BAYNESPRUIT REHABILITATION

In fulfilment of the terms and conditions of the Memorandum of Understanding to facilitate the successful implementation of the uMngeni Ecological Infrastructure Partnership (**UEIP**) Strategy

UEIP Origin

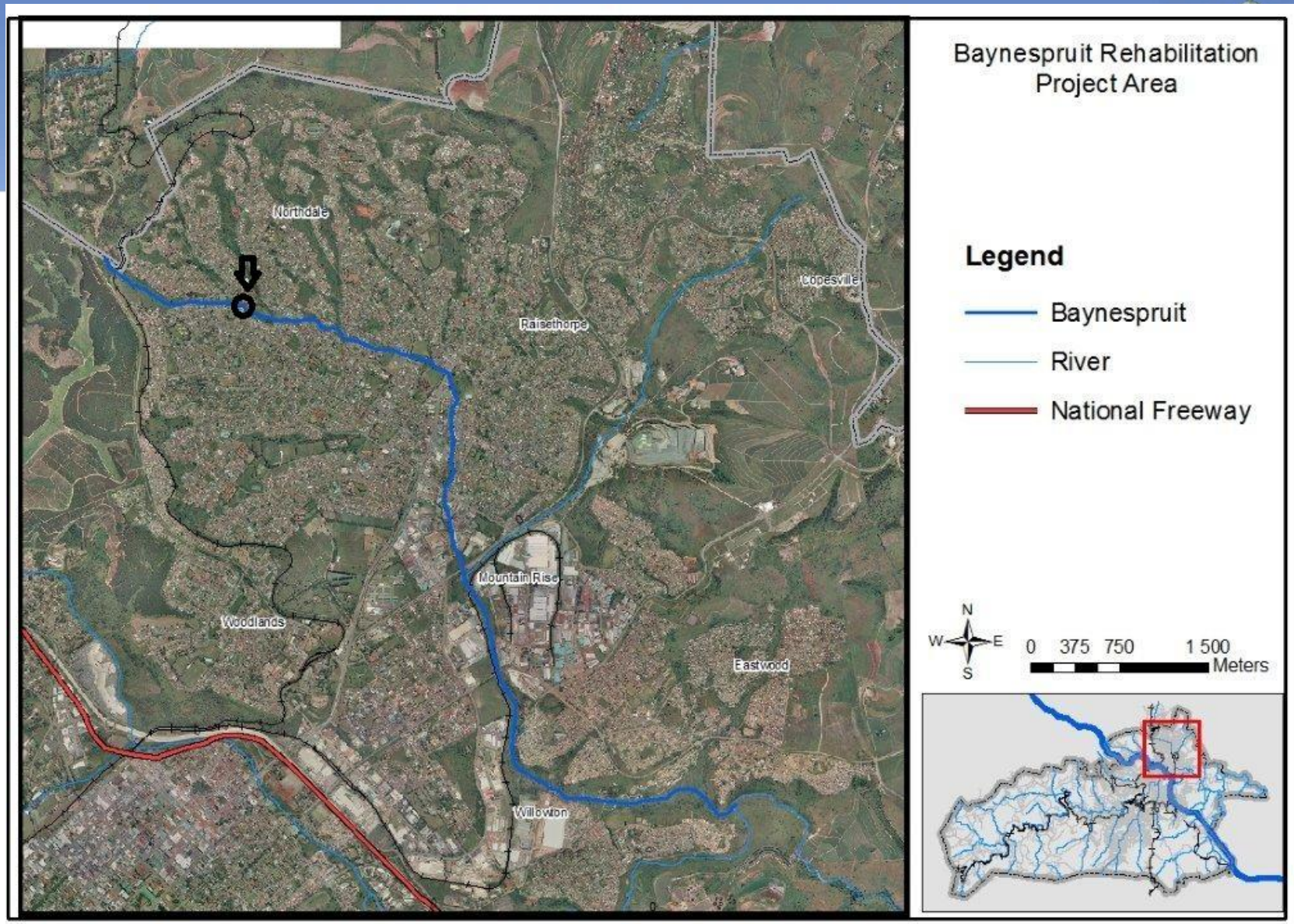
- “The original drive to get environmental infrastructure on the table came from Kevan Zunckel who was doing work for SANBI at the time. He and SANBI met with Neil McCleod and Debra Roberts who thought EI was a compelling concept. Neil said we can no longer ensure the water supply of Durban purely with hard infrastructure. We need ecosystems to be operating effectively and do their work”.

- “It was agreed that to engage effectively a partnership was required and so the UEIP was formed. Currently there are approximately **20 signatories to the Partnership**. At one of the early meetings it was agreed that each water authority (eThekwini, uMgungundlovu, Msunduzi) should have a pilot project and Rodney selected Baynespruit. UMDM are championing Save Midmar and eThekwini is moving forward to rehabilitate the Palmiet”.

Quoted from: Mr. Duncan Hay (Interim UEIP Coordinator)

Role Players

- Sobantu Farmers Association
- Ward committees
- Ward councilors
- Departments within Msunduzi Municipality
- Department of Agriculture and Environmental Affairs
- Wildlands Conservation Trust
- **Msunduzi Catchment Management Forum**
- DUCT
- Umgeni Water
- Eco-Furniture
- WESSA Eco-Schools and WESSA Share-net
- Faith Groups.
- Community Based Organizations
- Commerce and Industry
- Pietermaritzburg Chamber of Business (PCB)
- UKZN and the Google Earth Website
- GroundTruth Water, Wetlands and Environmental Engineers and The MiniSASS website



The project area of the Baynespruit is approximately 9 km in length. Starting in the north at Otto's Bluff Road (29°32'26.9"S 30°23'35.9"E) which is situated in the residential area of Northdale and flowing in a south easterly direction through the Willowton industrial area and Sobantu residential area where it joins the Duzi River (29°35'36.121"S 30°26'0.553"E)

- The Baynespruit is one of the most highly polluted rivers within the region and is currently consistently ranked in the top six most polluted rivers in South Africa. The river has also been a 'hot topic' in the local media with regards to its poor ecological health and its associated impacts on local communities and the environment. The Baynespruit is also a regular discussion point on the Msunduzi Catchment Management Forum agenda.
- *E.coli* levels in the Baynespruit reached **141 400 *E.coli* per 100ml** in January 2012. Results over 10 000 per 100ml indicate high incidences of sewage contamination.
- Due to the high pollutant loads introduced into the Umgeni system by the Baynespruit, interventions which would result in even low to moderate improvements in the water quality of the Baynespruit is likely to contribute significantly to improvements in the overall water quality of the Umgeni catchment.

Council Resolutions; Resolved (26 February 2014) that:

- a. That the identification of the Baynespruit Catchment as an appropriate site for the rehabilitation and installation of appropriate ecological infrastructure in accordance with the UEIP MoU and the Full Council resolution dated 30 October 2013 be noted
- b. That the Manager: Environmental Management Unit in consultation with the Process Manager: Water and Sanitation and Process Manager: Area Based Management, engage firstly with the relevant ward councillors to develop and implement consultative processes forums and that through collaboration with all interested and affected role-players, design and develop projects for the rehabilitation and installation of relevant ecological infrastructure.
- c. That any projects which may have legal or financial implications for Council be reported in detail for information and a decision.

Progress to date: A meeting was held with the **four relevant ward councillors**; ward 28, ward 30, ward 31 and ward 35 and necessary departments on the 10th April 2014. The ward councillors fully supported the initiative and agreed to contribute to and participate in the project). Preparation of a report to SMC to request authority to proceed with consultation within relevant communities. The ICT unit has been requested to upload all the relevant background information on the municipal website. Authority was also requested to fully brief Ms. Thobeka Mafumbatha, the Manager: Marketing and Communications, with a view to preparing media releases as required and a PowerPoint presentation on progress in the Baynespruit uMgeni ecological infrastructure partnership be made to the economic development portfolio committee).

- A Background Information Document has been prepared
  - Has been circulated within the Msunduzi Catchment Management Forum and KZN Wetland Forum
  - And is available on Msunduzi Municipality's Website

Aim and Objectives of the Project

Aim: To rehabilitate ecological infrastructure of the Baynespruit stream which will result in improved quality of water entering the Msunduzi River which the Sobantu community may utilise for recreational activities, fishing and irrigation of their agricultural lands.

Objectives:

- To identify and map the Key constraints and opportunities along the length of the Baynespruit stream in order to identify mitigation strategies, develop action plans and projects and to suggest best practice with regards to proposed development strategies.
- To conduct water quality sampling along the Baynespruit stream at fixed locations and compare trends against historic data which will be used to locate problem areas.
- **To determine wetland condition and functionality by undertaking a wetland health and ecosystem services assessments in order to determine water quality constraints, identify opportunities in the provision of water services and develop rehabilitation plans.**
- **To conduct MiniSASS assessments along various reaches of the Baynespruit Stream to determine water quality and the health of the riverine system.**
- To identify key role players in communities through field work and assist in developing mitigation strategies, plans and programmes with them.
- To identify and mobilise local schools within the communities alongside the Baynespruit stream to conduct MiniSASS assessments to promote the ongoing monitoring of water quality and to encourage custodianship of the environment through education and awareness
- **To remove and monitor Alien Invasive Species identified within the Catchment.**
- To develop and construct storm water management controls through ecological infrastructure such as the creation of floating wetlands.
- **To reduce erosion and sediment build-up by stabilising river embankments by means of planting Riparian forests and Vetiver grass as well as possible gabion structures.**

Majority of land surrounding the project area is privately owned with General Industry and Residential being the main zonings. Municipal owned land zoned as Active Public Open Space is largely located along the riparian areas and towards the east. Therefore the areas where potential ecological infrastructure interventions could take place are owned by the Msunduzi Municipality resulting in easier access to land and a more rapid implementation response.

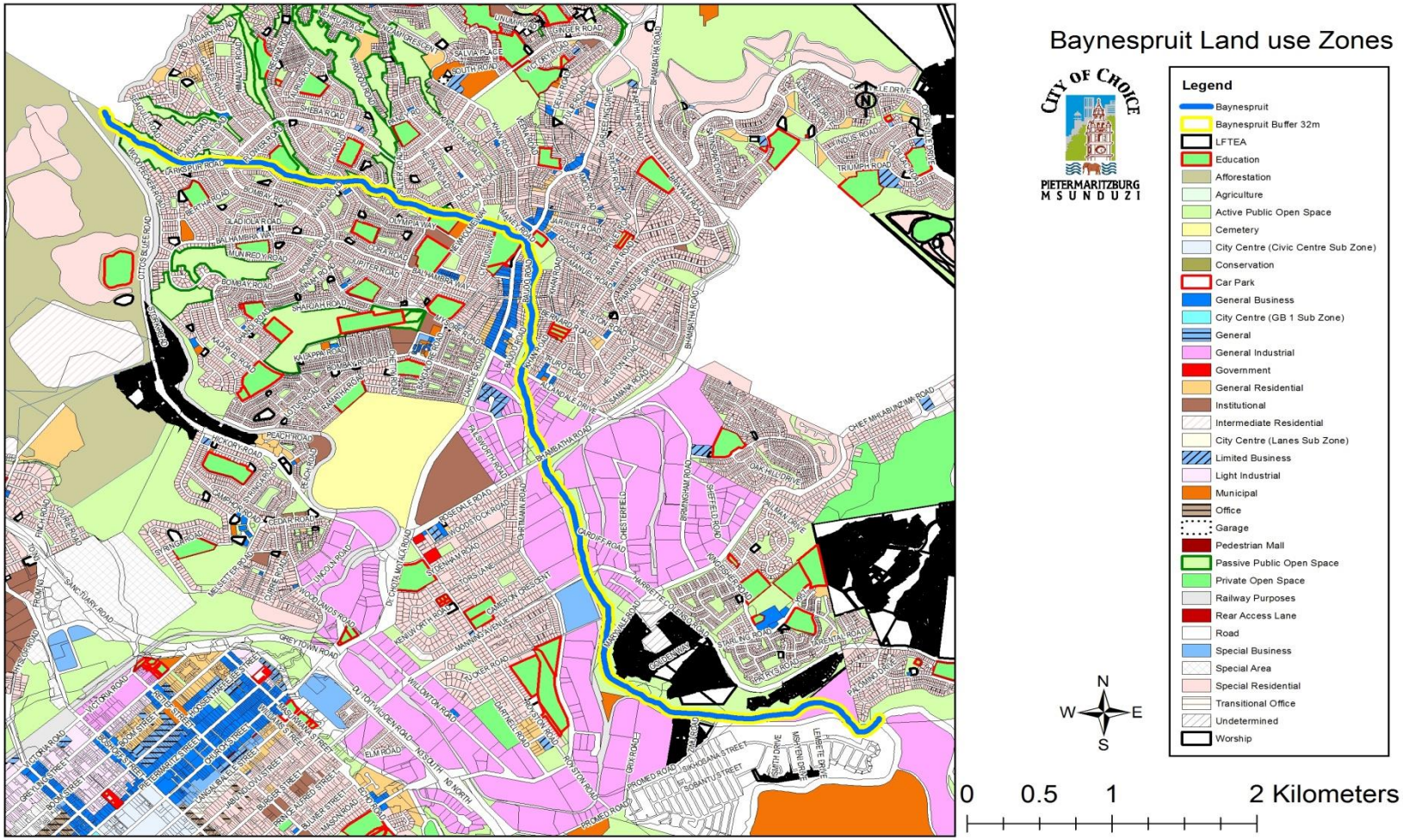


Table 1: Combined Attributes of Location and Extent of the Problem along the Baynespruit Stream

Causes of the Problems	Nature and Severity of Impacts created from the Problems	Strategies to Address the Problem
➢Incorrect methods of solid waste disposal combined with old infrastructure.	❖Impact on storm water infrastructure. ❖Decline in water quality and river health in the Msunduzi.	✓Sewer maintenance at 5 'Hot Spot' areas: Commencement of sewer infrastructure upgrades at Baijoo and New Greytown Roads. ✓ Blockages in drainage systems can be cleaned on a regular schedule ✓Floating wetlands for enhanced stormwater treatment
➢The lack of or inadequate sewage infrastructure ➢Maintenance of sewage infrastructure ➢poor operation of waste water treatment works.	❖Highly contaminated water with high levels of *E.coli* ❖Increase in the level of nitrification causing algae blooms ❖Negatively impact ecosystem functioning.	
➢Ingress of storm water into sewerage systems	❖Surcharging sewer lines and over loading of the Darvill Waste Water Treatment Works	
➢The transformation of riparian areas. ➢The transformation of wetland areas ➢Wetlands being drained	❖Impacts on catchment hydrology, water quality, biodiversity and flood regimes. ❖Reduction in riverine health ❖Inability of wetlands to act as Ecological Infrastructure and provide ecosystem goods and services.	✓Removal of solid waste and litter ✓Clearing and monitoring of invasive alien species ✓The replacement of alien species with indigenous vegetation ✓River embankment stabilisation by means of a combination of Vetiver grass, riparian forests and gabion structures.
➢Industrial pollution in riparian zones ➢ illegal dumping of waste.	❖Affects the suitability of habitat for a range of flora and fauna.	
➢Alien plant species encroachment and infestation ➢Increased nutrient loads and Erosion ➢Disturbance in the ecosystem	❖Rapid encroachment of Invasive Alien Species ❖Loss of biodiversity and species diversity through competition and succession. ❖Affects the production of Ecosystems Goods and Services	

Continuation of Table 1: Combined Attributes of Location and Extent of the Problem along the Baynespruit Stream

➢Illegal discharges of effluent from industrial sources	❖Water quality is negatively affected ❖Ecosystem integrity and human health are threatened.	✓ Create awareness about wetlands and riparian areas ✓Find alternative methods for industries to dispose of industrial waste or repurpose the waste for re-use or recycling ✓Floating wetlands also reduce chemicals such as copper, zinc and fine particulates
➢Urbanisation and other developments	❖Increases the amount of hardened surfaces within the catchment ❖Increases storm water runoff which enables the excessive increase of erosion	✓ Rehabilitate wetland and riparian areas through off set and mitigation projects ✓ Develop a Storm Water Management Policy ✓ Ensure Storm water attenuation facilities are implemented for new developments.

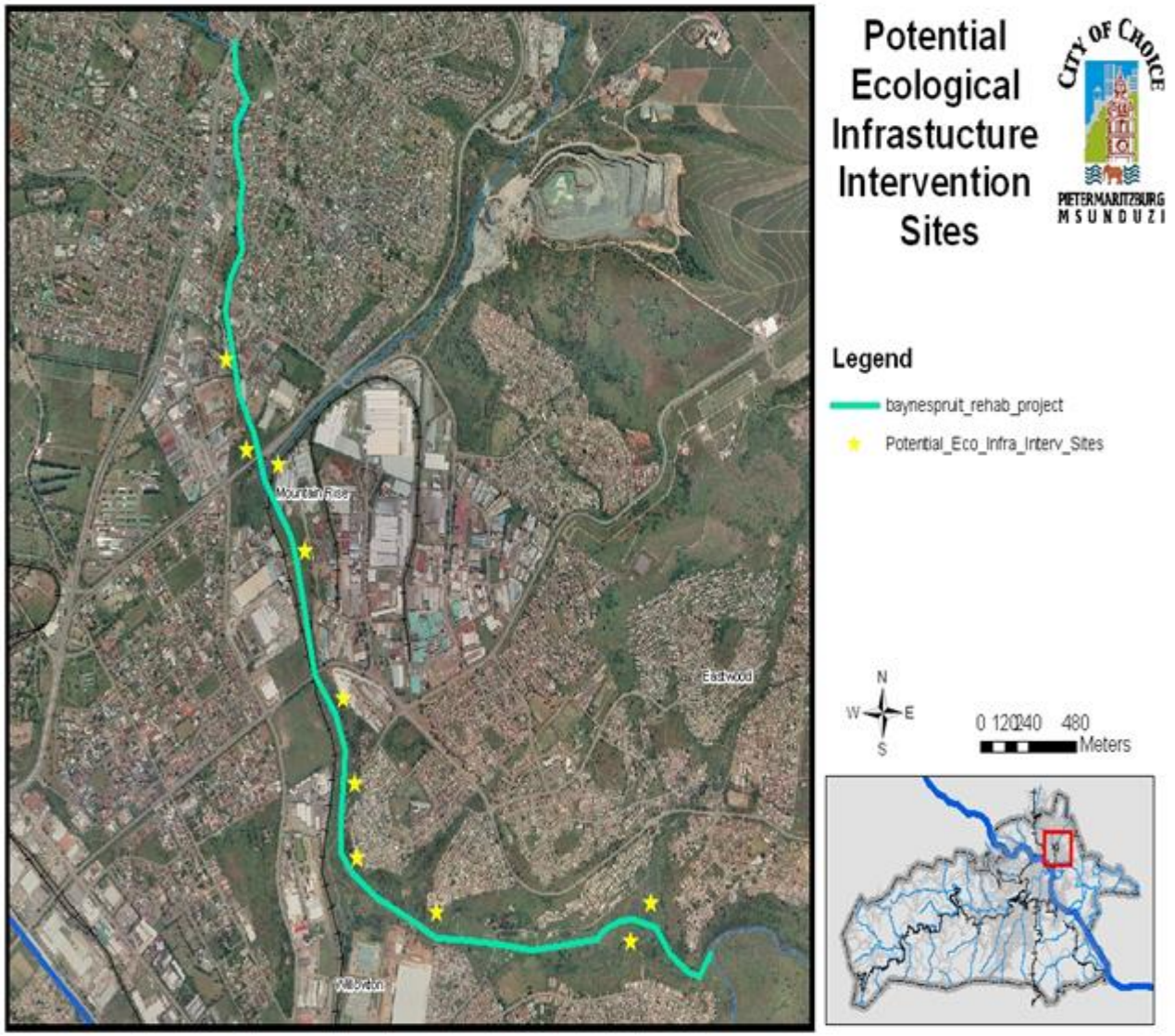
Nature and severity of the impact (Social and Economic)

Causes of the Social Problems	Nature and Severity of Impacts created from the Problems	Strategies to Address the Problem
Health	Decrease in quality of Life	✓ Public awareness and Education ✓ Information Campaigns
Impacts on the Duzi Canoe Marathon	Recreational Function of the Duzi Lost	✓ Community / Environmental Champions ✓ Waste minimisation Clubs ✓ River Clean up
Highly polluted and contaminated water	Sobantu community cannot irrigate agriculture	✓Rehabilitate Ecological Infrastructure to improve water quality ✓ miniSASS with Schools
Causes of the Economic Problems	**Nature and Severity of Impacts created from the Problems**	**Strategies to Address the Problem**
Risk to the Duzi Canoe Marathon	❖ Loss in sponsorship ❖ Decrease investment in the city	✓ Re-align existing resources with Department of Agriculture for Funding ✓ International and Local Industries Funding
Increase cost of cleaning water for potable use	Decrease in availability of Ecosystems goods and services for those dependent on them	✓ Job creation is key for granting funding
Lack of funds for upgrades	Inability to conduct maintenance and upgrade infrastructure	✓ Develop a plan with Budget of expecting costs and a proposal on how money can be spend ✓ Funding opportunities

Potential Ecological Infrastructure interventions that could help to address this problem

Identify and Rehabilitate existing areas that provide ecological infrastructure such as wetlands, riparian forests and grasslands

Create new **ecological infrastructure** i.e. wetlands, re-vegetation of stream banks, erosion control and stabilisation and establishment of new riparian forests.



Complementary initiatives (built infrastructure, other ecological infrastructure initiatives) in the same area that are proposed or underway, with which this proposed project could link

- The Msunduzi Municipalities Water and Sanitation Unit has currently;
- Appointed Aurecon to commence with phase 1 of the project which involves:
- Relaying of a 150mm diameter sewer across a culvert on Baijoo road;
- Baijoo Road – Repairs to broken 150mm diameter sewer crossing at stormwater outfall and bank erosion protection (29°34'0.93"S 30°24'31.80"E).

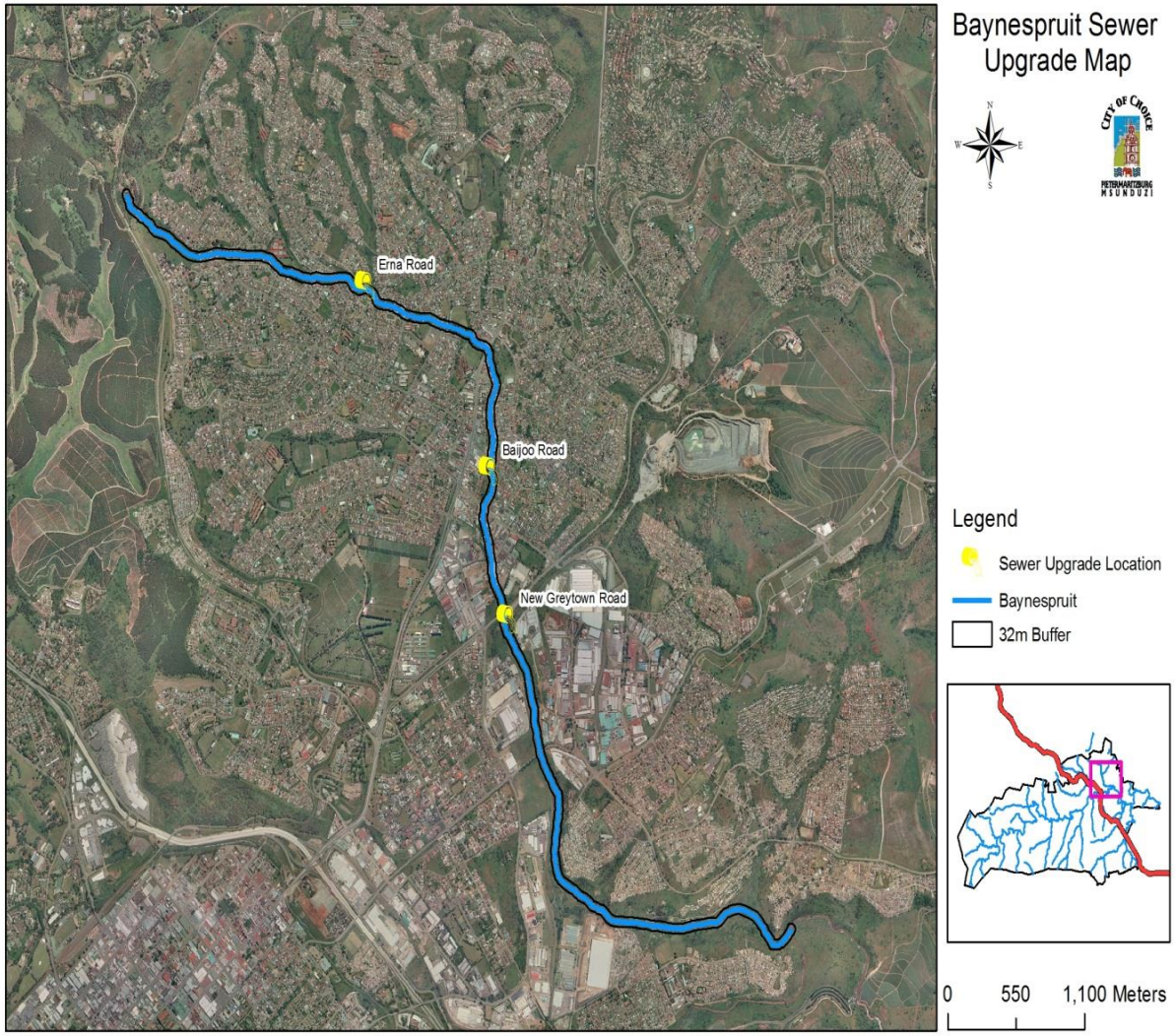
BAIJOO ROAD HAS COMMENCED BUT NOT COMPLETED

- **Erna Road** which was later identified and added to the Hotspots has Commenced with upgrades as a matter of urgent attention.

ERNA ROAD HAS COMMENCED BUT NOT COMPLETED

- Repairs to sewer stream crossing near New Greytown road.
- New Greytown Road sewer stream crossing – stream bank erosion rehabilitation and protection of sewer pipe through stream (29°34'30.92"S 30°24'36.11"E).

NEW GREYTOWN ROAD STILL TO COMMENCE



Faith Based Organizations

JMR Ministries

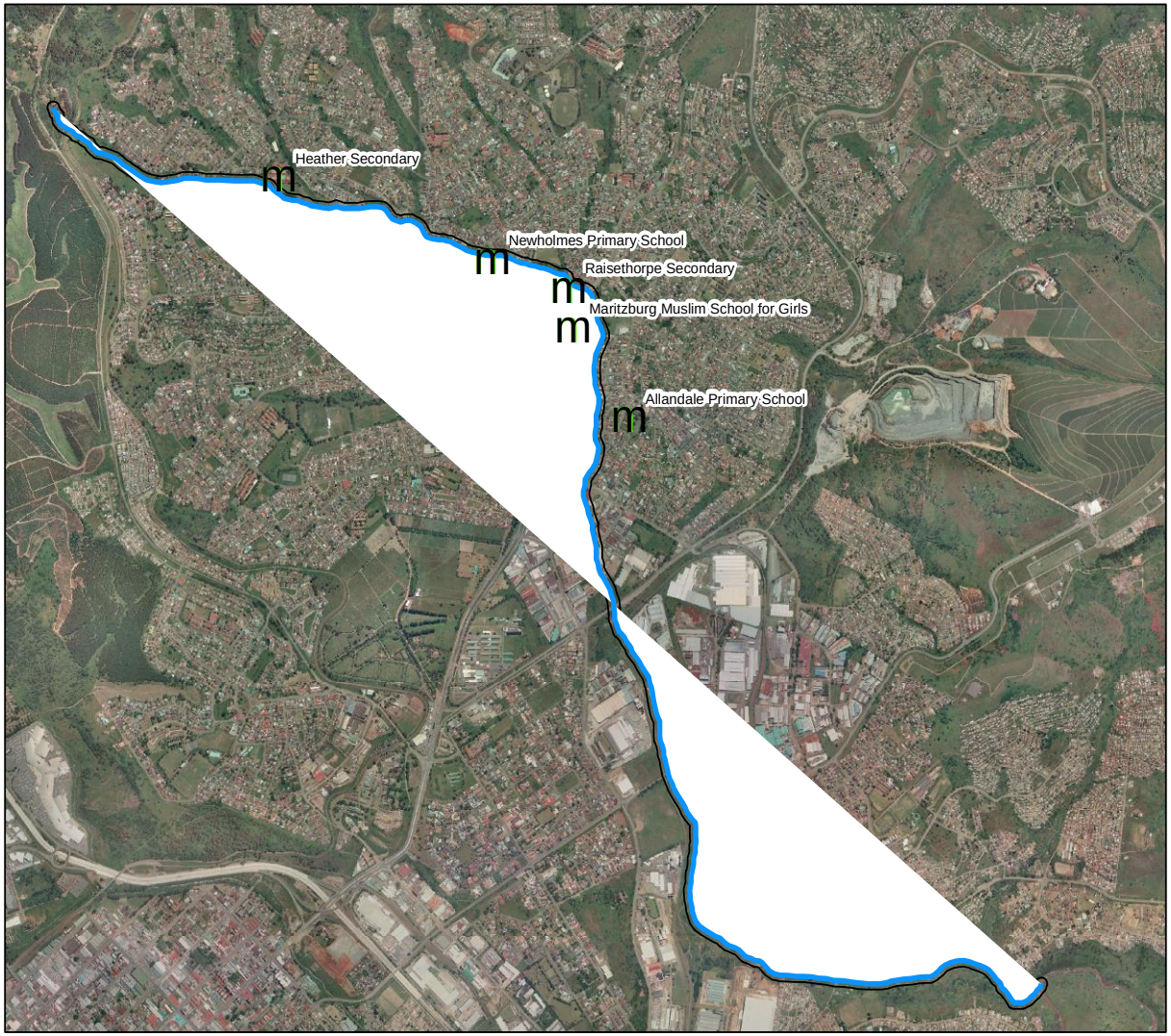
- There are currently people who maintain the stream by removing litter

- Interest was expressed with regards to MiniSASS assessments, alien plant clearing and river clean up initiatives.
- The Church already recycles and will encourage their congregation to do so to support their local schools
- There is potential for the Church to ‘Adopt a Spot’

Faith Based Organizations

- JMR Ministries – A Community MiniSASS Training Event was held
- Trainers for the Event were Honour's and Master's students from UKZN all working with MiniSASS for their Academic Projects.
- Results improved since the first MiniSASS assessment (16th July 2014) from being critically modified (purple crab) to being moderately modified (fair condition yellow crab)

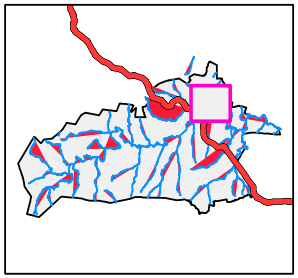
Project 14: Local Schools along the Baynespruit to 'Adopt a Spot'



Baynespruit schools map

Legend

- Baynespruit_schools
- Baynespruit
- 32m Buffer



0 475 950 Meters

Local Schools have been identified along the Baynespruit stream and to date most are fully supportive of the project. Their role will be to monitor water quality by means of the miniSASS tool which will be incorporated into the CAPS curriculum, adopt a spot approach and other recycling initiatives.

Educational Materials

- PROVIDED BY:
    1. Msunduzi Municipality
    2. DUCT (Duzi Umgeni Conservation Trust)
    3. eThekwini Municipality
    4. GroundTruth Water, Wetlands and Environmental Engineers

- CONTENTS:

1. Invasive Alien Plants Charts
2. Herbs and Grasses Charts
3. Aquatics, Climbers and Reeds Charts
4. Emerging Species Charts
5. Wetland Poster
5. Rivers Poster
6. Indigenous Trees and Shrubs List
7. Common Environmental Terms booklet
8. MiniSASS Poster and Pamphlet
9. MiniSASS Lesson Plans and Activities (CD)
10. MiniSASS Field Work booklets
11. MiniSASS methods pamphlet and Dichotomous Key
12. Community River Health Assessment Guideline Video (DVD)

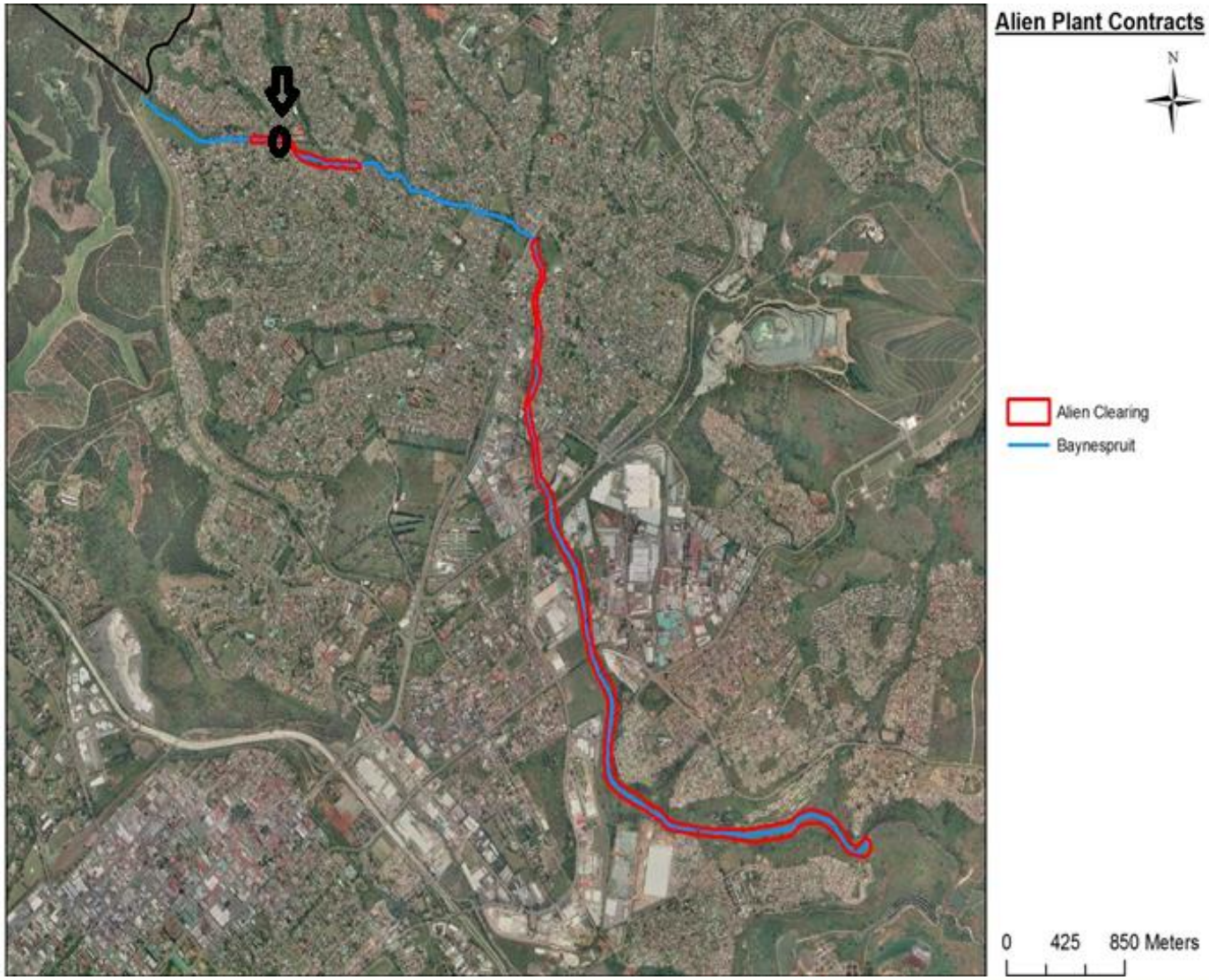
Project 10: Alien Plant Removal

We have 1 **Municipal team** of 10 people for 10 days to clear alien vegetation along the Baynespruit. Work to occur in Sobantu.

Extended Public Works Programme

- The **Extended Public Works Programme** has obtained contracts along areas along the Baynespruit. There are two contracts with the 1st being 18 days followed by the 2nd contract of 12 days.

Alien plant control Areas



List of Species cleared:

Bugweed
Castor oil plant
Black wattle
Mauritius Thorn
Lantana
Mexican sunflower

Project 12: Planting of Indigenous Plants

- 44 of 60 Trees were planted along the Baynespruit with 20 planted in Sobantu, 10 along JMR Church, 9 at Heather Secondary School and 5 at Newholmes Primary School.
- The remaining 16 trees have since been planted 8 each at Newholmes primary and Raisethorpe Secondary schools along the Baynespruit respectively.
- 75 more trees have been ordered and 15 of these have been planted at JMR Church.

AS A RESULT OF THE INITIATIVES UNDERTAKEN, IMPROVEMENT HAS BEEN SEEN IN TERMS OF AQUATIC AND TERRESTRIAL BIODIVERSITY.

Thank You!

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