July 2024

Amphibian Report for Erf 438, Stanford prepared for Lornay Environmental Consulting

1. Introduction and methodology

This report is informed by historic frog records extracted from the Virtual Museum of the Animal Demographic Unit, UCT (given in Figure 1) and two site visits done on Wednesday, 24 July 2024 at 12:30 and 26 July at 18:30. Frog calls were thus monitored during the day as well as after dark.

Frog monitoring is mostly done at night when the breeding males are calling. Monitoring should ideally be done over an entire year to be reasonably sure that all the frog species present on the site are captured in the monitoring data. If this is not possible, other sources must be relied on, such as historic data and previous experience of the general area of the site under investigation.

In this situation of a very limited observation period and in the current context of changing weather conditions often manifested in extreme weather events, the historical record is extremely important.

FrogMAP — Frog Atlas of Southern Africa

12 species found for locus = 3419C
Date filter: none

#	Species code	Family	Scientific name	Common name	Red list category	Number of QDSs	Number of records	Last recorded
1	150	Brevicipitidae	Breviceps acutirostris	Strawberry Rain Frog	Least Concern	1	2	2020-11-19
2	210	Brevicipitidae	Breviceps montanus	Cape Mountain Rain Frog	Least Concern	1	1	1998-09-20
3	370	Bufonidae	Sclerophrys capensis	Raucous Toad	Least Concern	1	3	2003-01-17
4	345	Bufonidae	Sclerophrys pantherina	Panther Toad	Endangered	1	4	2001-07-18
5	290	Bufonidae	Vandijkophrynus angusticeps	Sand Toad	Least Concern	1	5	2001-07-18
6	580	Hyperoliidae	Hyperolius horstockii	Arum Lily Frog	Least Concern	1	3	2018-04-09
7	920	Hyperoliidae	Semnodactylus wealii	Rattling Frog	Least Concern	1	2	1997-09-26
8	890	Pyxicephalidae	Amietia fuscigula	Cape River Frog	Least Concern (2017)	1	5	2022-08-20
9	120	Pyxicephalidae	Arthroleptella villiersi	Villiersdorp Moss Frog	Least Concern	1	2	1998-06-20
10	400	Pyxicephalidae	Cacosternum boettgeri	Common Caco	Least Concern (2013)	1	4	1998-09-20
11	950	Pyxicephalidae	Strongylopus grayii	Clicking Stream Frog	Least Concern	1	5	2021-04-16
12	1000	Pyxicephalidae	Tomopterna delalandii	Cape Sand Frog	Least Concern (IUCN 2013)	1	1	1997-09-26
	Total					**12**	**37**	**2001-07-18* 1998-09-20****

***Figure 1*: Record of Toad and Frog species in study area**

Although I have not monitored frogs specifically on Erf 438 before, I have done a number of years of frog monitoring in the town itself and in the environs of the Mill Stream. This has included following the breeding season of the (endangered) Western Leopard Toads of Stanford. Over the past three years I have distinguished two definite periods of calling for this species in the Stanford area; one in mid-July and another at the end of August.

The list of historic frog records given in Figure 1 covers an area larger than (but including) Erf 438. Some on this list are found at higher altitudes in mountainous habitats and thus cannot be expected to occupy the lowland area of Erf 438 This assumption applies to the Strawberry Rain Frog (*Breviceps acutirostrise*) and Cape Mountain Rain Frog (*Breviceps montanus*). I have also not detected a Rattling Frog (*Semnodactylus wealii*) call in Stanford to date and would not expect it to be present on the site. Moss frogs generally occupy heavily vegetated, perennially wet seepage areas with minimal degradation, which does not describe Erf 438.

2. Frog and Toad species probably on site

If the above are excluded from the historic list, the following species could be expected to be present on Erf 438.

1. Raucous Toads
2. Leopard Toads
3. Sand Toads
4. Arum lily Frogs
5. Cape River Frog
6. Common Caco
7. Clicking Stream Frog
8. Cape Sand Frog

A number of these breed at different times of the year and thus would not be calling now. Although they may well be present on the site,

they would not be heard and could therefore easily be missed. Figure 2 notes these species, comments on their probable presence and gives pointers to accommodating them on site.

Scientific name	Common Name	Observations	Comment
Sclerophrys capensis	Raucous Toad	These toads are very common in the area and resilient to disturbance, so are highly likely to be present even though they	These toads increase around human habitations and because of their loud calls, can become a nuisance. They call from October to February. These

		were not detected during the field visits.	toads are good indicators of ecosystem health.
Sclerophrys pantherina	Leopard Toad	It is possible that they use the excavated pool in the Mill Stream for breeding, but were neither heard nor seen during the field visits.	This endangered species can and should be encouraged to occupy this site by a number of ways detailed below.
Vandijkophrynus angusticeps	Sand Toad	Uncommon but possible.	
Hyperollus horstockii	Arum lily Frog	These frogs are present in other parts of the Mill Stream catchment, but were not detected during the field visits.	If beds of arum lilies are planted in the riparian area of the Mill Stream there is a good possibility that these frogs will spread to this site.
Amietia fuscigula	Cape River Frog	Highly likely to be present but were not detected during the field visits.	These frogs are common in garden ponds. Residents should only build ponds if they (and their neighbours) can cope with raucous toads and Cape River Frogs calling all night.

***Figure 2*: Frog species likely to be present on Erf 438 Stanford**

3. Observations on site

3.1 During the daytime site visit I detected Common Caco and Clicking Stream Frogs calling. During my nighttime site visit I detected over 200 calling males of the Common Caco frogs, over 100 calling males of the Clicking Stream Frogs, and one Cape Sand Frog calling. These were detected in the area marked in yellow on the aerial photograph of the site (Figure 3).

3.2 Most of the frogs were found in the northernmost area on municipal land currently leased to a roll-on grass operation, and in the riparian area of the Mill Stream in the south. The agricultural area between these areas showed high levels of ecological disturbance and was unoccupied by frogs, most likely due to the application of pesticides and fertilizer. As noted in the Aquatic Biodiversity Impact Assessment, soil has been brought into this area and compacted. Although I did not test water quality, I observed many instances of algae growth in the standing water in the central agriculturally active area, which would indicate that the water is nutrient enriched.

***Figure 3*: Aerial photograph of Erf 438**

3.4 Although the vegetation in the northern area appears ideal for chameleons, we did not find any during our night survey of the area.

3.5 There is invasive grass growing everywhere on the site. This grass is outcompeting the natural vegetation in the north, encroaching into the tributary wetland in the southeast area and, is also prominent in the Milkwood Forest. Grass invasion generally in a milkwood forest is accompanied by dieback of the trees.

3.6 The Milkwood Forest is a jewel on this property, and I support Bernard Oberholzer's recommendations regarding its protection and preservation.

3.7 I observed nesting Spotted Eagle Owls in one of the Milkwood trees (close to the prickly pears, which I recommend removing) which were disturbed by my movement through the forest. If this breeding site is to be preserved (and it should be), then it should ideally be cordoned off from humans as part of the site design. According to Stanford Bird Club, there are two breeding pairs of Spotted Eagle Owls (mottled brown) on the site and Sparrow Hawks (black with white fronts) are regularly seen flying over the area.

3.8 There are several alien and invasive plant species (including gum trees) growing on the site that must be removed.

3.9 Water use for the roll-on lawn area would appear to be having a marked impact on the natural water systems on site. There is a water pump next to the Mill Stream, presumably used to pump water to irrigate the roll-on lawn area during the dry season. There should be a Water User's License for this; if so, the conditions of use should be checked. There is also a drainage canal draining water from the roll-on lawn cultivation area through the hillslope seep wetland area, and eventually discharging enriched water into the Mill Stream.

4. Mitigation measures to enhance amphibian conservation on Erf 438

4.1 In the Western Cape the water is naturally slightly acidic, and the soils are generally infertile. When this is changed through agricultural application of fertilizer, the pH of the water increases and the chemical composition changes too, which drives all but the most resilient frogs from the area. This is why one must not only consider whether frogs are present but also the abundance of those species that are present. Typically, in the Overstrand highly disturbed areas with chemically enriched water will support large numbers of Raucous Toads and Painted Reed Frogs as these species can tolerate these adverse conditions. The numbers of the more sensitive frog species dwindle and often these frogs disappear altogether.

In general, a healthy aquatic ecosystem should have smaller numbers of each species but a greater number of different species of frogs present. This should be the conservation or management goal of any strategy to improve the wetland health on a site. This is possible even in a development estate such as Stanford Green. I would recommend the following measures which align to the recommendations proposed in other reports and assessments for this development.

4.2 Get rid of as much of the invasive grass present on the property as possible. Grass should be limited to only what is necessary and restricted to indigenous local species.

As far as possible grass should be replaced with fynbos vegetation, particularly on road verges (such as ground covers like *Arctotis* and *Gazania* species) to provide safe corridors for frogs and other animals to move through. The journey for tiny toadlets on their first emergence from their breeding ponds to their foraging grounds is extremely arduous. Many of them die while crossing roads and other hard surfaces without protection from the sun. Shelter plants protect them from the elements and from predators.

4.3 Road verges should be U-shaped without any edge. The 50mm edge along De Bruyn Street in Stanford North was a death trap to emerging Western Leopard toadlets coming out of the breeding pond there and crossing to their foraging grounds. This occurs approximately 10 weeks after breeding when the toadlets emerge from mid-October to early December (see Figure 4).

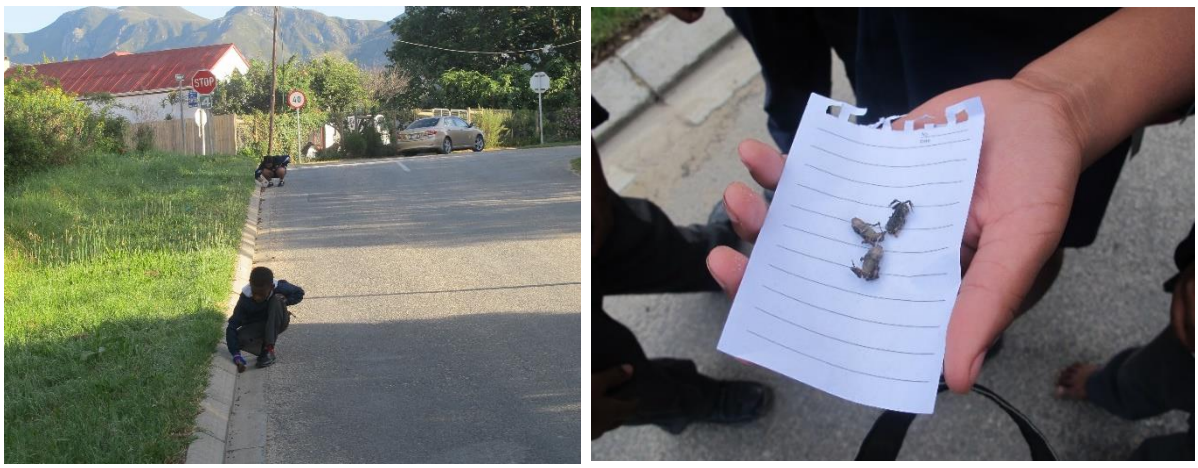

Figure 4: **Dead toadlets along the road verge. [Source: S van Wyk, 2015]**

To address this problem, Whale Coast Conservation (WCC) filled the spaces in the verge stones along De Bruyn Street, Stanford, to create a shallow V-shape (see Figure 5). We have not found any dead toadlets in these verges for the last three years

Figure 5: **Filling the sharp edge of the verge stones to assist the safe passage of toadlets to their foraging grounds. [Source: Whale Coast Conservation Facebook Page, 8 December 2021]**

4.4 Most frogs are not fully aquatic; they spend most of their lives in their foraging grounds and only return to their breeding ponds once a year to spawn. For the rest of the year, they will be in gardens, fields and forests, generally in moist, shady areas foraging for food. To encourage their presence on the estate, the vegetation in gardens must be as "wild" as possible and preferably landscaped with indigenous plants. Wood piles, compost heaps and leaf litter provide food and hiding places for these creatures.

4.5 A "No pesticides" rule must be non-negotiable.

4.6 Garden ponds should be discouraged as they tend to attract the noisy frogs during the breeding season

4.7 All frogs, other than the aquatic Platannas which can breathe in water, will drown in a pool or pond if they are trapped there for too long treading water. Pools and ponds must have a means of escape for a frog. There are various ways this can be achieved using rock piles, frog ladders and toad savers or using "walk-in" pool designs.

4.8 Chlorinated water will kill frogs and will pollute the surrounding natural water bodies when the water is drained. No chlorine should be used on the estate at all.

4.9 Numerous small corridors between houses should be accommodated in the hillslope wetland to allow both for the free movement of the frogs and natural drainage of water. The Mill Stream is classified as a floodplain wetland or an unchanneled valley bottom wetland and presents an opportunity to create a visually pleasing river front area.

4.10 The aquatic report mentions that the open water pool upstream from the R43 has been artificially excavated, presumably to make a farm dam to divert and store water (Van Zyl & Morton, 2024, p25). It should be noted that South Africa's environmental laws prohibit these activities, and that if there is no Water User's License water extraction should stop. The report also states that there is regular reed cutting. However, I have never seen nor heard of any reed cutting in this area during the five years that I have been doing reed cutting in different areas on the Mill Stream.

4.11 Regular reed cutting should take place. Cutting reeds improves the water quality; pruned reeds absorb excess nitrates and phosphates from the water as they regrow. WCC's water testing in the past has identified very high levels of these chemical compounds in the stormwater discharging into the Mill Stream on the bank opposite Erf 438. In addition, in the areas where WCC has cut reed, we have found that this activity promotes an increase in biodiversity and broadens faunal habitat use. We have noticed more wading birds and insects in the open areas as they gain access to a food source previously obscured by congested reed growth.

4.12 Reed cutting should only occur in the hot and dry months from December to May. Note that environmental law prohibits the dredging of more than 300 square meters of reed from a riverbank or riparian zone as this destabilises the substrate. Reeds or reed rhizomes should not be removed as reeds are highly efficient at reducing water pollution provided, they are regularly cut during the dry season, preferably when the water volume is at its lowest at the end of autumn. An early December cut and a repeat cut in May is recommended. All cut

material must be removed immediately lest the nutrients in the cut reed biomass leach back into the water. (WCC shreds the reed biomass and includes it in a compost mix.)

4.13 WCC is collaborating with Guillaume Nel Environmental Consultants on the rehabilitation of the area disturbed by R43 road construction through Stanford. The multiple large culverts installed in the new R43 bridge construction facilitate connection between the eastern and western arms of the Mill Stream and allow for a safer, easier passage for fauna between these. On either side of this bridge, we will be experimenting with ways to suppress reed growth and will be planting lower-growing indigenous wetland plants to facilitate faunal movement. We anticipate that this will encourage faunal population as the ecological use of the ecosystem is improved. This will support the intention to make the area adjacent Erf 438 more nature orientated, expressed in *The Mill Stream Village Park and Greenway, Concept Master Plan* prepared on behalf of the Stanford Ward Committee Members for the Overstrand Municipality (Van Wyk, Bewsher, Bewsher & Oberholzer, 2018)

4.14 I agree with the recommendations made by Oberholzer (2024) for planted berms along the R43 and a 32m buffer along the Mill Stream as well as a swale suggested by Van Zyl and Morton for this buffer zone. This area should be planted with arum lilies to encourage the return of Arum Lily Frogs. Arum Lilies are also efficient filter plants for enriched water and anecdotal reports by long-standing residents refer to a profusion of arum lily plants in the Mill Stream catchment.

4.15 If these recommendations are implemented, I am confident that various species of frogs and toads will repopulate the site. Not only will they make an important contribution to the biodiversity of Erf 438, but they will also present an opportunity for the estate to showcase its efforts to restore the ecological processes of the site.

4.16 The resident frog and toad species hold potential as subjects for environmental tours or events, such as showcasing the Western Leopard Toad breeding season in the middle of winter – which is traditionally a quiet tourism time.

References

Oberholzer, B., (2024). *Environmental Site Analysis and Planning Indicators*. Bola. RSA.

Van Wyk, S., Bewsher, P., Bewsher, L., and Oberholzer, B., (2018). *The Mill Stream Village Park and Greenway, Stanford, Western Cape. Concept Master Plan*. Prepared for Overstrand Municipality.

Van Zyl, K., & Morton, R. (2024). *Aquatic Biodiversity Impact Assessment Erf 438 Standford* V1.0 Delta Ecology. RSA.