17. HOW TO START: "IMPLEMENTING" YOUR RHP IMPLEMENTATION PLAN

Right, now that you've gone through all the preparations, lets get down to the real business of doing the RHP. Where to start? A good place to begin is to revisit the goals and objectives set out in your implementation plan.

17.1 SELECTING A TEST RIVER CATCHMENT FOR THE PILOT PHASE

After careful study of the maps of your area and consultation during the R&D stage, you should have an idea of potential test catchments for the pilot phase. An initial "groundtruthing" survey of the selected rivers is part of the selection process . This will give you a "feel" for the area while choosing a test river catchment (or catchments) for the pilot phase.

Criteria to bear in mind while choosing a test river catchment:

- **$** suitability of the catchment from a RHP perspective - preferably with perennial flow and a range of sites from relatively pristine to impacted (for selection of reference and monitoring sites)
- **$** relative importance within your province or WMA - is the river important for water supply or conservation or possibly under threat from development or industry
- **$** proximity and accessibility - does it have a number of good access points.

17.2 SITE SELECTION IN YOUR TEST CATCHMENT

Once you've decided on your test catchment, the next step is to select your biomonitoring sites. Site selection is process of exploring and evaluating whether a potential site measures up to the criteria required for the biomonitoring you intend doing. Although this is theoretically an objective process, a subjective decision is often the result due to various practicalities. Two main categories of sites are required for your RHP, namely: ***reference*** and ***monitoring sites***.

Site selection can begin with looking at the relevant maps or if the aerial survey of the river was undertaken as part of the Index of Habitat Integrity, potential sites may have been identified from the air. Replaying the video may provide further confirmation of possible sites to be investigated. Consulting local residents, researchers, regional DWAF and District Council officials for sites to consider may also be useful (Figure 4). Other potential sites for consideration may emerge from the public participation process.

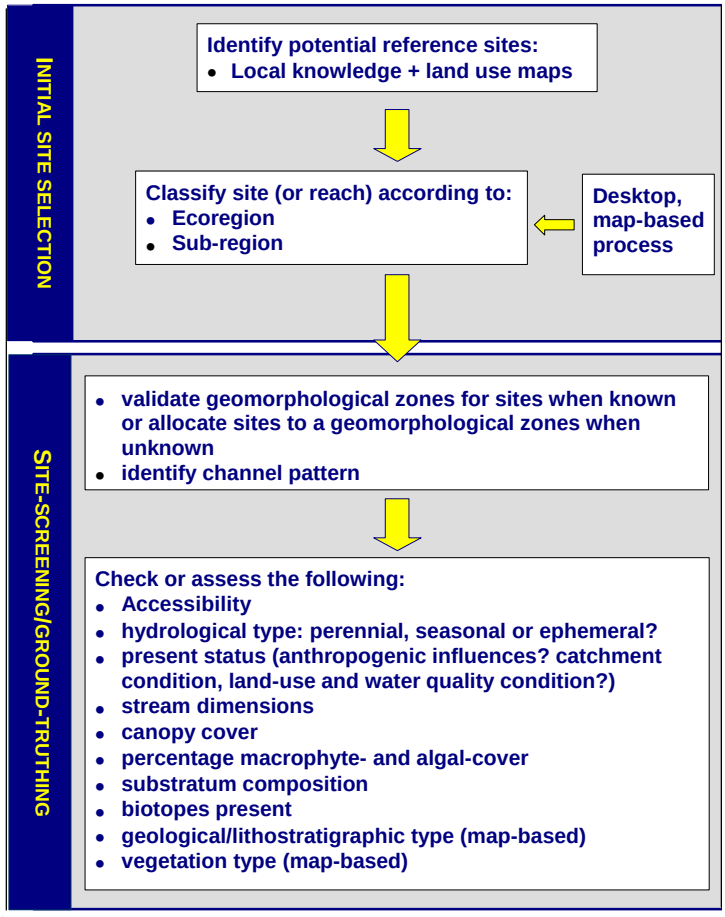

Figure 1. The site selection process (adapted from Dallas, 2000).

It should be borne in mind when selecting sites that the different RHP Indices have different site criteria. For example, SASS requires a diversity of biotopes (habitats) within a 20 m section of the river, while the FAII requires a “homogenous fish segment” of river which may by 100's of meters in length.

All sites should have ***good perennial flow***, with a ***wide range of available biotopes or habitats*** (particularly for SASS monitoring). Make sure that your potential sites are relatively ***accessible.*** In practical terms, this means that one can get fairly close to your site by road and to the water’s edge by foot within a reasonable period of time.

If one needs to enter private land, then make prior arrangements with the landowner and explain what you intend doing and why you need to enter the land. Failure to do so constitutes trespassing which not only shows lack of consideration, but may jeopardise future monitoring on the owner’s property.

Useful tip!
Another option to pursue is to consult with organisations which may have an existing monitoring programme in the test catchment, such as municipalities or district councils. Visit their monitoring sites to assess the suitability of these for biomonitoring. This has an added advantage in that the RHP can contribute another “layer” of information to an existing monitoring programme and vice versa.

Additional factors to consider for potential site evaluation:

- **$** The site’s position for the detection of possible water quality impacts in the test catchment from the surrounding land-use practices
- **$** Importance of the site for assessing water quality for human and other needs
- **$** Suitability for monitoring the recovery of the aquatic ecosystem after a major impact
- **$** Conservation importance of the site. Is it upstream or in a nature reserve?

All sites should be photographed and sampled to obtain initial results. This is an important component of the selection process, as site selection goes beyond just visual assessment.

Remember to inform the PMT about the selection process and which sites have been provisionally selected. It is recommended that members of your PIT then accompany the PMT members concerned and show them the sites and which biotopes to sample.

NOTE:
Selecting suitable sites may take time. It can be expected that conditions at prospective sites may change over time. Seasonal and natural fluctuations in water flow, catastrophic events such as floods and droughts and anthropogenic (human-induced) developments within the catchment will all affect the condition of the sites.

Ideally, sites should be assessed over the entire year to obtain an idea of site conditions during both the wet and dry season. For this reason, your first year of active biomonitoring will be partly devoted to assessing the suitability of your initial selection of sites.

17.2.1 Reference sites

Reference sites, as the name implies, are used to determine the “reference condition” against which results obtained from the monitoring sites can be compared. Hence it is imperative that these sites are relatively unimpacted (preferably pristine!) where water quality is deemed to be natural (or as close to natural as possible) with optimal aquatic ecological conditions. For SASS and IHAS reference sites, a wide variety of available biotopes (habitats such as stones, marginal vegetation, sediment) should be present (Figure 5).

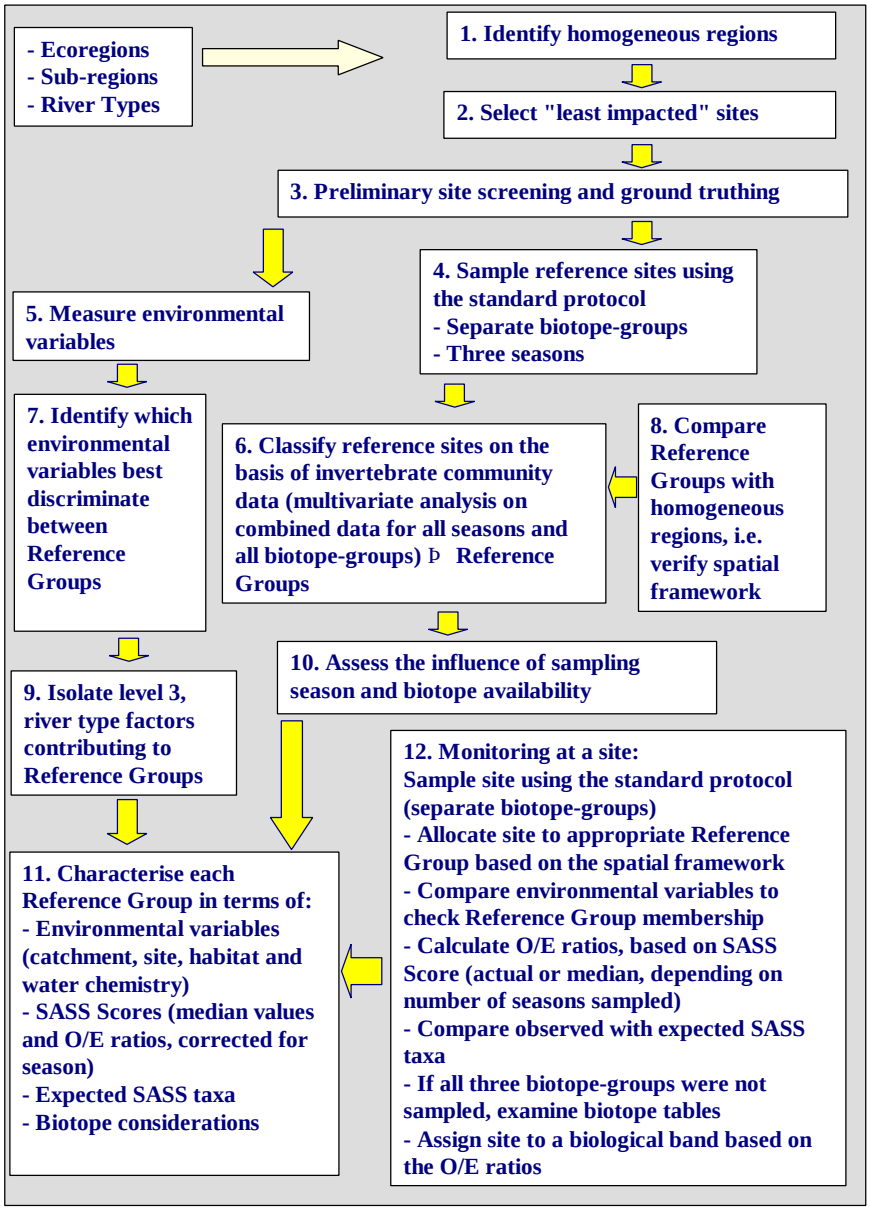

Figure 2. Proposed protocol for deriving ecological reference conditions for riverine macroinvertebrates (adapted from Dallas, 2000).

Preferably more than one reference site is needed per river and optimally one for each reach of the river i.e. near the source or unimpacted tributary of the river, in the middle reaches and lower reaches. However, as most unimpacted or pristine sites tend to be situated in the upper reaches of rivers, you may only be able to find one for each river in there.

NOTE:
In reality, it isn’t easy to find such “ideal” sites in the field. So a good place to look for these is in nature reserves or protected areas if these are within your catchment. Sites on tributaries may also possess good reference characteristics.

17.2.2 Monitoring sites

Monitoring sites should ideally be randomly chosen to reflect the general range of ecological conditions within the catchment. Monitoring sites should be located so that the full range of the effects of the different landuses within the catchment can be evaluated. This is important to obtain objective information for state of the environment (SoE) reporting on environmental trends within the catchment.

Some monitoring sites may be intentionally chosen to assess the effects of specific environmental problems such as point-source pollution entering the river. In this case, they should be located as close as possible (both upstream and downstream) to potential points of impact such as industrial or mine effluents and confluences of rivers.

For more details on site selection, consult Eekhout *et al.* (1996) NAEBP Report No.3 and Dallas, H. F. (2000) NAEBP Report No.10.

NOTE:
There is no minimum or standard number of either reference or monitoring sites required for each river catchment. The number and quality of sites will be governed by the availability of suitable sites within the catchment (tributaries and main river included). Ideally, at least 10 monitoring sites should be considered for each catchment.

Once the PIT and PMT are satisfied with the preliminary selection of monitoring and reference sites, RHP experts may be consulted to verify the suitability of the initial site selection and assessment. A unique identifying number (or site code) should be allocated to each site once it has been “OKed” for inclusion into your RHP.

Baseline surveys of aquatic fauna and flora by experts are very useful for the initial stage of the programme. These provide a detailed benchmark inventory of biodiversity in your test catchment to which future monitoring results can be compared. This is particularly useful for the invertebrates, as there are often a wide variety of species in one river system.

NOTE:
A detailed initial “once-off” ecological assessment of conditions at each of the sites is needed for the Rivers Database. A standard form is available for this (see data storage and information management section).