

CEPF Grantee Pest Management Plan

I. Grant Summary

1. Grantee organization.

WWF-SA. World Wide Fund for Nature-South Africa

2. Grant title.

Catchment Stewardship in Upper Umgeni Area: Biodiversity Stewardship and WWF's Water Balance Programme

3. GEM number (to be completed by CEPF).

59096 (Application Code)

4. Grant amount (US dollars).

US \$ 258,712

5. Proposed dates of grant.

30 months. May 2012 – 30 Dec 2014

6. Countries or territories where pesticides will be applied.

KwaZulu-Natal Province of South Africa

7. Full name, title, telephone numbers, and electronic mail address of Grantee personnel responsible for the pest management plan.

Susan Viljoen; Upper uMgeni Project Co-ordinator; 074 1140848; sviljoen@wwf.org.za

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8. Summary of the project.

By investing in dedicated capacity to drive these biodiversity stewardship and IAP clearing processes at a catchment scale, numerous benefits will be realised. The focus is on greater collaboration achieving greater wins:

- More land could be entered into biodiversity stewardship agreements with long term biodiversity and water benefits. Through these agreements, the likelihood that the underlying causes of the infestation by Invasive alien plants (IAPs) will be addressed in an effective manner is increased.
- WWF will be able to work with key water and IAP stakeholders in KZN to ensure alignment with their own programmes of IAP clearing.
- Engagements with water service providers, municipalities and the like may enable the option of a larger investment in ecological infrastructure within the Umgeni River Catchment (unlikely to be achieved within the time frame of this project but the collaboration/engagement with stakeholders would be vital ground work). WWF is currently playing a key role in the newly established Umgeni Ecological Infrastructure Partnership (UEIP).
- Closer management of the clearing activities.

- Responses to IAP infestations at catchment scale (i.e. a larger than farm boundary scale) will be better coordinated, with effectiveness and efficiency benefits.
- IAP clearing on individual landowner's property be better coordinated, as landowners committing to biodiversity outcomes will be funded the full costs of the initial clearing of these areas, again with effectiveness and efficiency benefits.

9. Date of preparation of the pest management plan.

Updated version: Sep 2013 (previous version before project initiation: Feb 2012)

II. Pest Management Approach

10. Current and anticipated pest problems relevant to the project.

IAPs pose a direct threat not only to South Africa's biological diversity, but also to water security, the ecological functioning of natural systems and the productive use of land. They intensify the impact of fires and floods and increase soil erosion. IAPs can divert enormous amounts of water from more productive uses.

11. Current and proposed pest management practices.

See attached WWF-SA Water Balance Herbicide Policy (Appendix A).

12. Relevant integrated pest management experience within the project area, country or region.

Within the Upper Umgeni catchment: Where an implementing agent/contractor is contracted to manage the clearing process, the employed agent shall have prior experience with herbicide use.

R&M Consultants has been contracted to undertake the clearing work at Umgeni Poort on Ivanhoe farm, and bring with them 14 years of IAP clearing. One of their largest previous contracts involved the removal of IAP's from 230km's of river frontage along the Lions River & Mpofana Rivers, on behalf of Umgeni Water. Their company also came recommended from landowners in the area and has a reputation of performing work of a very high quality.

The Lake Lyndhurst Lot Owners Association have been contracted to undertake the clearing work at Lake Lyndhurst. This association is responsible for the upkeep and maintenance of the Lake Lyndhurst properties including fire management and invasive weed control. The chairman Kobus Kruger has implemented a bramble eradication programme over the last 8 years and has successfully cleared and rehabilitated large, densely invaded areas on the property.

Furthermore, all WWF Water Balance contracts stipulate employed agents must follow the above mentioned WWF Herbicide policy guidelines (under question 11), which is based on the South African government's Department of Environmental Affairs Working for Water herbicide policy (Appendix B).

Within the country: The Water Balance Programme has five years of prior experience working with the above mentioned guidelines within other Water Balance nodes. All this work is aligned with the relevant regulations governing IAP clearing and the use and management of herbicides used in the process.

13. Assessment of proposed or current pest management approach and recommendations for adjustment where necessary.

WWF has worked with the relevant guidelines for the past four years and finds them satisfactory and in no need of adjustment.

In order to assess the appointed Contractor's familiarity and competence with implementing the WWF Herbicide policy, a herbicide compliance questionnaire was issued to R&M Consultants, appointed for the Umgeni Poort clearing. The questionnaire answers are available if required, and will be used as one of the components of the WWF Monitoring & Evaluation approach.

III. Pesticide Selection and Use

14. Description of present, proposed and/or envisaged pesticide use and assessment of whether such use is in line with best management practices.

No present herbicide use. Proposed herbicide use to prevent regrowth of cleared IAPs is vital, as relying solely on mechanical eradication methods is not as effective or quick. All herbicide application will be in line with regulated herbicide use, as per above-mentioned government guidelines and regulatory framework governing use of herbicides in SA (Appendix B).

15. Indication of type and quantity of pesticides envisaged to be financed by the project (in volume and dollar value) and/or assessment of increase in pesticide use resulting from the project.

The project is aiming to clear 104 ha of invasive plants over the 2.5 year project timeframe. The cost of the herbicides will be funded from project co-funding (supplied by private sector investment), not from the CEPF funds and is expected to cost approximately \$6210.

The first areas to be cleared total 53ha (uncondensed) and comprise 35.14ha condensed hectares (i.e. once IAP invasion density is accounted for). These areas have been mapped and the species and density of invasion has been calculated for each polygon/identified stand). From the mapping information, it has been calculated that the clearing work will require approx. 230 litres of herbicide as follows:

Herbicide / Product	Litres
Lumberjack	77.02
Garlon	32.59
Chopper	121.19
Wetter	76.26
Dye	15.25

Total herbicide:	230.8 litres
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(excl wetter & dye)

As further areas are identified for clearing, a similar process will be used to map the areas & IAP invasion, and then calculate the exact herbicide quantities required.

It is expected that the use of herbicides will be significantly reduced after the project has been completed, as the landowners are expected to maintain the catchments clear of IAPs through manual labour, mostly without the further need for herbicides.

16. Chemical, trade, and common name of pesticide to be used.

Trade and common name	Active ingredient	Dosage (litres/ha)	% Mix	Species	Treatment method
Lumberjack	Triclopyr (as amine salt) 360 g/L SL	Wattle & Bugweed: 6 ℓ/ha	Wattle: 3% Bugweed: 3%	Black & Silver Wattle; Cotoneaster; Bugweed	Cut Stump or Frill
Chopper	Imazapyr	Gum species: 10 ℓ/ha	5%	Saligna Gum	Cut Stump or Frill
Garlon	triclopyr (butoxy ethyl ester)	Black wattle: 0,75 ℓ/ha Bugweed: 1.5 Gum: 2.25ℓ/ha	Black wattle: 0.25% Bugweed: 0.5% Gum: 0.75%	All the above mentioned species (Wattle, Gum, Bugweed)	Foliar spray for follow-up treatments

17. Form in which pesticide will be used (e.g., pellet, spray).

Method of application is dependent on the clearing method used, and is as follows:

- **Cut-stump method:** This involves applying herbicide directly to the exposed cut surface of a felled stump, as there is a high probability that the stump will re-sprout if not treated. Herbicide application is done with either a backpack or hand-held sprayer (see figure below).
- **Frilling method:** Frilling involves applying a series of downward, angled cuts with an axe completely encircling the tree at knee height, leaving the partially severed bark and wood anchored at the bottom (see figure below). The herbicide is then sprayed or squirted with a hand-held or back-pack applicator until the cut/exposed surface is wet.

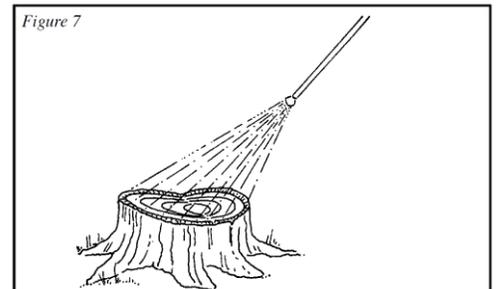
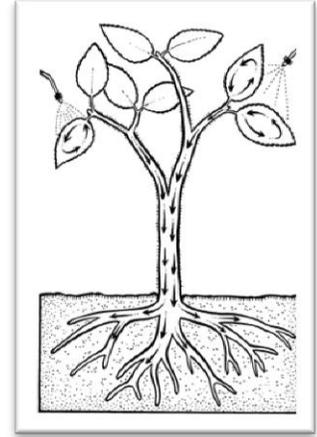
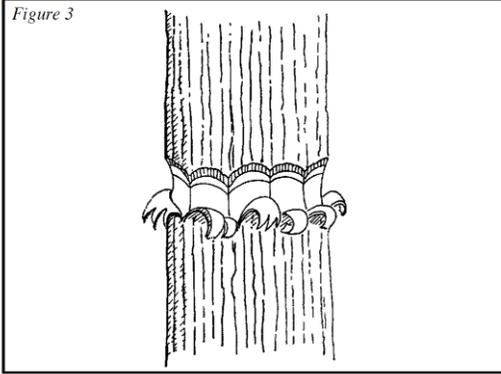


Figure 3



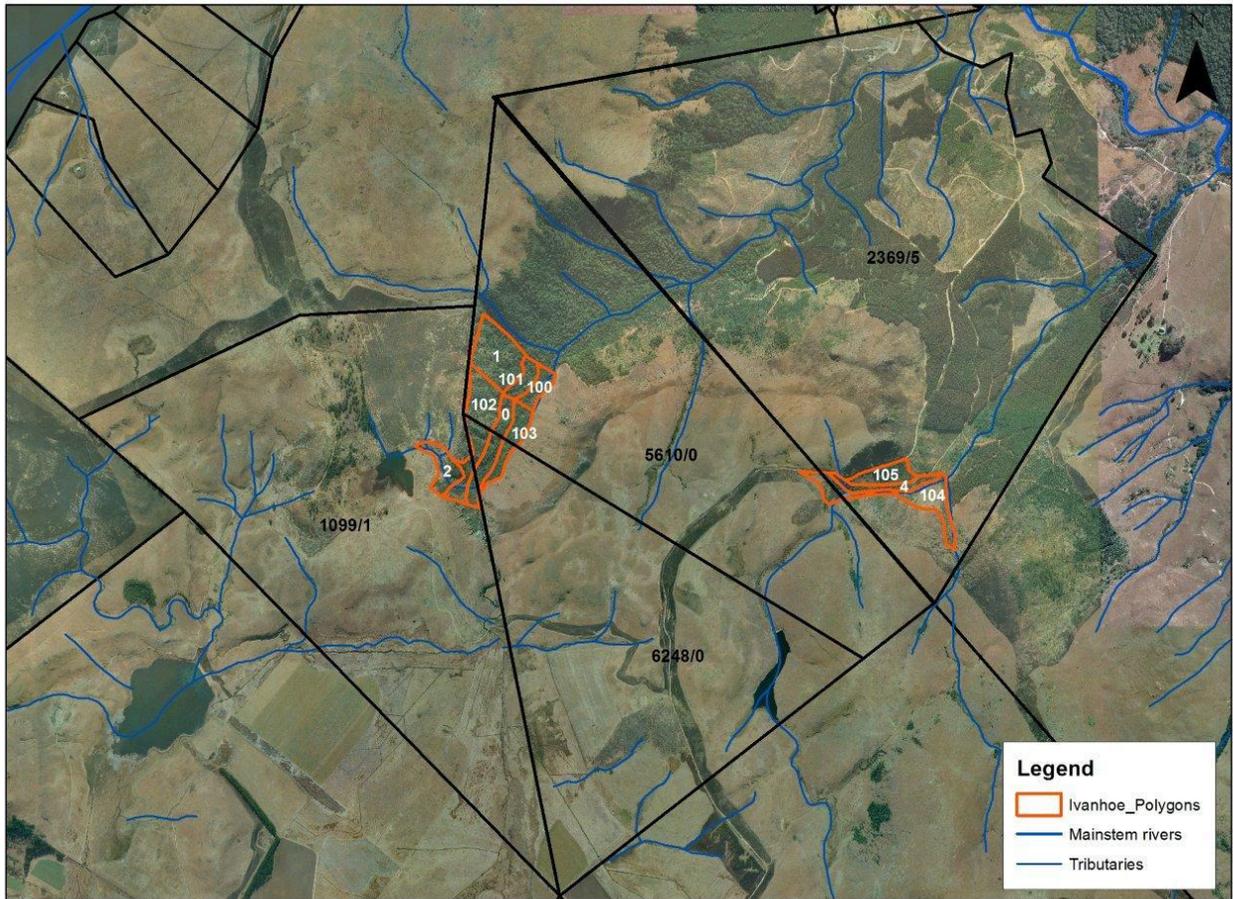
Foliar-spray method: This involves spraying herbicide directly onto foliage of individual plants at a volume that wets the foliage but not at the point of runoff. This method is only used for follow-up treatments to re-emerging young saplings and not used for treating mature/adult trees. A selective herbicide is used for this method, which will only affect the targeted species, and not any surrounding vegetation.

18. Specific geographic description of where the pesticide will be applied: name of province, district, municipality, land owners, or map coordinates (if available); and the total area (hectares) to which the pesticide will be applied.

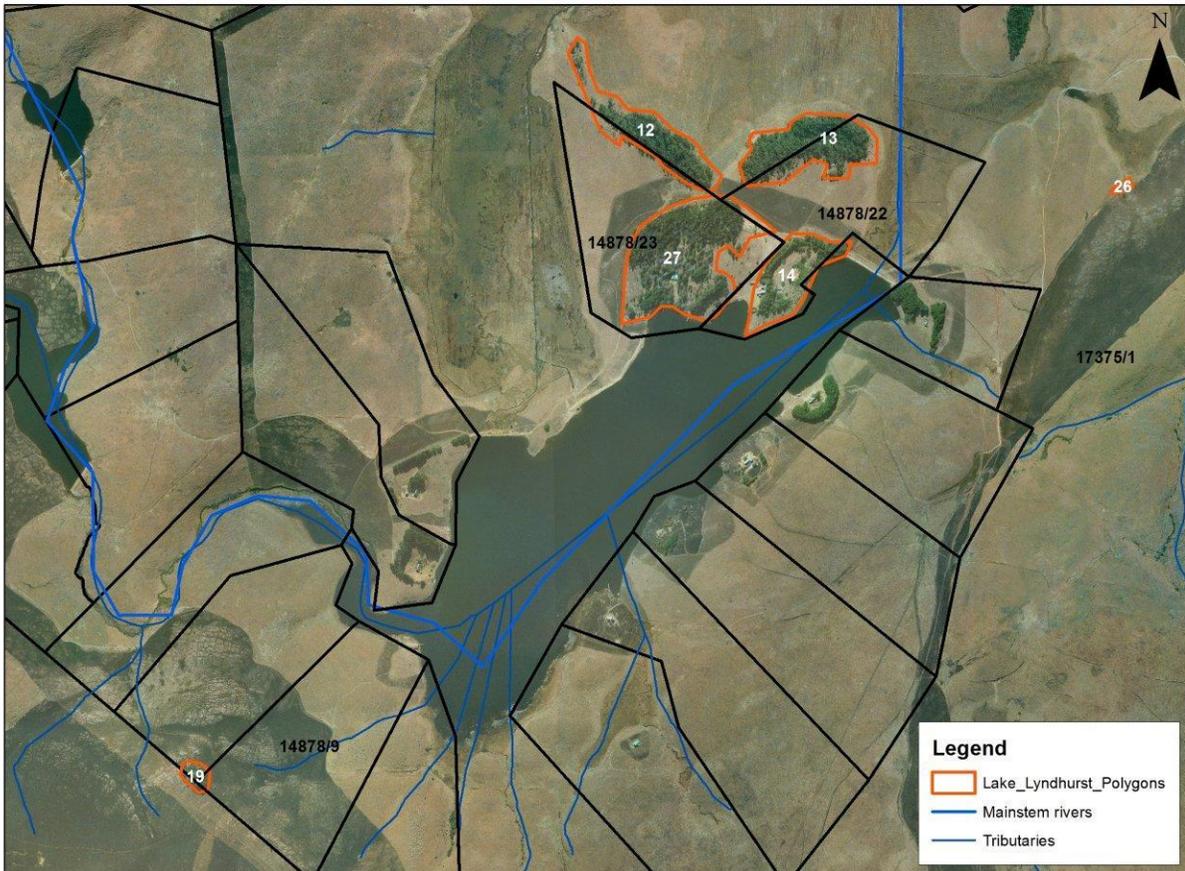
- Name of province: KwaZulu-Natal
- Municipality: Impendle Local Municipality within the uMgungundlovu District Municipality
- Land owners:
 - **Site (1), Umgeni Poort:** Ivanhoe Farming Company Pty Ltd – see Map 1 below
 - **Site (2), Lake Lyndhurst:** Trevor Morgan, Hilton Shaw and Jack Mitchell (area to be cleared covers 3 different properties) – see Map 2 below
- Map coordinates **Umgeni Poort:** 29.499928° S and 29.879443° E; **Lake Lyndhurst:** 29.477214° S and 29.853047° E
- Total area (hectares): Herbicide will be applied to parcels/plots at Umgeni Poort and Lake Lyndhurst which combine to **53ha** in total and is the equivalent of **35.14** condensed hectares as follows:

	Farm number & portion descriptions	Total area to be cleared (ha)	Condensed area (ha)
Umgeni Poort	2369/5; 5620/0; 6248/0; 10991/1	30.51ha	20.35ha
Lake Lyndhurst	14878/23; 14878/22; 17375/1; 14878/9	22.57ha	14.79ha
Total area:		53.08ha	35.14ha

Map 1 – Umgeni Poort: Areas to be cleared on Ivanhoe Farming Company property



Map 2 – Lake Lyndhurst: Areas to be cleared on property that falls under the management of the Lake Lyndhurst Lot Owners Association.



19. Assessment of environmental, occupational and public health risks associated with the transport, storage, handling and use of the proposed products under local circumstances, and the disposal of empty containers.

See attached PDF documentation on (i) WWF-SA Water Balance Herbicide Policy (Appendix A) (ii) Working for Water Herbicide Policy (Appendix B)

Note: Empty herbicide containers will be returned to the WfW Regional depot, where they will safely dispose of them as per government procedures.

20. Description of plans and results for tracking of damage to and/or deaths of non-target species prior to pesticide application and subsequent to pesticide application.

Pre-application site visit as well as regular post application site visits are undertaken by the WWF Upper uMngeni Co-ordinator as well as an annual visit by the Water Balance Monitoring and Evaluations officer from the WWF head office (Cape Town).

21. Pre-requisites and/or measures required to reduce specific risks associated with envisaged pesticide use under the project (e.g., protective gear, training, upgrading of storage facilities, etc.).

- General measures to reduce risks in terms of herbicide use are referred to under question 12 (policy guidelines on herbicide use).
- **Protective gear:** All Contractors are required to provide the following to their employees performing the following tasks, and these are specified in the contracts/agreements entered into between WWF & the Contractor:
 - Herbicide applicators:
 - Overall
 - Rain suit pants and rain suit jacket/cape (if using a knapsack sprayer)
 - Gum boots / safety boots with leggings
 - Hard hat
 - Chemical resistant rubber gloves (elbow length)
 - Goggles
 - Chemical mask
 - Chain saw operators and Brush Cutter operators:
 - Overall
 - Chainsaw pants
 - Steel-toe safety boots
 - Helmet
 - Gloves
 - Visors / goggles
 - Earmuffs or -plugs
 - Non-spill CombiCan
 - Sharpening kit and accompanying tools
 - Whistle
 - Bandages

Note: These protective gear stipulations are taken directly from the SA Government Working for Water Programme operating standards.

- **Training:** Staff within a clearing team that will be performing the herbicide application function are required to complete an accredited Herbicide Applicator training course (3 day course). This training covers the following topics:
 - Identification of Species (list of declared weeds & invasive plants)
 - Application methods
 - Types of herbicides
 - Herbicide safety
 - Herbicide application methods (e.g. cut stump, frill, foliar spray, ringbark)
 - Equipment maintenance

Herbicide Applicator Training was conducted for 10 staff members from Lake Lyndhurst & the Contractor who will be working at Umgeni Poort (R&M Consultants) from 9 – 11 September 2013 (refer to photos below). Service Provider: New Africa Skills Development.



Clockwise from top left: Theory component, Herbicide Applicator Training.
Top right: Demonstration by trainer of correct foliar spraying technique
Bottom left: Demonstration of the correct use of protective gear and equipment maintenance.

First Aid Level 1 and General Health & Safety Representative Training was conducted for the designated team members from each clearing team from Lake Lyndhurst & R&M Consultants who are the appointed First Aiders & Health & Safety representatives. This accredited training took place from 3- 5 September 2013. Service provider: Innovative Shared Services (ISS)

- **Herbicide Storage facilities:** These should adhere to the relevant guidelines, which appointed Contractors must agree to abide by: See attached WWF herbicide summary document.

22. Basis of selection of pesticides authorized for procurement under the project, taking into consideration WHO and World Bank standards, the above hazards and risks, and availability of newer and less hazardous products and techniques (e.g. bio-pesticides, traps).

All herbicides selected are registered herbicides which adhere to the policies of South African Government’s Department of Environmental Affairs, as they are approved herbicides for use by the National Resource Management: Working for Water (WfW) Programmes. WfW provides a

comprehensive database of all approved herbicides listed for each invasive species, with the stipulated dosages, required dilution factors and active ingredient information. WWF closely consults this database when determining appropriate types of herbicides to be used and when calculating herbicide quantities required. WWF has also taken a more cautious approach regarding one particular herbicide (namely Plenum) and although it is a registered and authorized herbicide used frequently by WfW teams, WWF has decided not to use this herbicide, due to concerns with possible residual effects in the soil, particularly in riparian areas.

23. Name and address of source of selected pesticides.

Working for Water, KZN Regional office, Department of Environment Affairs, Midmar Dam, Howick. (see also question 24 below).

24. Name and address of vendor of selected pesticides.

Water Balance has a Memorandum of Understanding with the National Resource Management: Working for Water Programme (which falls under the auspices of the National Department of Environmental Affairs) for the provision of herbicide. Address is the same as provided in question 23.

25. Name and address of facility where pesticides will be stored.

Herbicides are obtained from the Midmar depot at the KZN Regional office for Working for Water where herbicides are stored in locked containers in a secure, fenced area and fulfill all necessary SA Government regulations. See photo below. Seeing as this depot is en route to the Water Balance clearing areas, this will be the primary storage location, and smaller quantities will be collected from these premises as needed.

Site-based storage during the clearing operations is as follows:

- 1.) Umgeni Poort - herbicides will be stored at the Contractor's work premises which is located at 72 Riverside Farm, Lions River, 3260.
- 2.) Lake Lyndhurst – a lockable outbuilding/store room on the Lake Lyndhurst property has been upgraded to fulfill herbicide storage safety requirements which will only be accessed by the Chairman of the Lake Lyndhurst Lot Owners Association.



Herbicide Storage facility at the KZN Regional office for Working for Water

IV. Policy, Regulatory Framework, and Institutional Capacity

26. Policies on plant/animal protection, integrated pest management, and humane treatment of animals.

The very focus of this project, and WWF's mandate and work is on conservation of species and ecosystems (there are no specific WWF policies). Hence, its approach is about integrated solutions to land management and other issues in targeted catchments to ensure sustainable economic, social and environmental outcomes. It does this on project by project basis.

27. Description and assessment of national capacity to develop and implement ecologically-based alien and invasive species control.

The very focus of this project, and WWF's mandate and work is on conservation of species and ecosystems. As part of this approach, WWF would prefer the use of alternative, feasible, more ecologically friendly invasive alien plant control mechanisms.

WWF has staff, service providers and partnerships with other relevant organizations to evaluate the opportunities to develop and implement ecologically-based invasive alien species control mechanisms.

However, cost-effective and feasible options for such mechanisms are not presently available, but WWF will continue to keep a watching brief on any developments.

28. Description and assessment of the country's regulatory framework and institutional capacity for control of the distribution and use of pesticides.

Water Balance works closely with the Government programme called Working for Water which deals with invasive alien plant eradication. It is through this programme and its parent programme, the Department of Environmental Affairs' Natural Resource Management Programme, that South Africa's institutional capacity is established for the control of the distribution and use of herbicides in Invasive Alien Plant Control.

29. Proposed project activities to train personnel and strengthen capacity (e.g., type of training, number of people to be trained).

Refer to information on training provided in question 21. Additional training of clearing teams will be carried out as new properties are identified where clearing work will take place.

30. Confirmation that the appropriate authorities were approached (e.g., names and titles of authorities, dates) and that the appropriate licenses and permissions were obtained by the project.

Permission to use herbicides is not formally required considering all herbicides used are those that are registered and endorsed by the SA Government WfW programme. However according to the Fertilizers, Farm Feeds, Agricultural Remedies and Stock Remedies Act, No 36 of 1942, companies that clear invasive species for commercial gain (i.e. independent contractors, not landowners) are required to have a Pest Control Operator License. R&M Consultants are in possession of such a valid Pest Control Operator certificate, and is available upon request.

V. Consultation

31. Plans for, dates, and results of expert consultations, if necessary.

No expert consultations have been required to date over and above the normal interactions with the WWF Water Balance and WfW staff. At least 3 meetings have been held with Working for Water within the last 6 months regarding collaboration and herbicide assistance.

32. Plans for, dates, and results of consultations with local communities.

No local communities are affected by the proposed clearing work and therefore local community consultation is not required. The Water Balance Programme has been designed as a partnership with landowners who are involved in every step of the way and are required to sign Water Balance agreements before clearing begins, which ensures they have been consulted.

VI. Monitoring and Evaluation

33. Description of activities related to pest management that require monitoring during implementation.

- Herbicide use and application methods, as per the WWF Herbicide Policy for its Water Balance programme (Appendix A)
- Percentage kill of target species - a low percentage kill rate will indicate problems; such as wrong herbicide, incorrect dilutions or application, etc.
- Percentage kill of, or application on non-target species, or evidence of herbicide on areas other than target plants
- Lack of dye - this may result in target species being missed, thus necessitating another application, or may result in higher than necessary application rates, since the applicator can't see which plants have been treated or not.
- Cut stumps/stems cut too high - can result in lower kill rate, thus requiring repeated treatments.
- Foliar herbicide used on plants that are too large (i.e. higher than specified 1m in height). This requires much more herbicide, and can result in pollution and kill of non-target species.
- Check for spillage and pollution, e.g. herbicide on ground or adjacent to waterways.
- Check that equipment complies with specified operational standards and is functioning correctly
- Check that herbicide storage areas comply with requirements.
- Check that redundant equipment is disposed of in the specified manner

34. Monitoring and supervision plan, implementation responsibilities, required expertise, and cost.

This will be addressed as part of the APO development for the specific sites.

Overall: The WWF Upper uMngeni Project Co-ordinator (Susan Viljoen) will be responsible for overseeing all aspects of the implementation of the Water Balance clearing in the catchment, contract design and securing contractual agreements and managing the necessary budgets.

The Project Co-ordinator will carry out at a minimum quarterly Monitoring & Evaluation assessments and regular field inspections to assess progress and compliance with the WWF Herbicide policy by the Contractors and /or relevant landowners. WWF-SA shall inspect and audit and/or facilitate the inspection and audit of the Clearing Project on a regular basis to monitor and evaluate the effectiveness of the IAP clearing process and ensure compliance with the agreed norms and standards, and shall provide the Landowner with relevant feedback. The monitoring & evaluation report shall have a bearing on Progress Payments to an appointed Contractor/Implementing Agent.

The Contractor/Implementing Agent is also required to provide effective supervision and monitoring of their own teams as per the contract requirements and provide WWF with progress reports as per an agreed schedule and format.