf ball could strike an unaware pedestrian and cause injury that would leave either the golfer or golf club liable. The second issue is ensuring the safety of the golfers on the course against malicious persons and vandals. The third issue relates more to the game of golf itself. The sport of golf maintains an atmosphere of quiet and calm to aid in the concentration of the players. There is concern that allowing pedestrians access to a path along this playing field would disrupt this atmosphere. The solution to these issues lies in the construction of both the access points to the path and the path itself. The entrance points to this pathway would either need to be access controlled or carefully monitored.

Actively monitoring the entrance allows for much more freedom than the access control option and is much better for the goal of the path, because it promotes unrestricted public access to the river. It would involve either a guard or a camera that would identify all incoming path users through an unrestricted access point. Signage would need to be posted warning users of the path about the dangers of errant golf balls.

An access controlled area would be protected by a gateway to the path. Users of the path would need to obtain some sort of access key that

would grant them entry to the path. The advantages of this system are that by acquiring this key, path users could indemnify the course and its patrons against liability from potential injury. This would also ensure that path users are educated and knowledgeable about the risks of such a path. Another advantage of this system is that it places a sense of responsibility on the key holder to act accordingly while on club grounds. If an electronic access system were to be put in place; the benefits would be even greater. With an electronic system, the course would know which users were on the path at a given time, and have an access log that would show when people entered and exited the course. This greatly increases the sense of responsibility that users of the path feel. This also means that access could be granted or revoked on a user by user basis, and that the keys could be renewed on a yearly basis.

The construction of the path itself also contributes to beneficial use by all parties involved. The optimal path through the course would be a monitored, open path with no fences or restrictions. This is the most visually appealing approach and supports the theme of public access and discouragement of barriers. This path would need to be monitored, with the level of observation roughly corresponding inversely to the level of access control at the en-

trance points. If it is determined that some type of barrier is required, there are several options.

A high fence is the most secure option, but is also aesthetically displeasing and difficult to conceal. This would prevent anyone on the path from accessing the rest of the course, but would partially negate the path as a way to enjoy the natural beauty of the land surrounding the river.

Another option is to use landscaping vegetation, such as trees, bushes, and shrubbery to create a dense barrier. This is more aesthetically pleasing, but does not physically prevent people from entering the course and may block the golfers' view of the river. One advantage of this method is that it better separates pedestrians without putting up an impenetrable wall. It may prove to be difficult to plant so much vegetation along the path though. This moves us to the third option.

This option is a hybrid of the other two options. It would consist of a low fence or wall, 75 to 100 cm tall, which would provide continuous separation between the path and playing field along the entire length of the river. This would reinforce the psychological aspect of the barrier and clearly denote possible malevolent persons who cross it. This low, unobtrusive fence or wall would be supplemented by landscaping trees or bushes that would serve to preserve some level of separation between path and playing field, but not to the

same extent as if there was no wall at all, because not much vegetation would be required.

## Interchange Park

After traveling through the golf club, the path moves through Raapenberg pump station. The advantages of using this pre-existing pathway are that the pump station is already maintained by the city and there is already an asphalt pathway along this section. This part of the path would be mostly a conduit section, providing a route between the golf course and Interchange Park. Adding trees along the banks of the river would make the walk more pleasant and add shade for pedestrians.

Crossing Raapenberg Road to access the section referred to in this document as Interchange Park is currently very difficult for pedestrians and cyclists. Safe crossing is difficult because of the high rate of speed of traffic along the road. The following are two possible options for safe passage over the road.

The first option is to put in a traffic robot to stop traffic and allow pedestrians through. This is the easier option, but may not be possible due to heavy traffic flow. The more complicated option which has less of an effect on traffic is to put a pedestrian overpass across the road. This could be implemented as an extension to the existing M5 overpass.



*Recreational areas in Interchange Park*

Once over the road, it is relatively easy to access both sides of the river because of an existing bridge across the river that could be modified to be more pedestrian friendly.

With the addition of the proposed pathway, access will be provided via the park and walk next to the golf course and Hazendal rail station. The park provides a place to relax and could be the site of many different land based activities. There is also a small pond in the middle of the park that is ecologically rich and could be the site of a future bird hide. The pathway around this area would form a complete circuit, to allow park users to jog or stroll around the area. Benches

would be placed adjacent to the pathway to allow pedestrians to



*Artist rendition of the future of Interchange Park*

stop and rest if needed. The addition of benches gives people a chance to stop and enjoy the wildlife and natural beauty of the area. Planting more trees or putting in a sports field would also increase the desirability of the area. Planting trees helps with social awareness and the environment as well as teaching others about a sustainable ecosystem. Labelling the trees along the walkway provides an educational opportunity, similar to the signs posted in Kirstenbosch Botanical Gardens. There, all the flowers, trees and other vegetation are labelled with names and a description of the plant, as well as common uses. This type of signage promotes tourism and provides educational opportunities for students. The park could serve as a



*Computer rendering of a pathway behind a vision for a redevelopment of Oude Molen Eco-Village, developed in conjunction with Worcester Polytechnic Institute's Cape Town Project Centre (Brandmier et al., 2011)*

terminal point for the path at this time. To continue the path here would mean construction of a large pedestrian overpass across the N2, or an underpass beneath the N2. At this section, the overpass is preferable to an underpass using the existing bridge over the river. The bridge has a very low level of clearance over the water, and moving under the N2 at that point would necessitate the construction of another underpass or over pass several metres away to cross the M5 off ramp. The overpass over the N2 could be moved slightly east so as to cross all eight lanes at once. Until one of these projects is completed, the park will serve as a temporary termination point and path users will be able to continue by driving to the next section.

## Two Rivers Urban Park

### Maitland Garden Village & Oude Molen Eco Village

The second half of the river runs straight through Two Rivers Urban Park. There are many entrances into this area, including an existing Two Rivers Urban Park archway located in the parking lot of Vincent Pallotti Hospital. It is also possible to enter from Oude Molen Eco Village, Perseverance road, and the Valkenberg pedestrian bridge. The pathway in this location runs along the river as well as making a circuit for people to enjoy the wetlands. This area enjoys a diverse ecological system that could be the site of multiple bird hides.



*Future recreational possibilities in Two Rivers Urban Park*

Across Perseverance road, the path will continue along the river behind Maitland Garden Village. This spot would serve as an excellent recreational venue for residents of the community to relax. Existing Two Rivers Urban Park framework documents have suggested an informal “kick-around” field at the edge of the driving range, protected from golf balls by a barrier system.

### Valkenberg Hospital and Raapenberg Bird Sanctuary

Next, the path continues across Valkenberg Bridge. The bridge currently enters the Valkenberg Hospital complex directly, so a pedestrian moving over the bridge would exit into the hospital complex, and then need to cross through the complex and exit in order to reach

the Raapenberg Bird Sanctuary. The Valkenberg Hospital complex contains a number of buildings with significant historic value, and heritage tours could be an asset to the area that would also draw tourists. Despite this, the hospital management is unlikely to welcome the level of through traffic expected on this pathway. Ideally, wetland access should be immediate from the end of the bridge, without having to first cross through the hospital. This can be accomplished by disconnecting the hospital fencing from the end of the bridge to allow pedestrians to exit onto the proposed pathway. There are two proposed path options to continue from this point. Path option one would be to move along the fence of the Valkenberg complex, eventually meeting up with the current entrance of the Raapenberg

## Oude Molen Eco-Village

Oude Molen Eco Village is situated on the Black River, on the former site of the Valkenberg Hospital complex. This places it a short distance from downtown Cape Town in Pinelands. OMEV began in 1997 as an effort to create a community of ecological micro-enterprises. So far this includes a café, horse stables, a youth education garden, artist workspace, backpacker lodges, and educational institutions. The property is currently owned by the Western Cape Province, which is preparing a regeneration plan guide property development. The goal of this plan is to generate state revenue and advance other social goals (Jiusto 2011).

Oude Molen Eco Village is another riverfront community that is a stakeholder in the revitaliza-

tion of the Black River. As tourism makes up a large portion of Oude Molen’s economy, a beautiful, useful river would greatly benefit the village. New additions to the community could be centered around the river. The coming regeneration plan for OMEV could certainly take into account improvements in the Black River and how it is used as a resource for the community.



## Maitland Garden Village

Maitland Garden Village (MGV) lies on the Black River between Oude Molen Eco Village and the confluence of the Black and Liesbeek Rivers. MGV is a historically coloured community, and as such must deal with remnants of years of inequality under Apartheid. Problems that arise from this include high unemployment, drug and alcohol abuse, geographic and social isolation, poorly maintained housing, and limited youth opportunities. At the same time, MGV also houses a primary school, crèche, soccer field, and community group. Even though the village faces many problems, crime levels are low (Jiusto 2011).

As a riverfront community, MGV stands to benefit greatly from any river restoration pro-

gram put in place, and as a major stakeholder, would need to be consulted when creating a vision. A revitalized river could potentially spur an increase in jobs, due to new opportunities for businesses and maintenance. Large plots of undeveloped land are located adjacent to both the river and MGV, creating a situation in which the community best interests lie in revitalizing the river.



## Pathway Considerations: Horses

As the path moves through the Vincent Pallotti wetland behind Oude Molen Eco Village, it is important to consider the equestrian aspect of the community. As readers may or may not be aware, there is an enterprise located in Oude Molen that maintains a significant number of horses. This impacts pathway construction in two important aspects: security, and construction material of the pathway. The first impact is a positive one. Horses are much more suited for patrol of the wetlands than either people on foot or wheeled transportation. With Oude Molen's continual horse rides and lessons, there will be a constant, highly mobile

presence in this area offering a safer atmosphere for the path.

The second impact is pathway construction. Brick and Timber boardwalk don't hold up very well under constant use by horses because of the horses metal horseshoes. Also, some precast concrete pavers with large enough gaps can potentially injure the horses. Therefore, special considerations have to be made when selecting a construction material for this section of the pathway, such as using a horse friendly paving material or establishing a separate track for horses.

berg wetlands. Path option two is to travel along the edge of the river until Observatory Bridge. Both of these paths should move around the marsh areas that are home to multiple species of birds. The path along the river is more desirable because it retains the goal of the path in providing river access to the public and has less of an ecological impact by not disturbing birds that have built nests along the fence.

At this point the path enters the Raapenberg Bird Sanctuary. The existing entrance is

run down, and not very accessible. There is an informal pathway running from this entrance to Observatory Bridge, and there are two bird hides in this location. The two bird hides are not well known to the public, and receive few visitors. The proposed path for this point would clean up the entrance to this area, and formalize the pathways. Another goal would be to add signage indicating the existing bird hides as well as the new ones. In this sense the signs could create a flow and purpose for this sec-

## Pathway Considerations: Security



### Reed Bed Security Considerations

Passing through the Raapenberg Bird Sanctuary places the path adjacent to wide areas of marshland. This marshland contains very tall reed beds and poses a unique security concern. During the winter months, the marshes flood and prevent access to the reed beds. During the summer months however, the waterline recedes to the center of the marshland, leaving the tall reeds near the edge dry. These tall dry reed beds have proven to facilitate muggings and assaults. One solution to this problem is to add a barrier, such as a fence, that substantially increases the difficulty of either entering or leaving the marsh.



### Blue Light Security Alarms

Blue light emergency intercoms are commonly deployed across college campuses and serve to provide quick communication with security personnel. These systems often contain some combination of intercom or telephone, and a light or siren. When activated, they connect to an emergency line that allows communication with a dispatcher and alerts security personnel. They may also activate a flashing blue light or siren to notify potential aggressors that security personnel have been alerted and are on the way. These locations can also be monitored by camera to provide another layer of safety while discouraging misuse and negating false alarms.

### Bird Hide Security Considerations

Bird Hides are a valuable resource in terms of ecological education and tourism. Bird hides allow people a place to watch birds without disturbing them while offering shelter from the elements. Unfortunately, due to the latter feature, it is necessary to make sure that these hides do not become a temporary residence for someone, as well as mitigating vandalism and violence. One way to do this is to remotely monitor each hide. An intercom and camera could let a guard know when birdwatchers wished to use the hide, and the guard would be able to monitor the use of the hide and maintain the safety of the area.



*The historical appeal of Valkenberg Hospital can be used to create a tourist attraction*

tion of pathway, establishing some kind of bird watching circuit by guiding bird watchers and tourists to different bird hides.

This section has the potential to connect the communities of Maitland, Observatory, Oude Molen, and Maitland Garden to Two Rivers Urban Park, the proposed city wide non-motorized transport network, and areas upstream such as Athlone, Hazendal, and Sybrandpark.

### **Berkley Park**

The final section of the path is located across Observatory Bridge between the river and the M5. This section approaches the confluence of the Black

and Liesbeek Rivers, marking the beginning of the Salt River which is outside the scope of this project. This park will serve as the terminal point for the path on this end, because continuing further down the river would lead into a heavily industrialized area of private land, and continuing the pathway would mean crossing several multiple-line rail bridges. Despite this, discussion with community members has uncovered interest in green initiatives near the Salt River area, including plantings, beautification efforts, and generating green energy through tidal forces.

Creating a park at this point allows connectivity with the community of Maitland, provid-

ing them with important recreational open space. A park and walk at this area would also allow communities farther away to utilize the park and the path. This would also mean that each end of the path would have its own park and walk, allowing users of the path more flexibility. It also places the ends of the park near two different rail stations, Hazendal and Koeberg. Currently this section is dominated by construction debris from development on the M5 itself. Obviously the debris and equipment storage here is temporary, and in some ways the existing damage to the environment allows the revitalization process for this section to start from scratch with a lot of potential. A park at this location could make use of a number of different amenities, such as bird hides, owl boxes, picnic benches, or playground equipment. The team also spoke to a community member who advocated a camping location at the site. Overall, this site would serve as an asset to surrounding communities, and draw pedestrians to the pathway.

# The Potential: *Future Opportunities*

After public awareness of the Black River becomes well established, additional projects will likely be easier to justify from a political standpoint. These projects can aim to develop the area for recreational use or create commercial opportunities. These projects are generally larger in scope and would require significant funding to complete. After the public begins to use the formal

pathway and the land in the Black River corridor, however, such capital expenditures are justifiable to the government as economically redeeming.

The first project proposed is a clean-up of the river. Removal of existing pollution and elimination of pollution sources can begin to provide a better future for the river. By improving water quality, many opportunities begin to open up.

Water that was once unhealthy can support activities such as fishing or swimming.

In order to bring the river to a usable state, river clean-up must target all three types of pollution that plague the river today: physical, chemical and environmental. The presence of just one type of pollution will negatively impact the potential of the river for recreation; sometimes this presence will render recreational activities totally unfeasible. Litter, found along the banks of the river as well as in the water itself, can be removed easily and without requiring much additional equipment. The removal of invasive plant species will require extra effort to make sure that none of the plants remain, but a clear waterway is needed for transportation through the river. Clean-up of the chemical pollution is the most complicated aspect to clean up, as the contamination comes from a multitude of sources along different tributaries. (River Health Programme, 2005) Despite the complexity in improving the river quality, it is an essential step in unlocking the potential of the Black River.

The second project is to engineer a sustainable flow for the river. Because the water is so shallow in the summer months, it is not possible to use the river for many aquatic activities. With the introduction

of dams in the Black River, however, this could change. Dams could increase the depth of the river so that it is navigable by boaters and deep enough to swim in. A dam would restrict water flow for a short period of time as the water level rises, and then allow the water to flow similarly to the way it did before construction. There are also benefits such as increased oxygen in the water downstream of the dam, and the potential to generate electricity by using the water to power turbines. Should the water level rise to a level where it would impact low lying bridges or other constructions, it may be beneficial to dredge the river so that the water can flow past the obstacles without creating damage. As with all of these major projects, an

environmental impact assessment would need to be completed in order to determine the sustainability of these actions. If desired, flood gates could help control the effects of flooding in the event of severe rainfall. Any such project will require careful planning to make sure that the ability of the river to resist flooding is not hindered. As noted in Chapter Two, there are positive aspects to floodplains, so any engineering project that adjusts the floodplain will have to take this into consideration.

Although these projects may require a significant capital investment, they open up the river to a wide range of activities. These activities may serve the people of the surrounding communities by opening up economic



*River cleanup efforts along the Liesbeek River*



*The Blas Brisoli dam on the river Malargüe, in Malargüe, Argentina  
(Flores, 2007)*



*A water taxi currently transports tourists between the Central Business District and the V&A Waterfront*

opportunities or by just providing simple enjoyment, but either way these projects will be creating a positive impact on the area and the city as a whole.

One of the first projects that community members expressed interest in was establishing a route for a water taxi. By making stops at frequently visited locations, the existing water taxi on the Roggebaai Canal between the V&A Waterfront and the Cape Town International Convention Center has been proven as a popular tourist attraction. This project could involve expanding the existing route used by the Roggebaai taxi or establishing a separate route. Continuing the existing service to Athlone Stadium would encourage tourist travel to these otherwise

non-tourist areas. This would increase the customer base for businesses in the Cape Flats district near the end of the taxi route. These areas traditionally do not see much tourist traffic; a water taxi would encourage tourists to visit the area. If the taxi proves to be economically efficient, it may be a viable option for mass transit of lower income residents.

Kayaking and canoeing have been suggested by multiple community members as recreational opportunities that they would like to pursue. Suggestions ranged from being able to canoe down to the ocean towing a surfboard to being able to cross the entirety of the peninsula using only rivers. As kayaking and canoeing become more popular on the river, it will be possible to

open a rental business to serve tourists in the area as well as watercraft enthusiasts. Interest in using the river as an aquatic trail has already been demonstrated by local interest groups. The Peninsula Paddlers, a group of volunteers that crossed the Cape Peninsula using only water ways, paddled up the Black River in kayaks to raise awareness of the plight of the river (Lee, 2011).

Another idea brought to light by community members was the implementation of an Olympic rowing course. This requires at least two straight

kilometres and deep enough water to navigate by boat. Having an Olympic-sized rowing course improves Cape Town's chances of hosting the summer Olympic Games. A regulation-sized course could also attract athletes for an international competition, similar to the Henley Royal Regatta in London or the Charles in Boston. City officials indicated that research has been done on the feasibility of a course of this type, but the project team was unable to obtain the report.

Beginning with preparations for the FIFA World Cup in 2010,

Cape Town has been improving infrastructure throughout the city. An Olympic bid in the future is not out of the realm of possibility; one of the main reasons for not submitting a bid in the past was that the old Green Point stadium would have had to have been replaced (Abermann, 1993). A new stadium has already been built for the World Cup. This type of infrastructure upgrading is conducive to maintaining Cape Town's place on the world stage.



*The Sydney International Regatta Centre, an Olympic rowing course in Sydney, Australia (Hectic18, 2007)*

# Now What?

## *Conclusions & Recommendations*



*Urban Parks can be major attractions for tourists and residents alike*  
(Fano, 2004)

The current state of the river is harmful to both the environment and the people that reside around its banks. The water is toxic and filled with the same litter that lines its banks. The local vegetation has been largely replaced by alien species that use up essential nutrients and choke out indigenous plant life. The few areas that are pleasant are largely inaccessible, and the areas that are accessible are poorly maintained and lack recreational facilities. According to the South African Constitution, everyone has the right to an environment that is not harmful to their health or well-being and to have the environment protected for the benefit of present and future generations. The current state of the Black River infringes on this right. It doesn't have to be this way, though.

The City of Cape Town needs to begin the process of rehabilitating the Black River now. The current state of the river is detrimental to ongoing development efforts in the sur-

rounding area. Areas like Two Rivers Urban Park are being held back by the river. The execution of the revitalization of this river has the potential to support Cape Town in fulfilling its role as the World Design Capital of 2014. With South Africa looking to submit a bid for the 2024 Olympic Games, a feasible venue for aquatic competitions may make Cape Town a more appealing candidate. Such a venue could also allow Cape Town to host international competitions independent of a gigantic event such as the Olympics. There are a multitude of future possibilities for the Black River Corridor.

The Black River has great future potential. It could become a major asset for suburban Cape Town. It could become an attraction to both Cape Town residents and tourists, similar to New York City's Central Park. There are places along the river that could be developed into superior recreational areas with minimal effort.

Unfortunately, it is not possi-

ble for the sponsor of this visioning project, the City of Cape Town Department of Environmental and Heritage Management to achieve significant results on their own. The authors of this document recommend an interdepartmental task force be convened whose mission is to instigate and oversee restorative actions with respect to the river. This task force would include members from several different departments in the city, and work closely with both the province and community action groups such as the Friends of the Black and Vygekraal Rivers. Although individual departments may have

their separate projects that they are working on, designating representatives to join the task force will allow these departments to work on a large project without designating a lot of resources. Outlined below are recommended actions for the task force to accomplish towards its ultimate goal of revitalizing the river.

### **Appoint a river restoration expert to guide the task force**

The amount of information available about previous river restoration is enormous. The time it would take for all mem-

bers of the task force to familiarize themselves with the material is so long that doing so would be impractical. The expert could serve as a sort of human database, not necessarily containing all the answers, but knowing how to point people with questions in the right direction and understanding the common themes in various river restoration projects. Familiarization with previous restoration efforts is key to making critical decisions about this effort moving forward.

### **Increase the community's involvement and awareness of the river.**

This is a complicated, multifaceted goal that includes many different steps. The most major step, which is also the main focus of this document, is making the river as accessible to the public as possible by creating a path along the river. The role of the task force in this will be to push the project forward. Another important step is to increase awareness of the general public. In reviewing other studies of river restoration efforts, a significant source of funding came from private and corporate donations. Along with this, a large amount of labour capital was saved through community based clean-up and planting operations. Funding is critical in restoration projects and often although some capital

is required to start, continued operations and restoration thrive through community support.

## Begin construction of the pathway at Two Rivers Urban Park.

Choosing this location as a starting point has many advantages. The pathway could be created in conjunction with the on-going development of TRUP. This area also has relatively few obstacles to construction—there are existing bridges to allow for passage across the Black River and the M5 which could be utilized for the pathway and there are no private developments that would have to be circumvented along this area. Opening up these bridges and creating a formalized pathway through TRUP can begin the process of connecting the surrounding communities.

## Eliminate the sources of pollution in the river.

While some members of the task force are beginning the creation of a pathway, other members should look into the causes of the river's problems. This could come in the form of a point-source, such as a pipe from a factory spilling effluent into the river, or it could be in the form of a line-source, such as runoff from a highway that runs along the side of the river.

Only after these sources of pollution are identified is it possible for them to be neutralized. Publicizing the sources of pollution can begin to create public pressure to eliminate them.

## Develop an environmental education program about the river.

When the source of pollution is the public itself, a different approach to eliminating the pollution is required. In the case of a group of people chronically contributing to the pollution problem, it is necessary to develop an education program to stop this. By educating the people who live and work along the river, particularly in the upstream areas, the river health can be improved in a sustainable manner.



*"Zibi bins," part of the City of Cape Town's recycling education program*



*Informal settlement upgrading will be an essential part of eliminating pollution sources.*

## Improve riverside informal settlements

In some places, however, an educational program will not be enough. At least one of the tributaries that flows into the Black River also passes by an informal settlement. These areas of low-income informal housing pose a unique threat to the health of an adjacent river. Although the people of that community may depend on the river, they must be able to use it sustainably. Currently they may be using it for waste disposal as well as a source of water. Even if they aren't actively abusing the river, urban runoff in these environments is far worse than formalized urban areas. By upgrading and formalizing these areas and controlling policy regarding river usage, the level of impact these areas have on river health can

be mitigated, and community well being can be improved.

By taking these steps towards rehabilitating the Black River, the City of Cape Town is acknowledging a current problem and taking initiative to solve it. Although it may not be the easiest project to complete, it should be completed for the sake of the people of Cape Town.

While the difficulties in starting this restoration are formidable, the benefits of revitalizing the Black River are enormous. A revitalized river would provide a stimulus to the area in terms of property values. A safe non-motorized transport route along the river would help alleviate congestion in the traffic system. Easily accessible parks would provide a recreational outlet for people to enjoy nature. Alt-

hough there are certainly costs associated with the project, these are greatly outweighed by the benefits that the project will achieve. The revitalization of the Black River corridor is an investment in the future of Cape Town.



# References

- Abermann, Larry. South Africa. Cape Town City Council. *Culembourg - Black River Contextual Framework Stage A Report Preliminary Contextual Analysis*. 1993. Print.
- Aikman Associates, Heritage Management. South Africa. Department of Environmental and Heritage Management. *Two Rivers Urban Park Baseline Heritage Study*. Cape Town, 2002. Print.
- "Athlone Power Station Public Participation." *City of Cape Town official website - local government services*. N.p., 2010. Web. 15 Dec 2011. <<http://www.capetown.gov.za/en/athloneppp/Pages/default.asp&xgt;>>.
- Brandmaier, Christopher. et al. "Vision Document for the Oude Molen Eco Village." Worcester Polytechnic Institute, 2011.
- Burgess, Claire. Personal Interview. November 22nd, 2011. *Claire Burgess is a Landscape Architect who worked on the Liesbeeck river pathway*
- Justo, J. Scott. *WPI Cape Town Project Centre 2011 Projects Overview*. Worcester Polytechnic Institute, 2011. Print.
- Jordaan, Robert. Personal Interview. November 1st, 2011. *Robert Jordaan is the Athlone Waste Water Treatment Plant Manager*
- Juries, Maurietta. South Africa. Environmental Management. *Alien Plant Invasion*. City of Cape Town: , Print.
- Lee, Alison. "Peninsula Paddle Highlights the plight of Cape Town's inland waterways." *The Scenic South*. N.p., 2011. Web. 15 Dec 2011. <<http://www.scenicsouth.co.za/2011/05/peninsula-paddle-highlights-plight-of-cape-town-waterways/>>.
- Renn, Julia M., et al. *The Case Studies Guide: Conceptual Alternatives for Onondaga Creek*. Onondaga Environmental Institute, May 2008. Print.
- River Health Programme (2005). *State of Rivers Report: Greater Cape Town's Rivers*. Department of Water Affairs and Forestry, Pretoria
- Shepherd, Desiree, and Cass Gaisford. South Africa. *Two Rivers Urban Park Landscape Framework (Phase 2 EMP)*. City of Cape Town: , 2006. Print.
- South Africa. Environmental Management Branch. *Two Rivers Urban Park Contextual Framework and Phase 1 Environmental Management Plan*. City of Cape Town: , 2003. Print.
- "U.S. Out of Step With World on Environment." *Angus Reid Public Opinion*. Angus Reid Strategies, 2006. Web. 15 Dec 2011. [http://www.angus-reid.com/polls/6529/us\\_out\\_of\\_step\\_with\\_world\\_on\\_environment/](http://www.angus-reid.com/polls/6529/us_out_of_step_with_world_on_environment/)
- Winter, Kevin. Personal Interview. November 22nd, 2011. *Dr. Kevin Winter is the Lead researcher in Urban Water Management at the University of Cape Town*