



water & sanitation
 Department:
 Water and Sanitation
 REPUBLIC OF SOUTH AFRICA

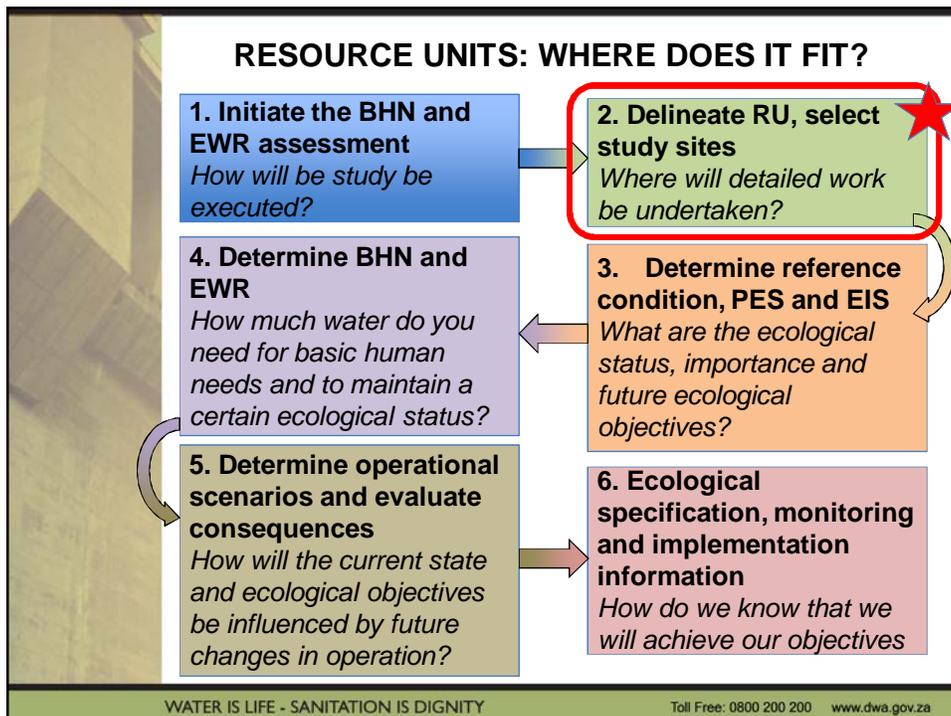
Determination of Ecological Water Requirements for Surface Water (Rivers, Estuaries and Wetlands) and Groundwater in the Lower Orange WMA: WP10974

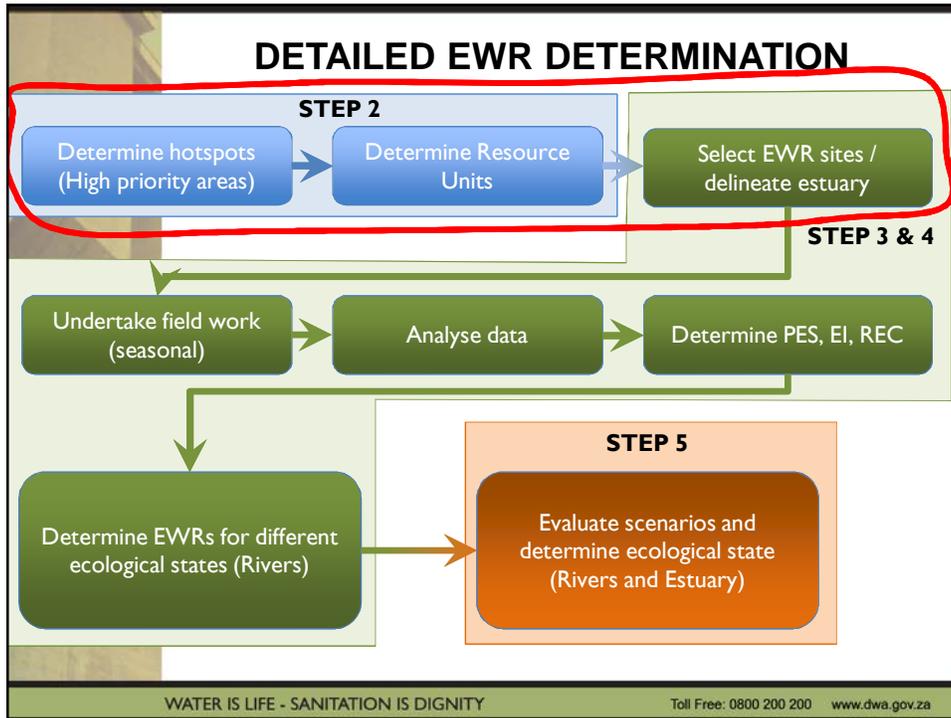
23 June 2016

RIVERS, ESTUARIES AND WETLAND RESOURCE UNITS AND EWR SITES

Delana Louw: Rivers for Africa
James Mackenzie
Lara van Niekerk

WATER IS LIFE, SANITATION IS DIGNITY

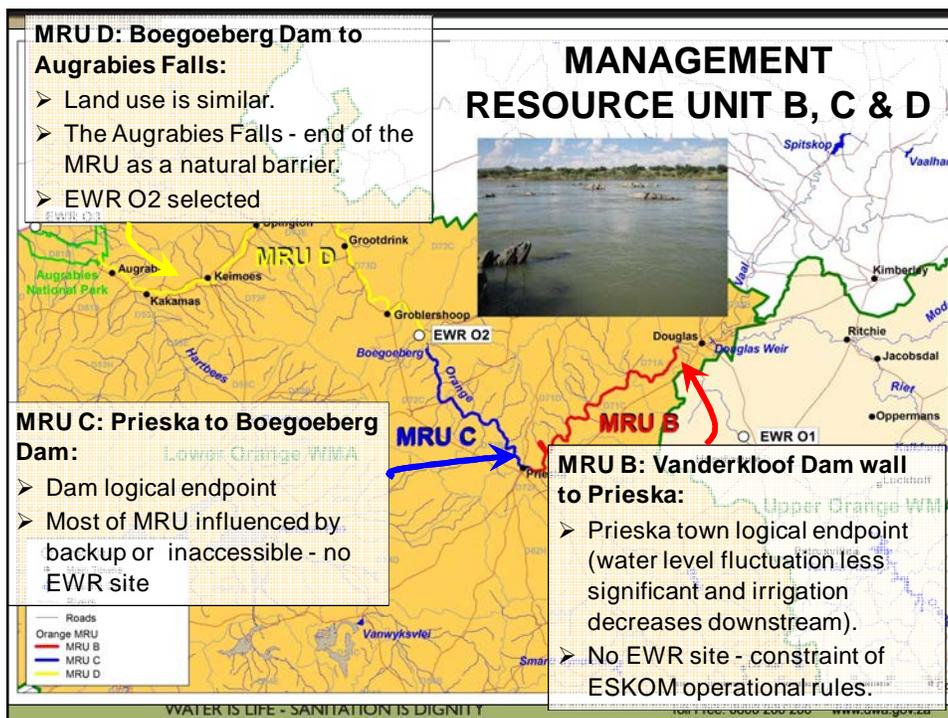


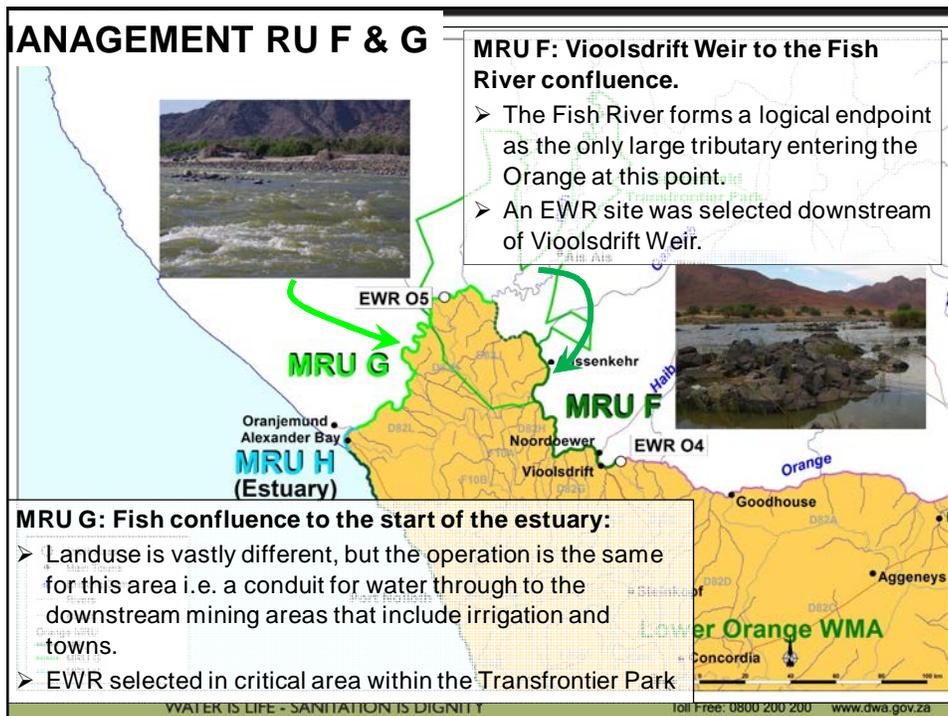
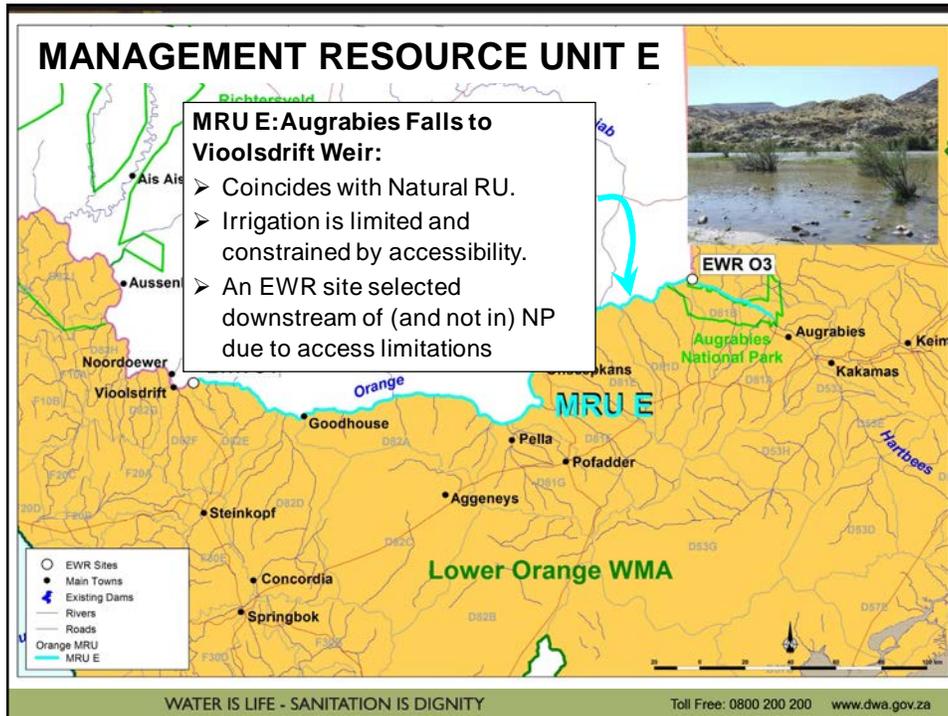


WHAT ARE RIVER RESOURCE UNITS?

RUs require different EWRs (due to different flow patterns, reaction of habitat and biota to stress, management and operational structures).

The detailed approach refers to Management Resource Units

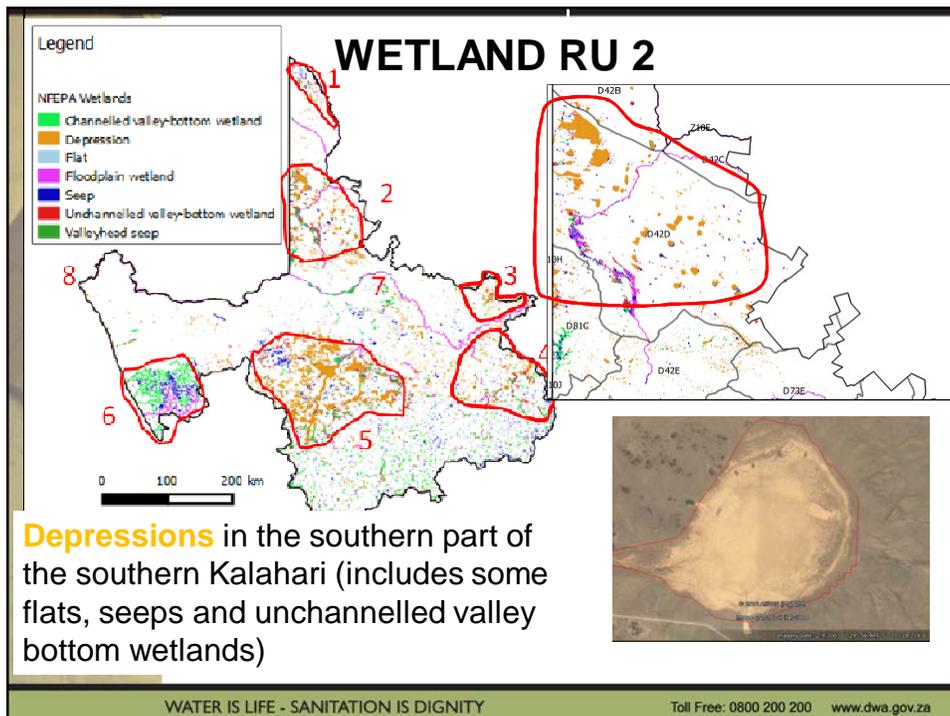
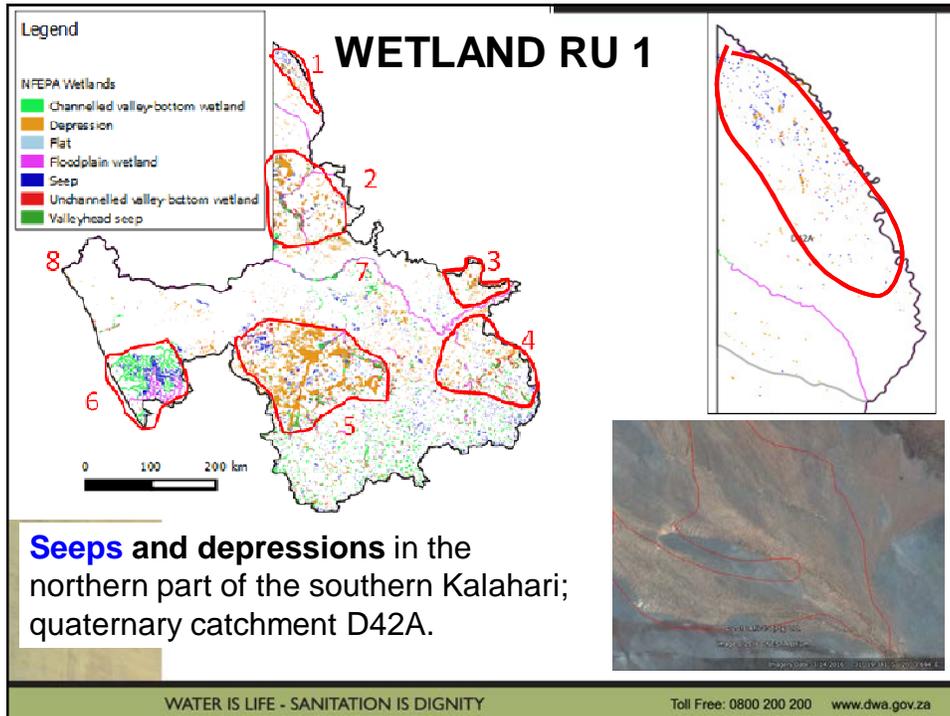


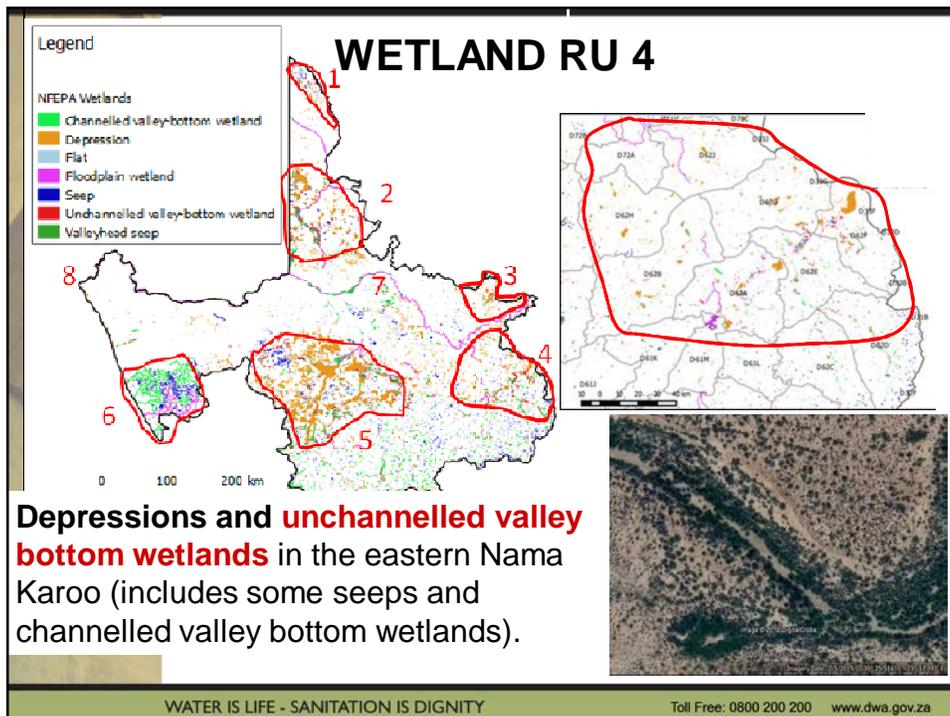
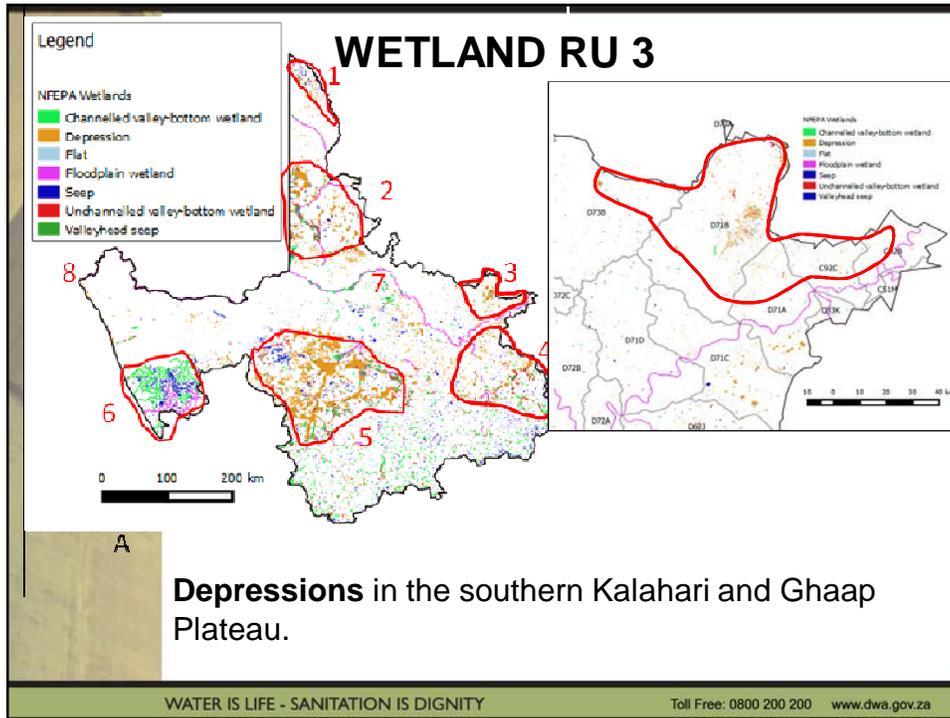


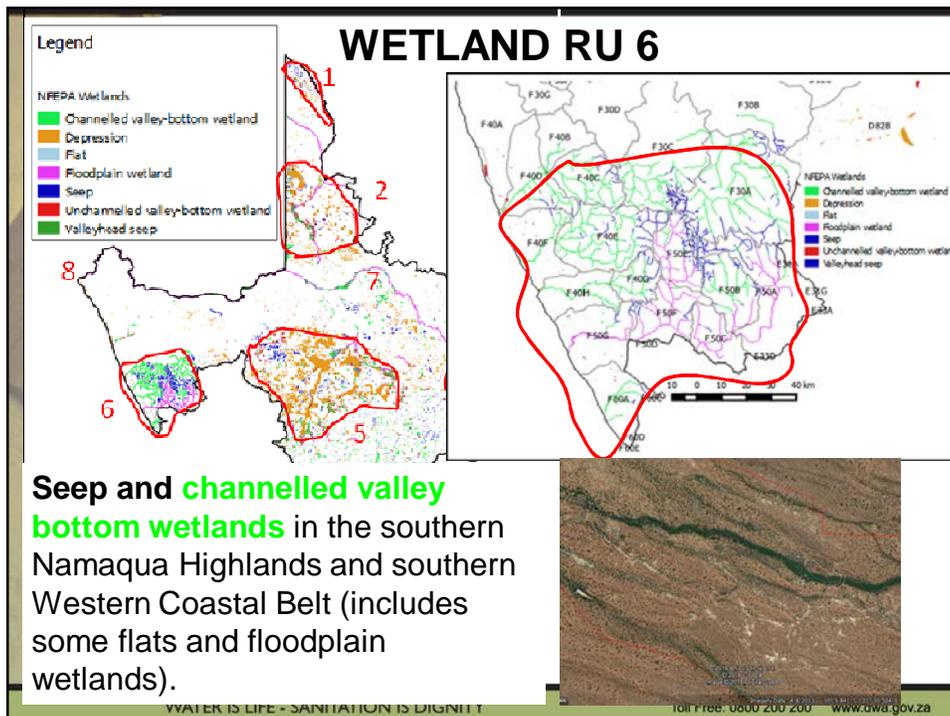
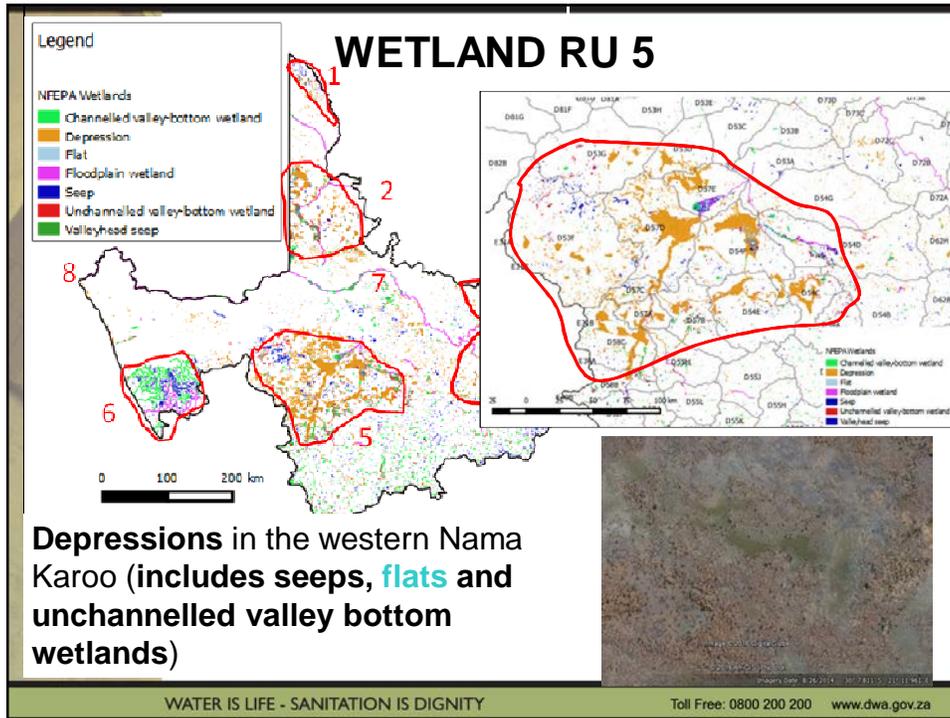
WETLAND RESOURCE UNITS

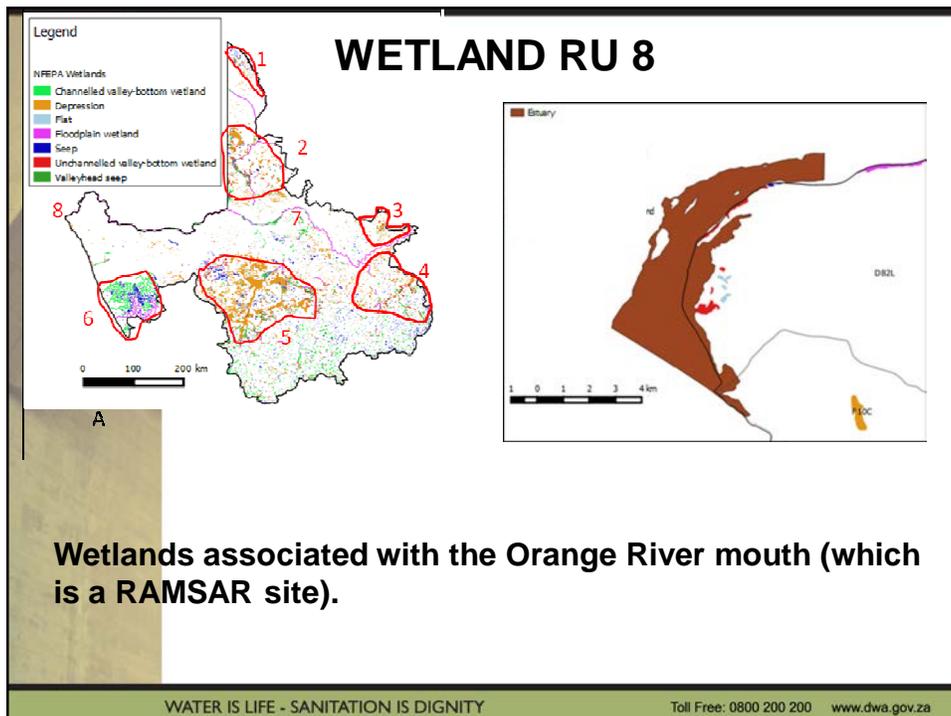
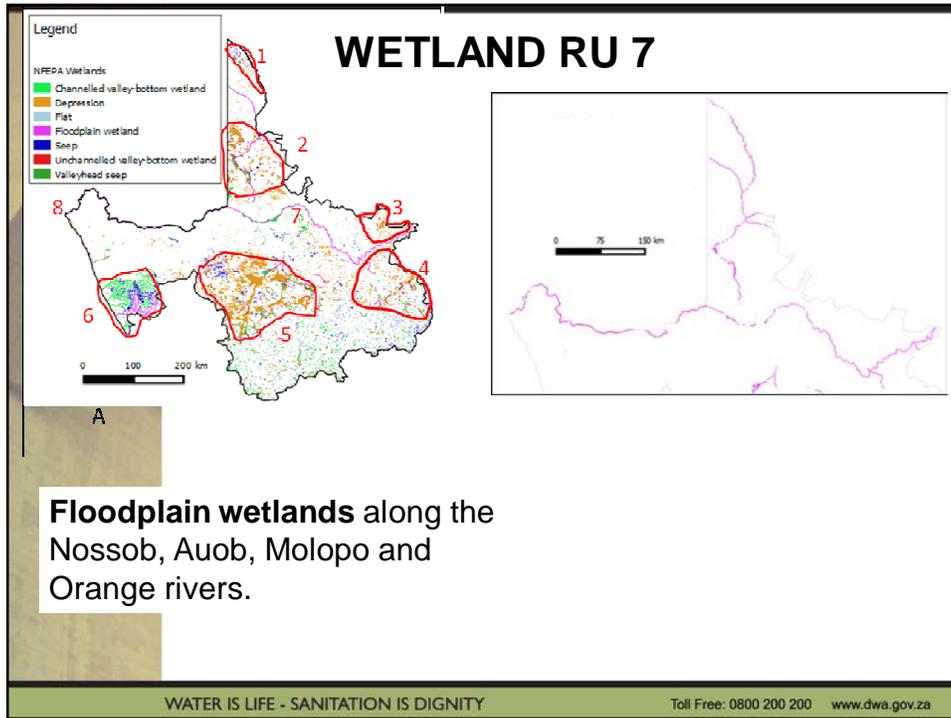
WHAT ARE WETLAND RESOURCE UNITS?

Wetland RUs: Wetlands are classified into different types termed hydro-geomorphic units, i.e. according to its hydrological and geomorphological context within the landscape. Each wetland type will have generic functionality, hydrological requirements and management strategies. RUs therefore represent similar wetland types in the geographic area (catchment).









ESTUARY RESOURCE UNITS

DELINEATION

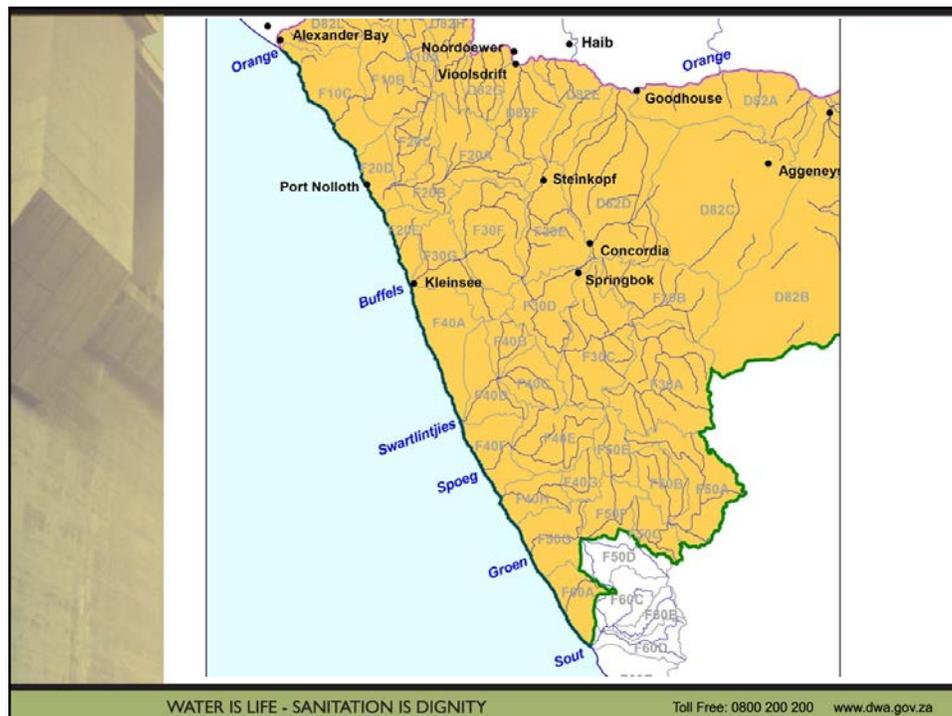
- **Estuary delineation must include all areas subjected to tidal action or back flooding when mouth closes, i.e. all estuarine associated vegetation and processes not only the estuary water body but also supporting physical and biological processes and habitats necessary for that estuarine function and health**
- **Downstream boundary: Estuary mouth. Upstream boundary: limits of tidal variation or salinity penetration, whichever penetrates furthest.**
- **Map the Estuary Functional zone based on the 5 m contour (Survey and Mapping, Mowbray)**

SELECTION OF ESTUARIES FOR FURTHER WORK

- Considered all permanent coastal water bodies (i.e. water bodies that do not dry out) that are sporadically, or permanently, linked to the sea as estuarine systems, e.g. the Groen and Spoeg. Ephemeral systems such as the Holgat, which dries out, are excluded.
- Where no orthophotos were available (e.g. Groen and Spoeg), floodplains were mapped from Spot 5 imagery using changes in topography and vegetation types as indicators.
- Apart from the Orange, the following estuaries will be assessed: Swartlintjies, Buffels, Groen, Spoeg, Sout

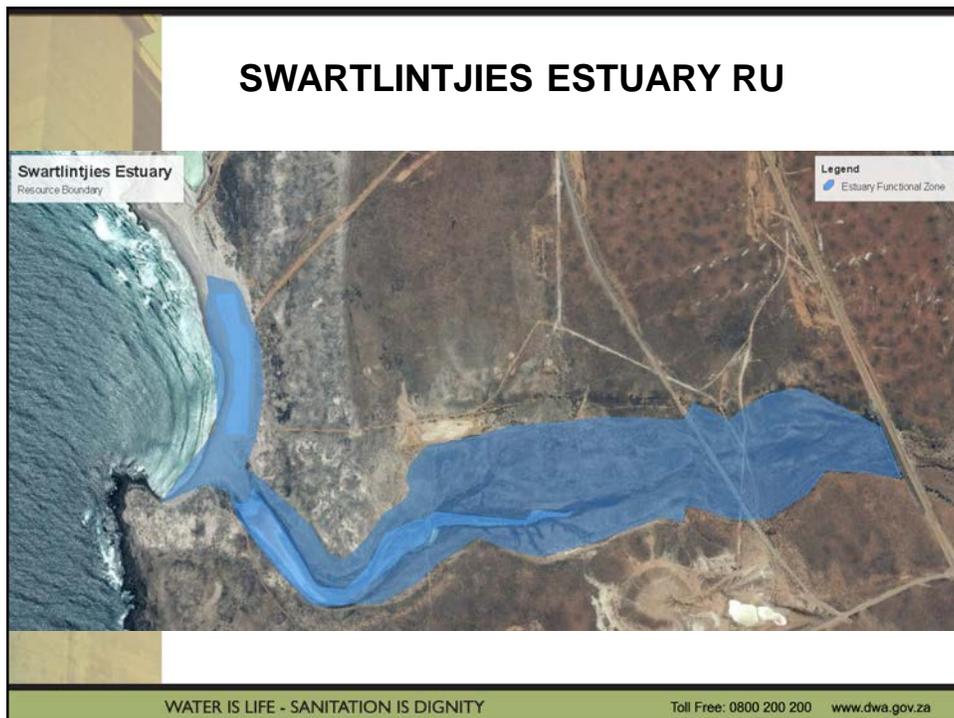
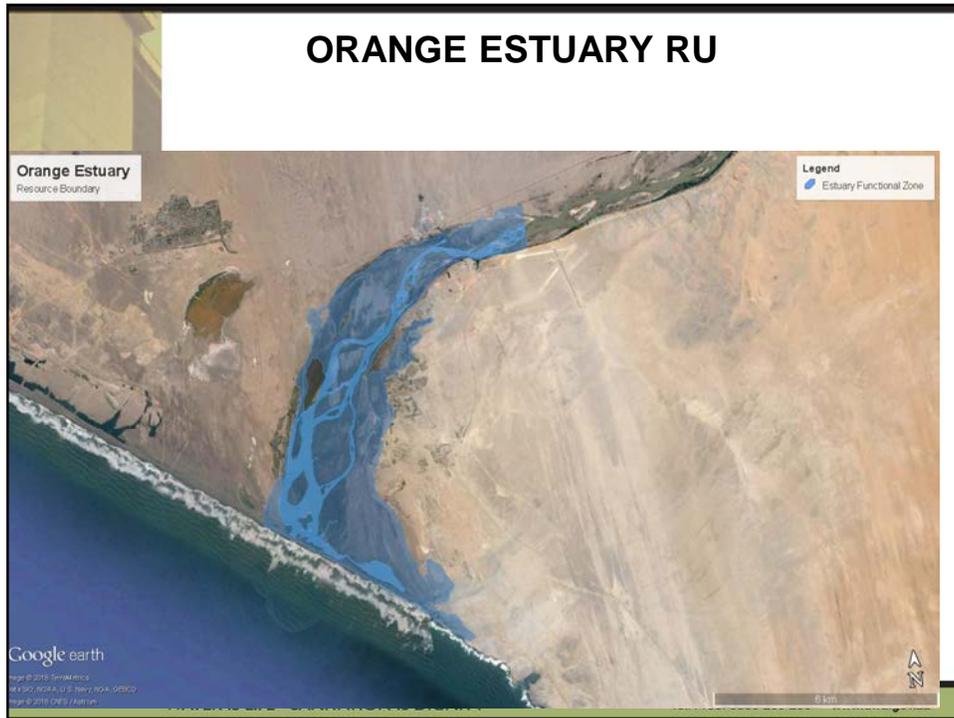
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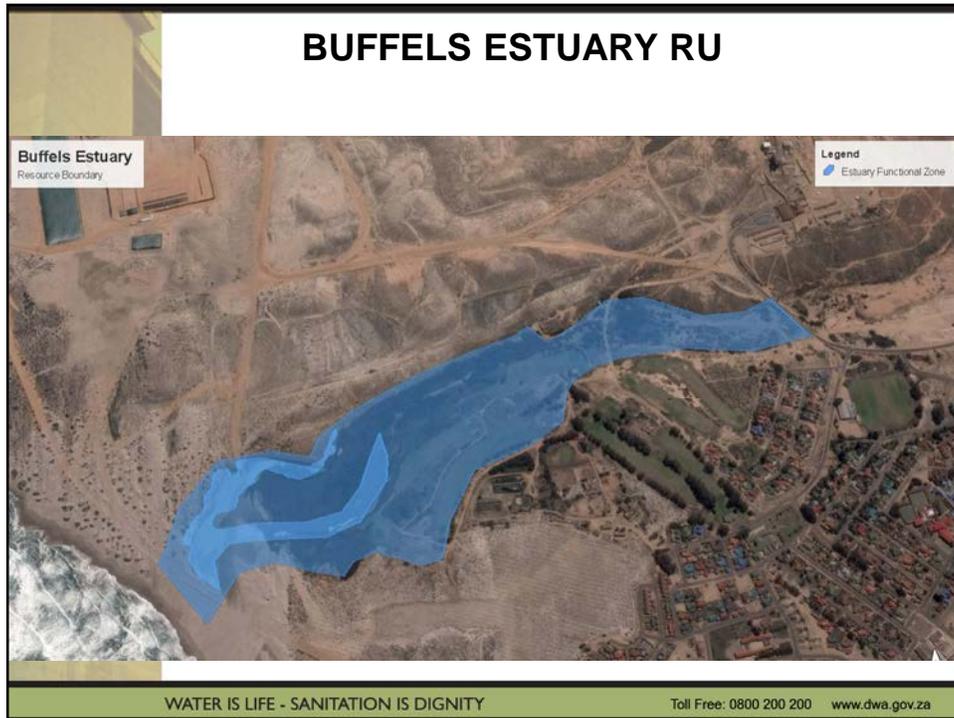
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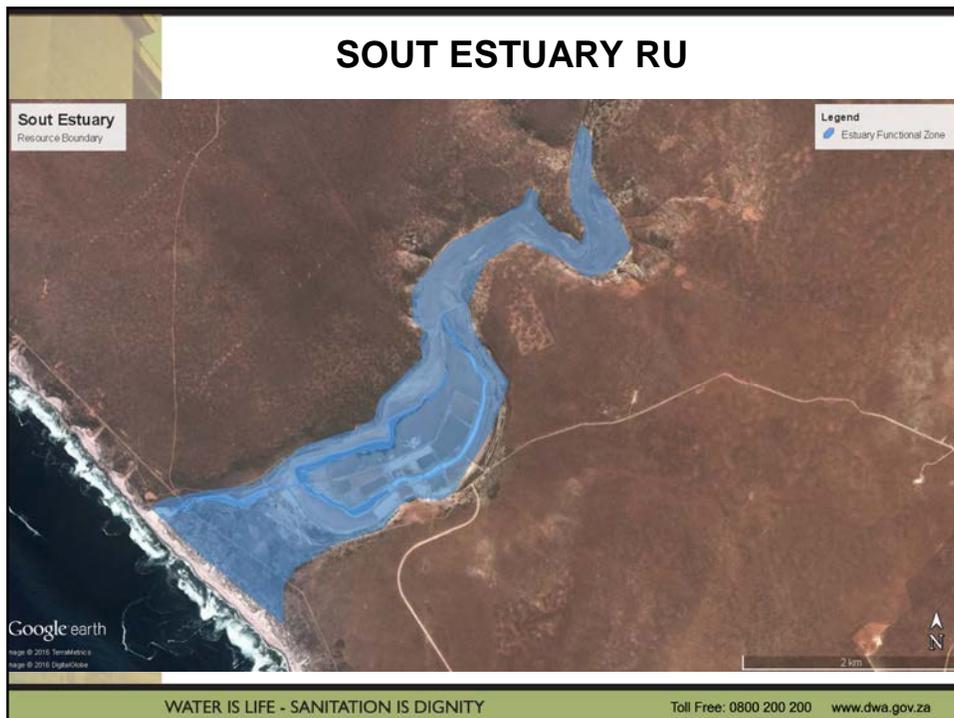
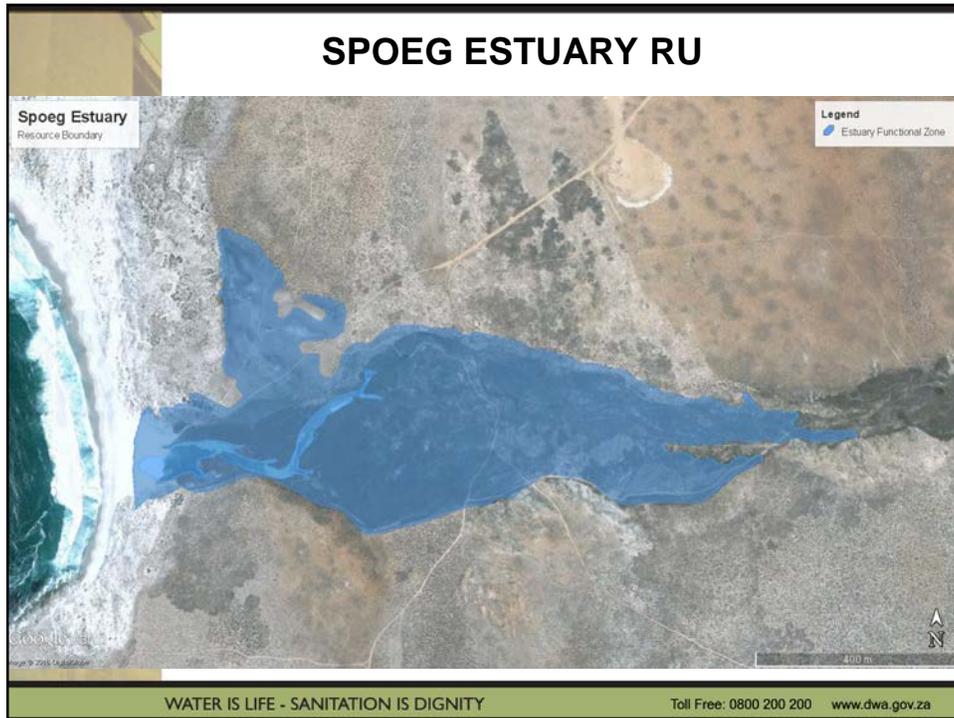


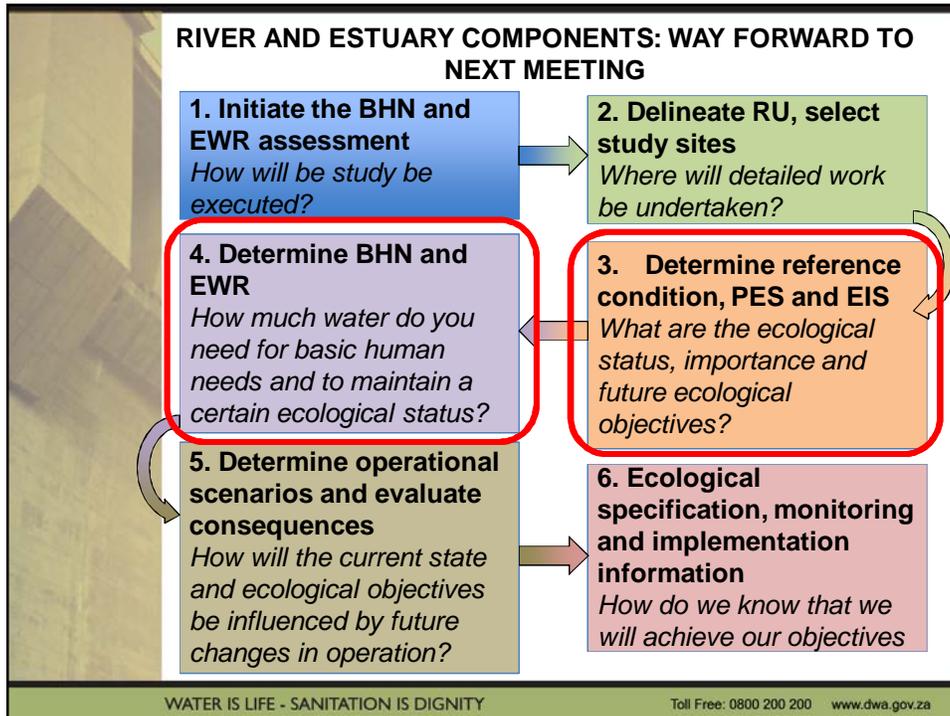
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QUESTIONS FOR CLARIFICATION

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