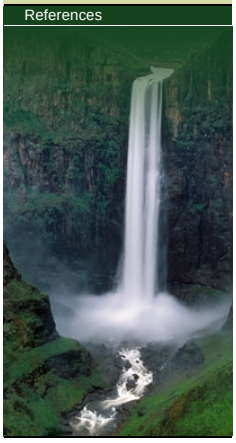

Aquatic Habitats

Rivers

Rivers and streams differ from other aquatic habitats in their physical characteristics (i.e., shape, substrate) and hydrology, which is dominated by flowing water and often varies seasonally. As in lakes or wetlands, habitats and biological communities in rivers vary with depth or distance from shore, and in response to seasonal changes in the environment. Significant shifts in habitats and biological communities also occur over the length of rivers, due to the changing influence of riparian vegetation on shading and organic matter inputs as the river width increases (Wetzel 2001).

The distribution of fish and other aquatic organisms in rivers and streams depends on the environmental conditions they prefer or require. Oxygen levels in streams are usually sufficient for fish, and temperatures are generally similar at the surface and the bottom. Other habitat features, however – stream substrate, current strength, water depth, aquatic vegetation, and the presence of undercut banks, pools, or woody debris – can vary over relatively small distances within a watercourse, providing a range of habitats for different species (Nelson and Paetz 1992).

The Senqu River flows from its source near Thabana Ntlenyana (at 3 482 metres, the tenth highest peak in Africa) in the Lesotho highlands, becomes the Orange River at the Lesotho border, traverses central and western South Africa, forms the southern border of Namibia, and finally joins the Atlantic Ocean near Alexander Bay. Along this 2 300 km journey, several major tributaries feed the main river, including the Vaal, Fish and Nossob rivers.

For a description of the hydrology of the Orange-Senqu River basin, please refer to the Hydrology chapter.

The Senqu River, Lesotho.
Source:Lesotho Water Commission 2008
(click to enlarge)

Wetlands

Wetlands are areas where the water table is at or near the surface, or where the land is covered by shallow water for long enough to result in water tolerant vegetation and altered soils (Environment Canada 2009). Wetlands are neither truly terrestrial nor truly aquatic, and are often transition zones linking land and water environments. The water table that creates a wetland can arise from a regular unconfined aquifer close to the surface, or from a perched aquifer – a region of saturated rock created by a localised body of impermeable rock.

Wetland characteristics are determined by climate, topography and landscape, soils and geology, hydrology, vegetation, and human interventions.

Wetlands in the Orange-Senqu River basin are distributed as shown in the map below.

Certain wetlands within the Orange-Senqu River basin are of particular interest due to geographic location, their importance to the hydrology or ecological integrity of the catchment:

- The wetlands of the Lesotho highlands, also known as sponges
- The Orange River Mouth

The wetlands of Lesotho are distributed throughout the upper reaches and tributaries of the Senqu River, including those on the Sani, Motete and Fanana Rivers.

An important delta-type wetland is located at the mouth of the Orange-Senqu River, where it occasionally meets the Atlantic Ocean, on the border of South Africa and Namibia. The Orange River Mouth was designated as a Ramsar site in 1992 because of its unique habitat. However, as a result of a number of factors – most significantly perturbations in natural flows from upstream dams, the ecological condition of the Orange River Mouth has already deteriorated and the South African portion of the wetland has recently been placed on the Ramsar Montreux Record, a status denoting a requirement for urgent action to be taken (ORASECOM 2007e).

For more information about the role of wetlands ecosystems, please refer to the Wetlands section of this chapter.

Lakes

Lakes are defined as permanent waterbodies greater than 0,25 ha in surface area and more than 2 m deep. Worldwide, lakes are the largest reserve of surface fresh water (Kalff 2002). Lakes vary in morphological features, such as depth, extent of shoreline, basin shape, and basin geology. They also vary in their surrounding vegetation, climate, and river inflows and outflows. These characteristics influence the physical and chemical environment of a lake, which in turn affects its biological characteristics. Habitats and the distribution of aquatic organisms can vary significantly even within a single lake, depending on water depth, dissolved oxygen levels and light penetration, distance from shore, and lake bottom substrate.

There are no natural lakes in the Orange-Senqu River basin, but the numerous dams provide aquatic habitats that to a large extent mimic those found in lakes – a large body of deeper water, with slow flow, temperature gradients and a different sediment and nutrient profile compared to rivers.

Not only is the Orange River Mouth wetland affected by reduced flow from ongoing management of the flow in the upstream section of the Orange-Senqu River, but it is subject to water and sediment discharges from industrial diamond mining activities on the north and south side of the river.

Estuaries

Estuaries form the interface between a river and the ocean and an estuary is always tidal: the water level fluctuates in response to the ocean tides. In the case of the Lower Orange River, because the outlet to the ocean is occasionally blocked by sand-bars it is not considered to be a true estuary but rather a river mouth (SAWCP 2009).

The Orange River Mouth, a designated Ramsar wetland.
Source:Agar 1998
(click to enlarge)

Wetlands of the Orange-Senqu River basin (limited data available for Lesotho).
Source:Hatfield 2009, after Ramsar 2009
(click to enlarge)

Next: Aquatic Ecosystems in the Orange-Senqu River Basin