

# Progress and lessons associated with adaptive management of the Kruger National Park's river systems



**Craig McLoughlin**

**SANParks  
Water Research Commission**

8<sup>th</sup> Annual Savanna Science Meeting  
March 2010

# Application and testing of a Strategic Adaptive Management system for freshwater protection



**SANParks**

**3 Year Project:  
April 2008 to March 2011**



**Water Research  
Commission**

## **Project Team:**

Craig McLoughlin  
Stefanie Freitag-Ronaldson  
Rina Grant  
James MacKenzie  
Mark Rountree  
Thomas Gyedu-Ababio

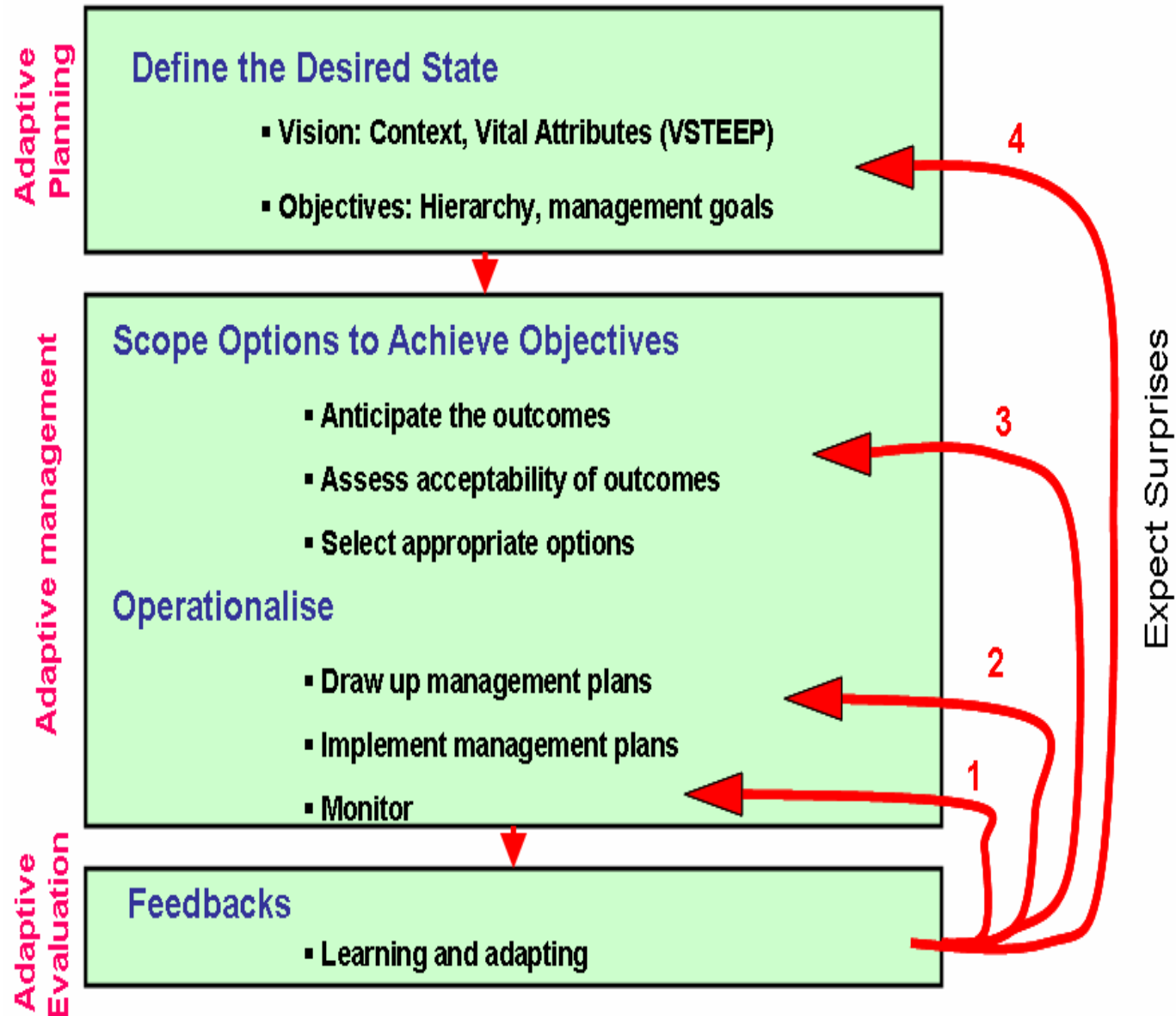
## **Steering Committee:**

Harry Biggs  
Kevin Rogers  
Sharon Pollard  
...  
...

## **KNP Staff:**

Andrew Deacon  
Hendrik Sithole

# ADAPTIVE MANAGEMENT CYCLE



1. Is monitoring adequate, cost effective, feasible?

3. What were the outcomes & was this acceptable?

2. Did the selected management plan get implemented?

4. Were the outcomes in line with the Objectives, Vision?

Adapted from  
Pollard and  
du Toit (2007)

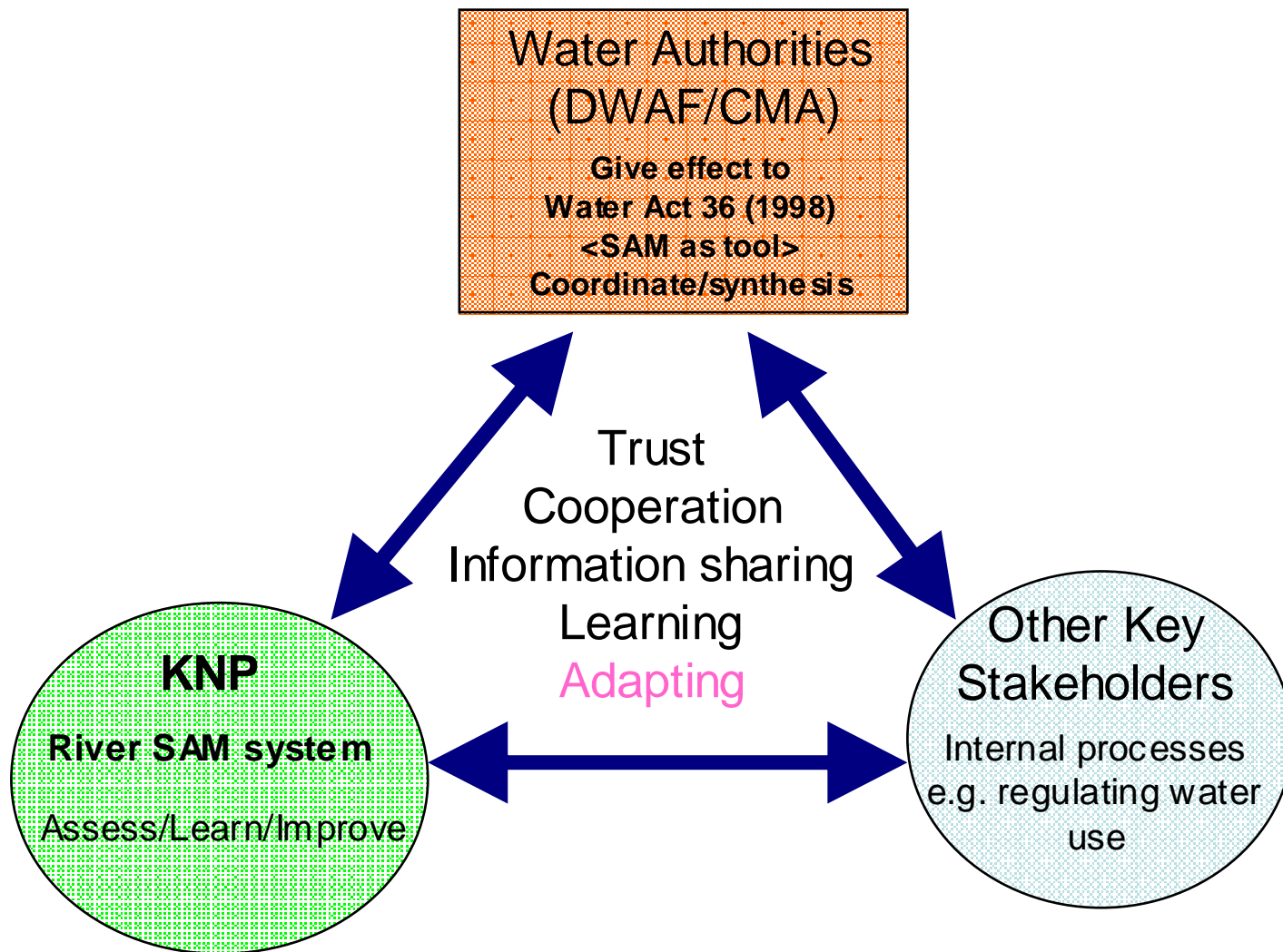
## **Increasing body of literature:-**

- **Dealing with uncertainty**
- **Theory of Adaptive Management, learning-by-doing**
- **Large application - natural resource management**

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## **Evidence limited - successful implementation?**

**e.g: Stankey *et al.* 2005; Meduma *et al.* 2008;  
Walters 1997; McLain and Lee 1996; ...**



- **AM implies knowledge production** – policy & management actions
- Knowledge is disseminated to all interested groups
- Actually used!

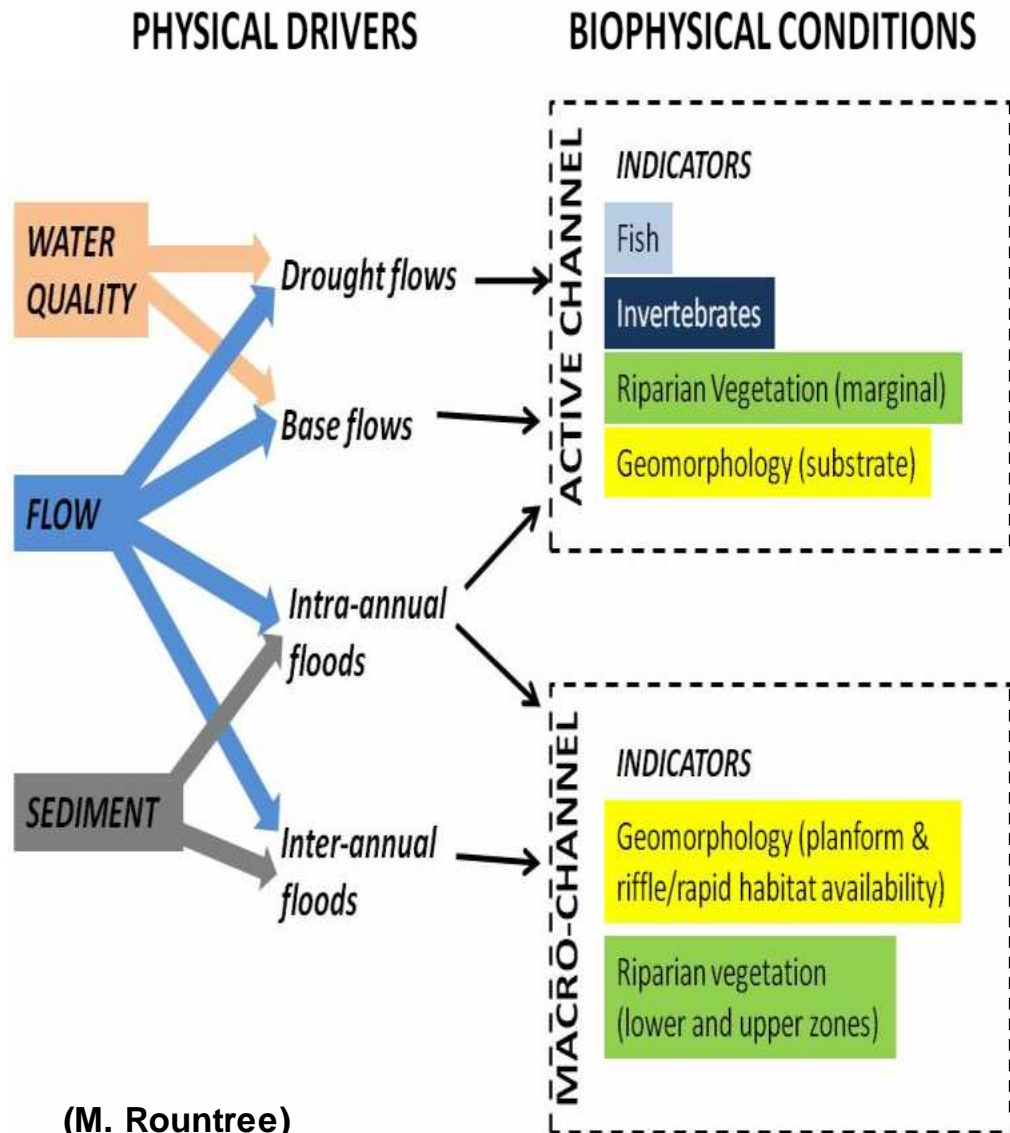
- **Learning** both technical and social process

- > Lack of learning - lack of data/information
  - information exists – not made available
  - information exists – inadequate form

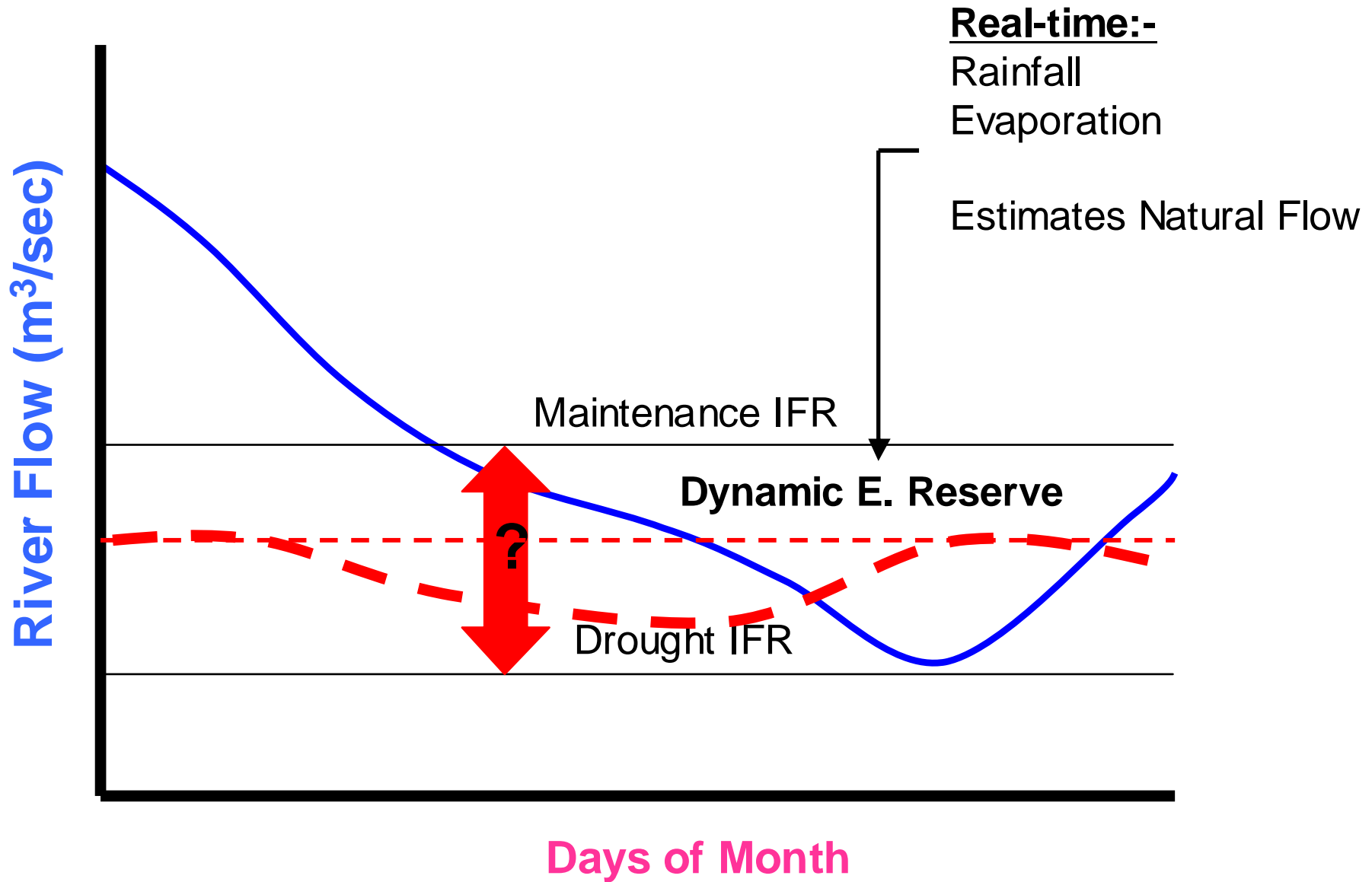
**Example in KNP SAM system:**

**Improvements in River flow monitoring & feedbacks**

# Water Act (N° 36 of 1998) Ecological Reserve Sustainability

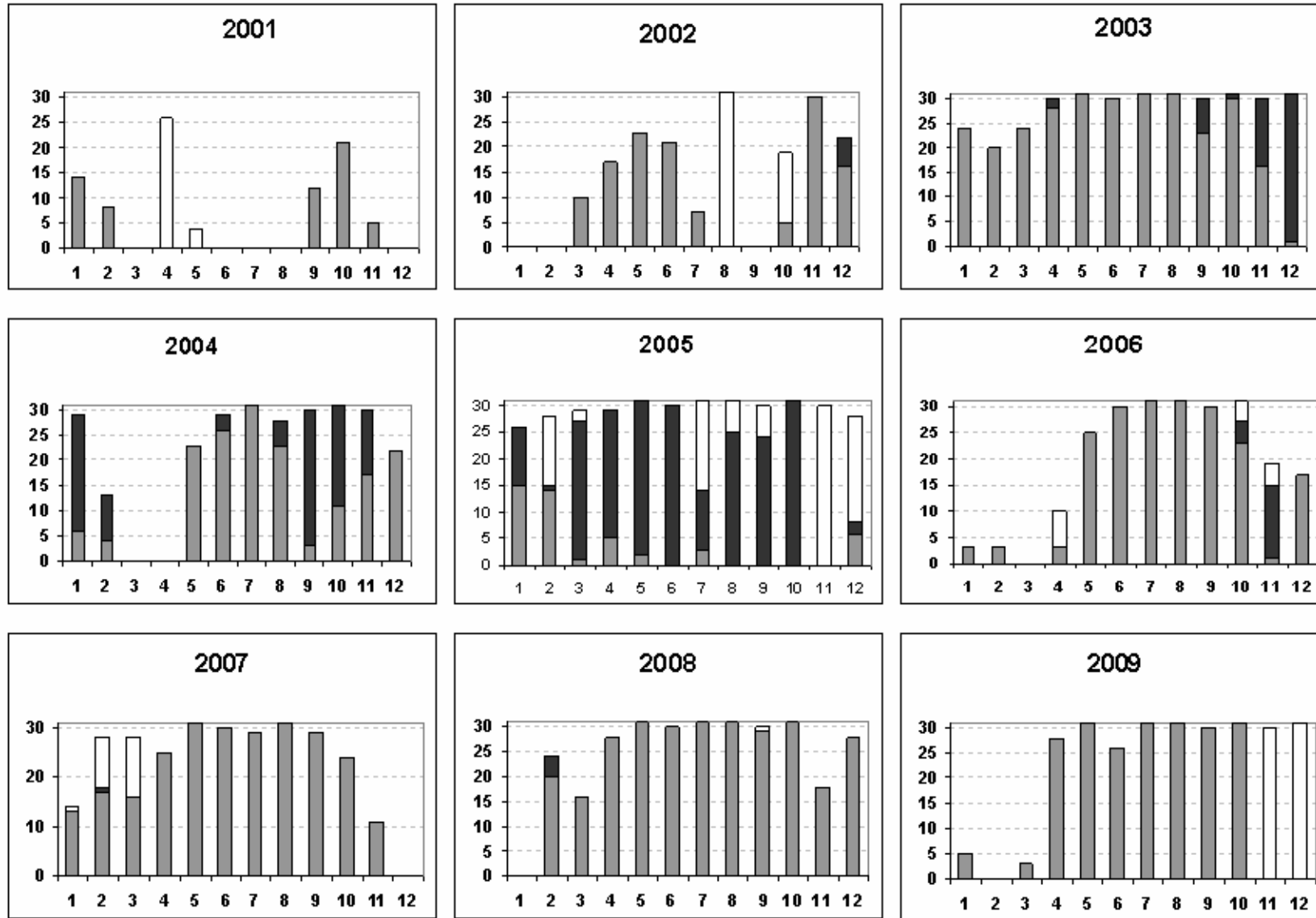


**ECOSYSTEM GOODS & SERVICES**



# Letaba River (B8H008 Letaba Ranch)

Number of Days in Month IFR Violated



Months (January - December)

Below Maintenance IFR
  Below Drought IFR
  Missing Data

# Pre-2008

Difficult to assess/interpret

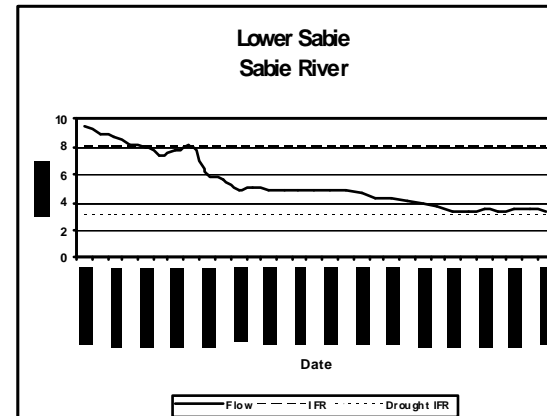
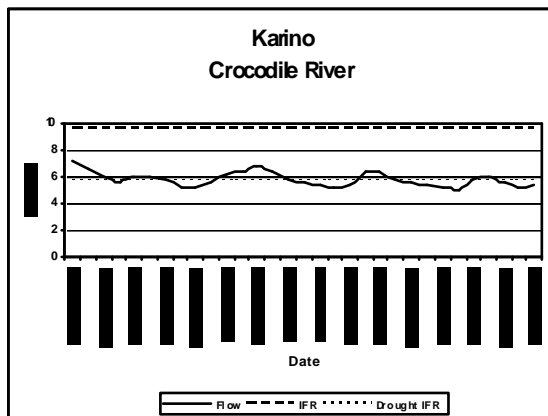
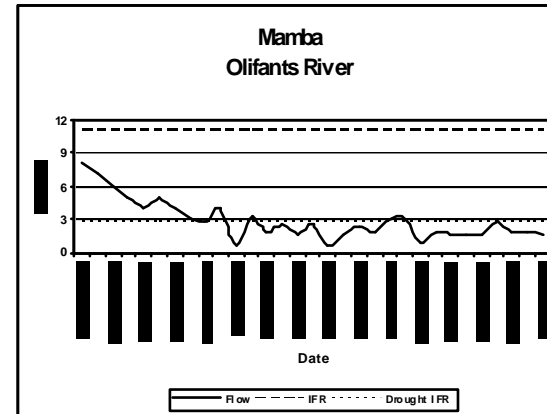
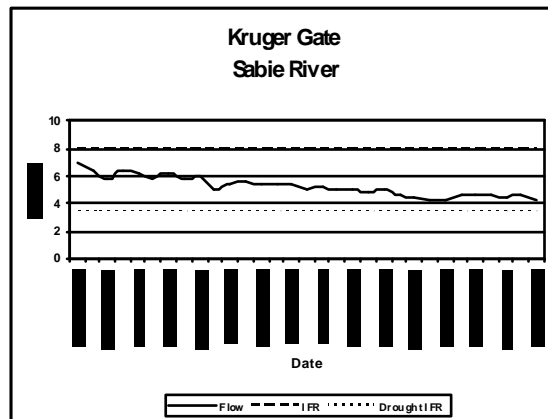
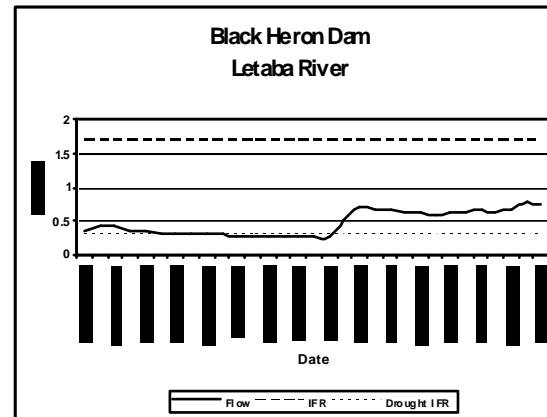
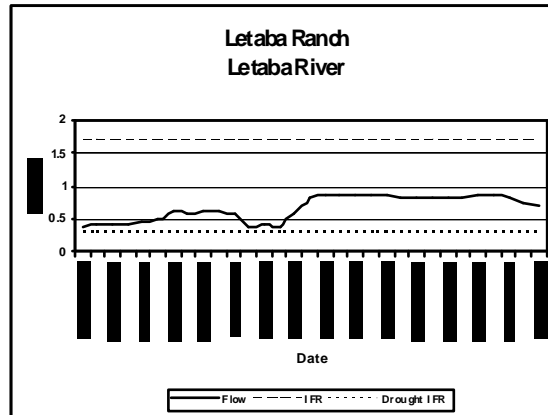
Subjective TPC tabling

➤ IFRs violated?

Inadequate feedback:-

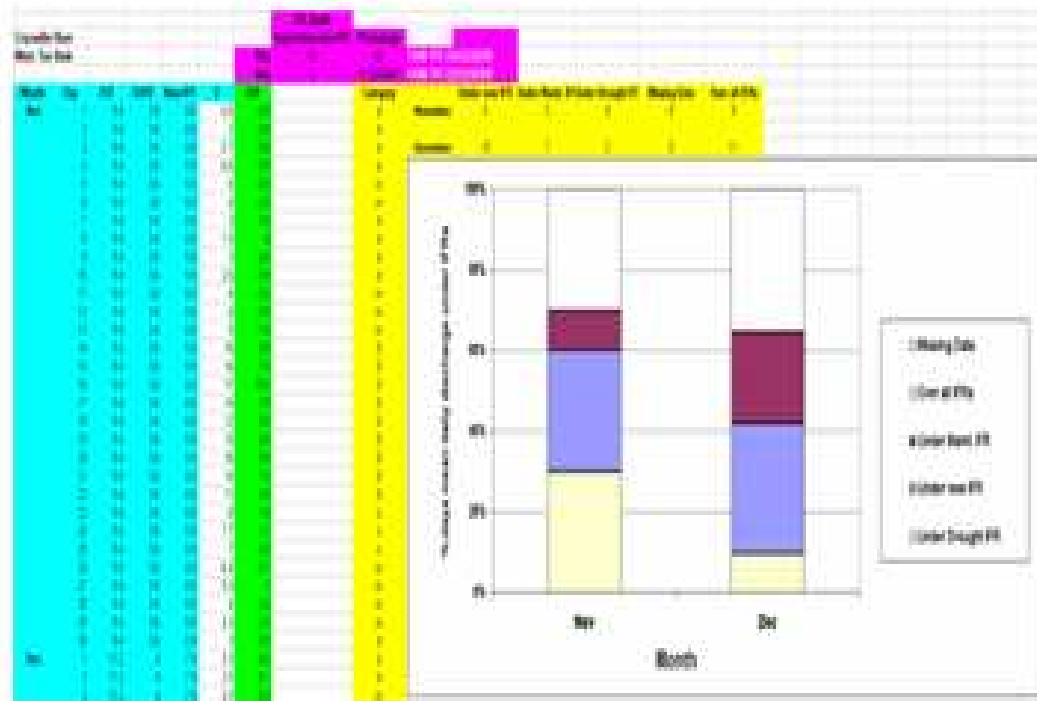
➤ Management action taken

➤ Consequences



# 2008

## TPC audit spreadsheet



## Management Log

DATE/TIME	START/END	DESCRIPTION	BY
11/11/08	11/11/08	Site visit to the site	John Smith
11/12/08	11/12/08	Site visit to the site	John Smith
11/13/08	11/13/08	Site visit to the site	John Smith
11/14/08	11/14/08	Site visit to the site	John Smith
11/15/08	11/15/08	Site visit to the site	John Smith
11/16/08	11/16/08	Site visit to the site	John Smith
11/17/08	11/17/08	Site visit to the site	John Smith
11/18/08	11/18/08	Site visit to the site	John Smith
11/19/08	11/19/08	Site visit to the site	John Smith
11/20/08	11/20/08	Site visit to the site	John Smith
11/21/08	11/21/08	Site visit to the site	John Smith
11/22/08	11/22/08	Site visit to the site	John Smith
11/23/08	11/23/08	Site visit to the site	John Smith
11/24/08	11/24/08	Site visit to the site	John Smith
11/25/08	11/25/08	Site visit to the site	John Smith
11/26/08	11/26/08	Site visit to the site	John Smith
11/27/08	11/27/08	Site visit to the site	John Smith
11/28/08	11/28/08	Site visit to the site	John Smith
11/29/08	11/29/08	Site visit to the site	John Smith
11/30/08	11/30/08	Site visit to the site	John Smith

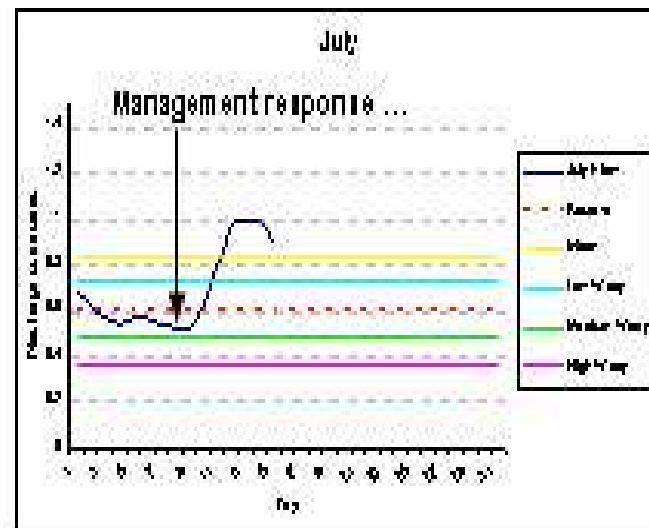


# 2009/2010

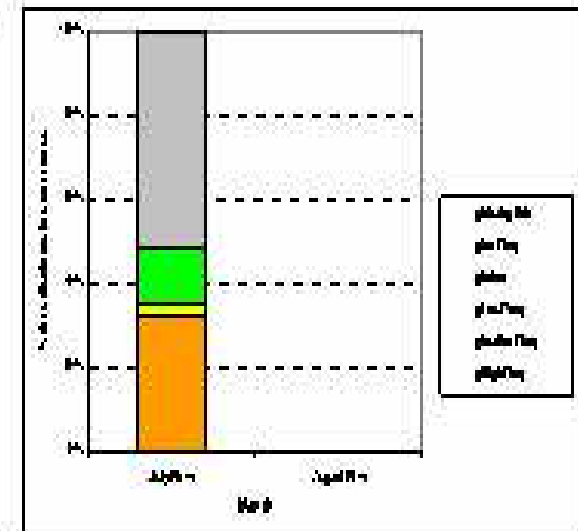
## Real-time Reserve Implementation – Letaba pilot



**SPATSIM Model**

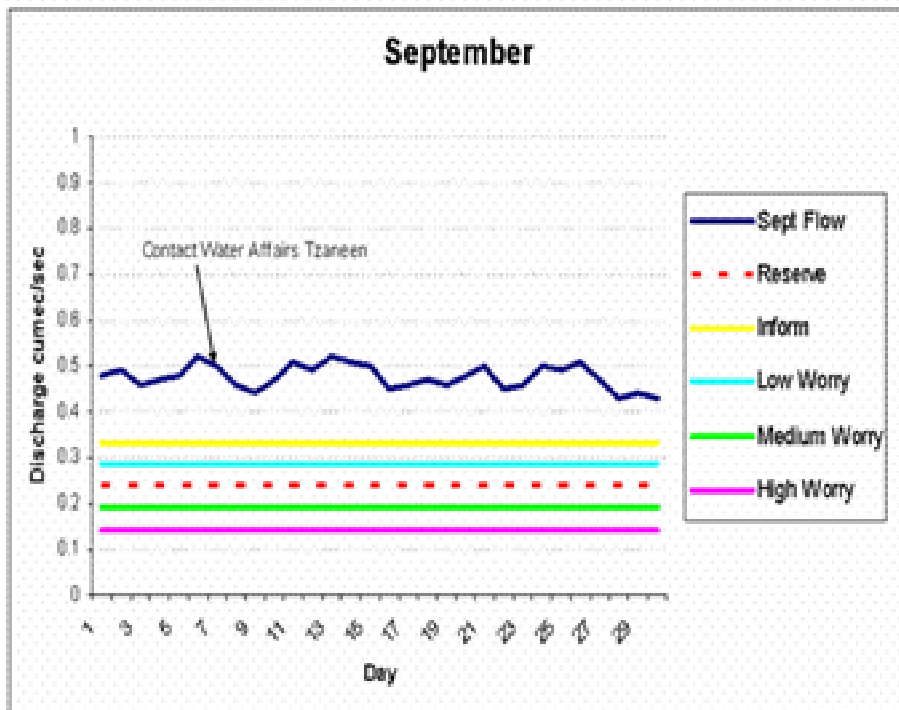


**KNP Graphical outputs as feedback**



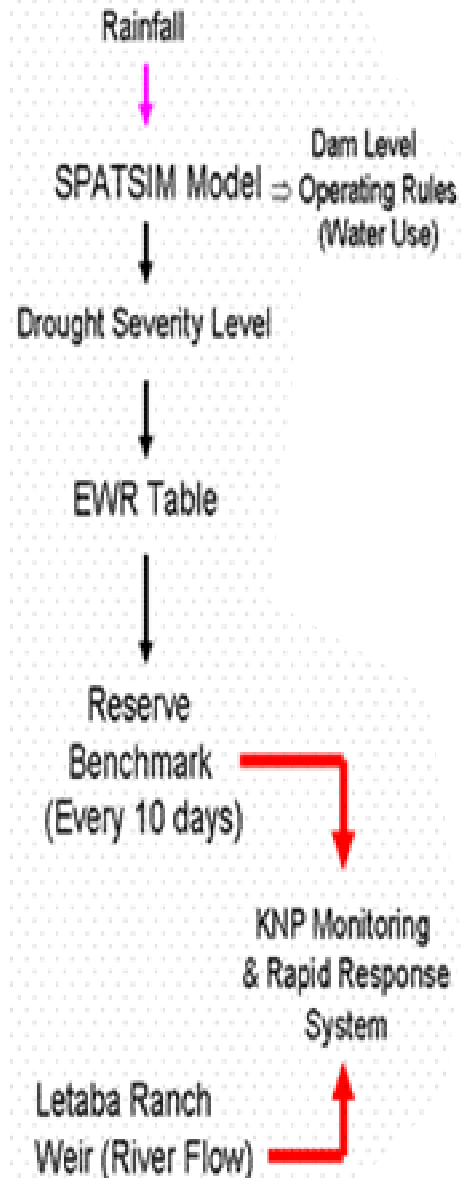
# Groot/Lower Letaba River

## Rapid Response System



Drought Severity Level: 20%

## Initial Operational Plan – Letaba River



**KNP Technician:** Letaba River flowing very low at 1.3 cumec, below Reserve. Is it possible to do something?

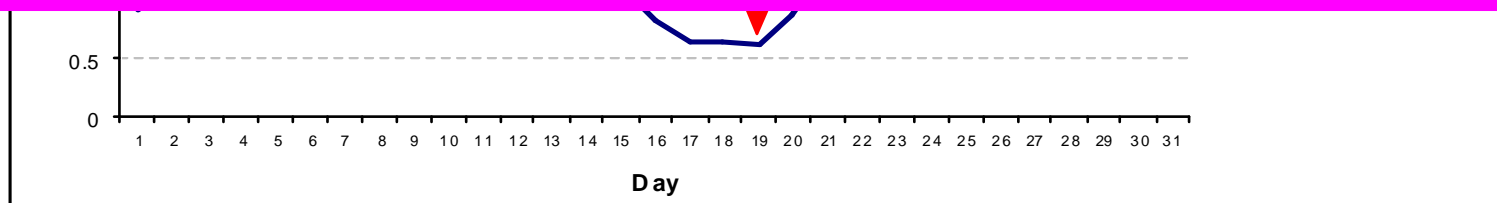
**Water Manager**

## Assessment, Reflection, Learning

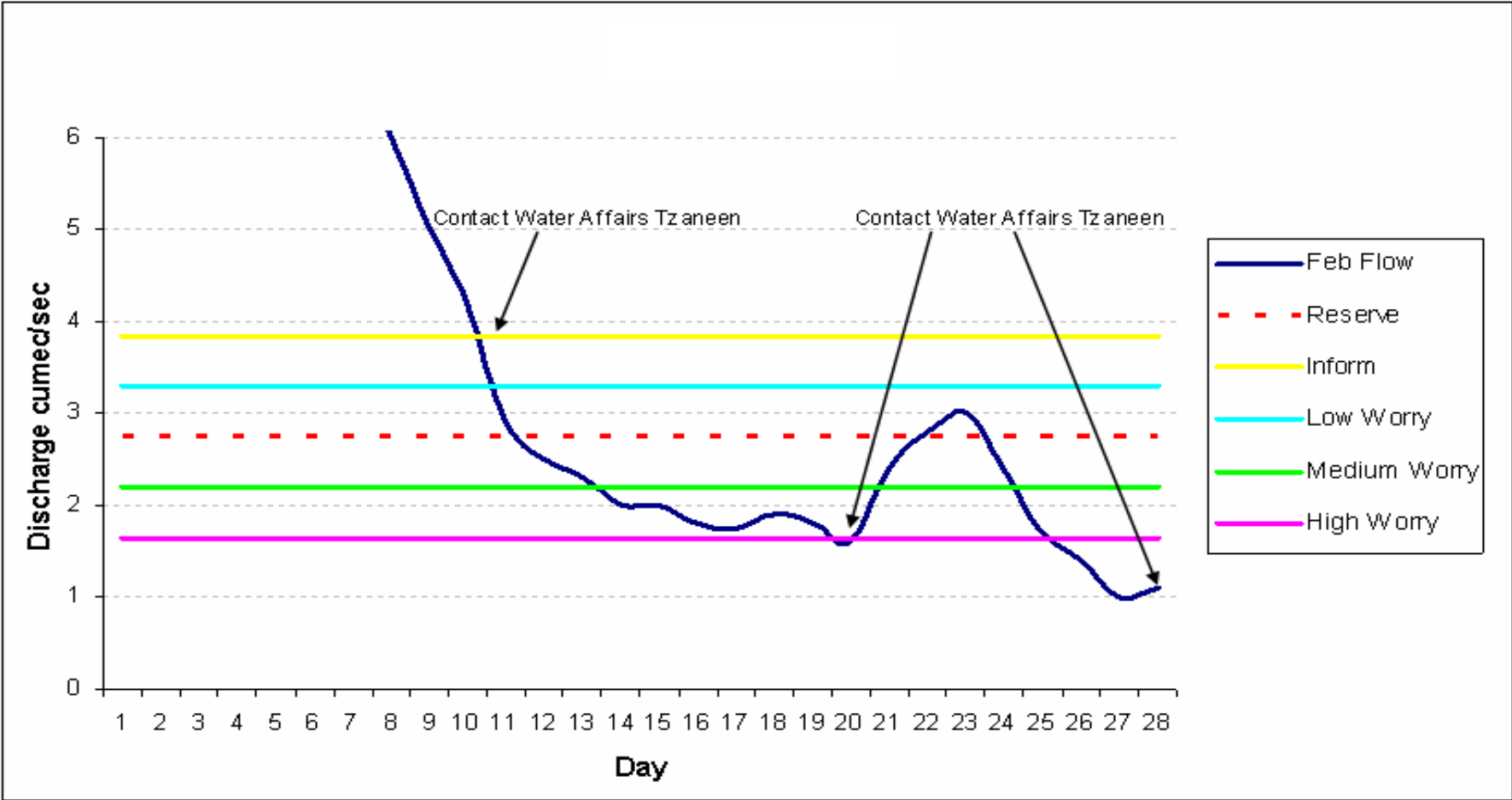
**Providing information - correct form, at right time  
(easier to interpret and make decisions)**

**Increased interaction/contact between KNP river staff**

**Adopted within broader catchment level assessments  
(case-studies)**

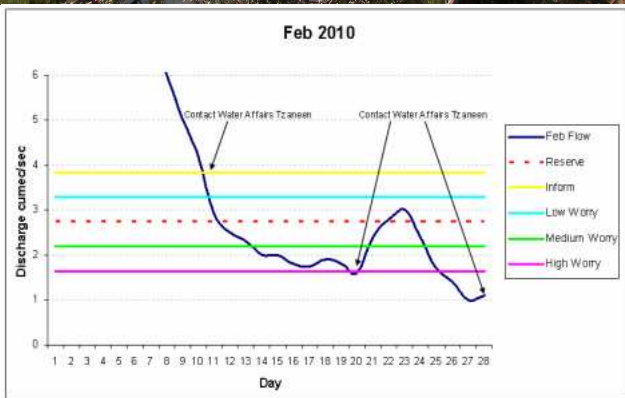


# February 2010



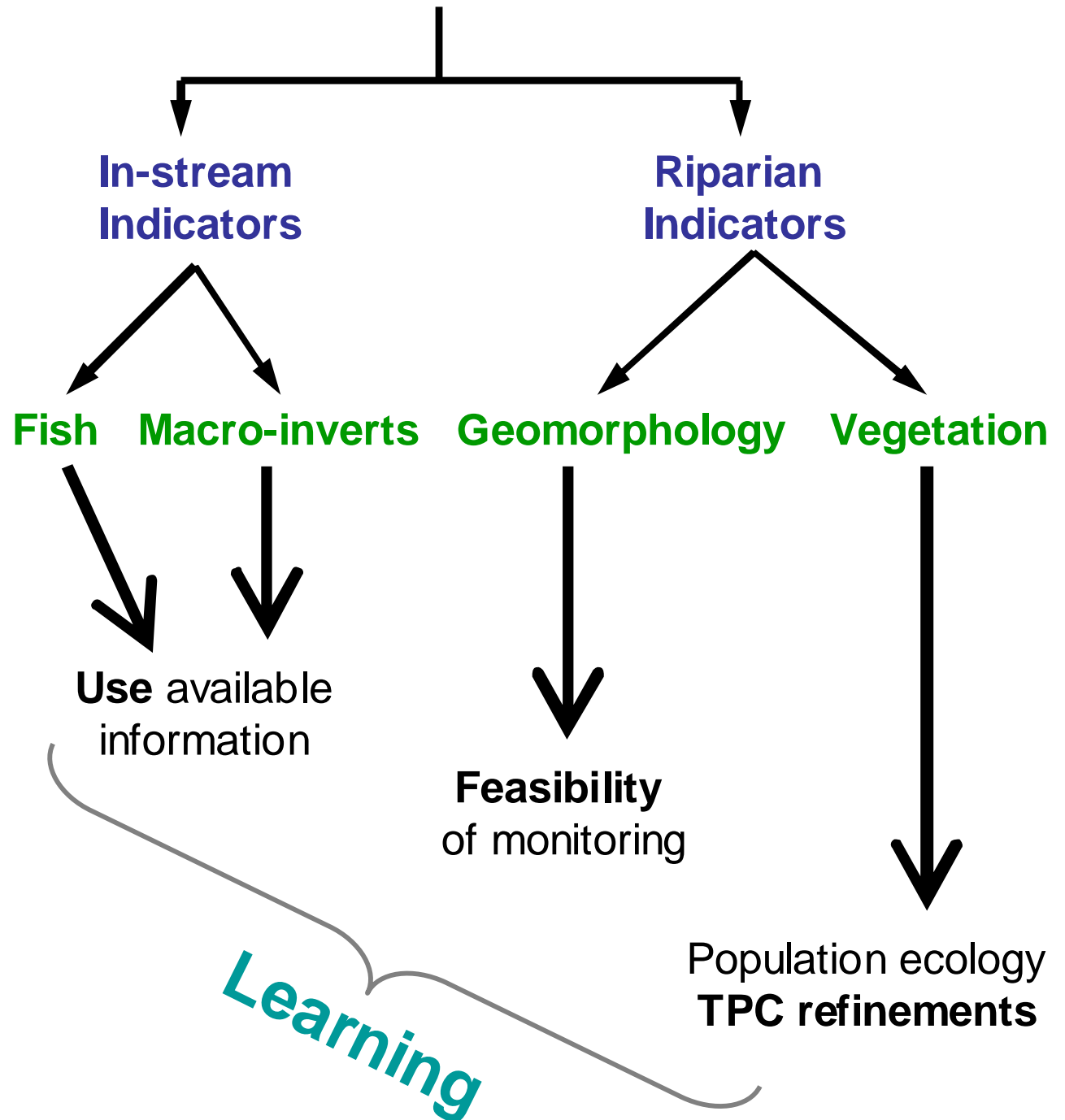
**Drought Severity Level: 62%**

# Biodiversity TPCs



Drought Severity Level: 62%

## Test Ecological Reserve



# Thank You



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