2.3.3 HYDRO-ZONING

Hydro-zoning is a method of locating plants in accordance with a landscape’s differing levels of shading, evaporation rates and exposure to the local weather conditions. Ultimately, these factors effect the level of moisture in the soil. With this knowledge, ‘hydro-zones’ can be determined for the site, and plants can be matched with a suitable hydro-zone, according to their water use.

Generally, soil moisture will be higher during Brisbane’s summer wet season compared with the dry windy season between July and October. In addition, during periods of prolonged drought, soil moisture levels are lower compared with wetter years.

A tree or roofline may shade some areas of a development, or be protected from winds by a wall, so evaporation is less; other parts of the landscaping, for example around car parking areas, may be fully exposed to the sun and prone to drying out. Garden soils alongside paved areas often receive runoff and can be regularly damp or wet. Figure 4 provides examples of hydro-zones found in Brisbane landscapes.

---

**Hot and dry hydro-zone** – road-side garden bed with no shade and north aspect

**Cool, moist and shady hydro-zone** – bottom of hill slope with dense tree shade and south aspect

**Mild hydro-zone** – shaded and protected from winter wind by adjacent tall buildings. Alignment causes wind tunnelling and drying out in summer

---

*Figure 4: Hydro-zone examples in the Brisbane landscape*
Some plants enjoy well-drained soils that dry out regularly. Many Australian native shrubs and groundcovers, such as grevilleas, sheoaks and wattles, enjoy these conditions and are ideally suited to hot, dry and exposed sites. In extreme situations such as exposed roadsides and paved urban areas, designers may need to consider tougher plants such as banksias and hakeas.

Other plants enjoy well-drained soils that are consistently moist. Many exotic plants such as agapanthus, gardenias and cordylines enjoy these situations, as do local native plants such as hoveas, native daisies and cats whisksers. Where soils are regularly waterlogged, designers can choose plants that have adapted to wetland-type environments such as club rushes, irises, myrtles and tea trees.

Many Australian plants, including tea trees, bottle brushes, mat rushes and flax lilies, have adapted to highly changeable soil conditions. These are an ideal choice for areas of the landscape where the soil moisture regularly changes.

2.3.4 PLANTS AND STORMWATER MANAGEMENT

Plants can have a strong influence on catchment hydrology. The form of plants, their planting densities, the grouping of different plants, and irrigation of plants can affect evapotranspiration, infiltration and runoff rates. Table 1 summarises the impacts of vegetation on each hydrological process and identifies design aims for stormwater management.
Landscape Design Guidelines for Water Conservation

Table 1: Impact of vegetation on stormwater runoff

<table>
<thead>
<tr>
<th>Hydrological Processes</th>
<th>Impact of plants</th>
<th>Design aims</th>
</tr>
</thead>
</table>
| **Rainfall Interception:** The initial wetting of objects and the catchment surface. | • Vegetation can significantly increase the effective ‘wetted’ surface area of a catchment.  
• Most trees have a greater surface area per unit land area than most grasses.  
• Replacing bushland with grassland reduces rainfall losses and thus increases the total runoff volume and the potential pollutant runoff. | • Increasing planting density will reduce the impact of urbanisation on creek erosion and will reduce pollutant wash-off from the catchment.  
• Maximise the depth and extent of mulching.  
• Replacing porous pavements and areas of open soil with areas of vegetation will slow runoff, reduce runoff rates, volume, frequency and duration. |
| **Infiltration:** Percolation of rainwater into soil pores. | • Plants reduce the risk of the ‘surface sealing’ of soils, thus preventing soil surfaces becoming impervious - a condition that often occurs when clayey soils are cleared of vegetation.  
• Plant roots help to keep pores open, thus allowing rainwater infiltration.  
• Plants remove water from soil pores through transpiration  
• Deep-rooted plants lower groundwater levels thus increasing the infiltration capacity of soils. | • Using plants to increase the infiltration of rainwater will increase the percentage of stormwater that enters streams through springs and groundwater, thus increasing the quality and quantity of dry weather flows, therefore improving the general ecological health of the stream.  
• Vegetate all exposed soil surfaces, even if erosion of the soil surface is not obvious.  
• Maintain sheet flow conditions wherever practical to maximise rainwater infiltration. It is noted that the rate of infiltration greatly reduces once stormwater runoff becomes concentrated within drains. |
| **Depression storage:** The filling of minor surface irregularities. | • Vegetation can improve the subsurface drainage of minor surface irregularities (puddles) thus preventing conditions that may result in mosquito breeding. | • Where practical, maintain some degree of surface irregularities, especially in areas of sheet flow. |
| **Stormwater runoff:** The slowing down or detention of surface water as it builds the required flow depth necessary to push through groundcover vegetation, leaf litter and mulches. | • Prior to runoff occurring, the surface water must build-up sufficient water depth to allow the water to push through or over any surface roughness. Thick, homogeneous grass coverage can significantly increase the temporary detention (storage) of stormwater on the catchment surface.  
• Vegetation, leaf litter and mulches can significantly reduce the velocity of surface runoff thus increasing the response ‘time of the catchment and therefore reducing the peak runoff rate for a given storm event. | • Develop a continuous and even coverage of grass, mulch or groundcover vegetation that will help to maintain sheet flow conditions and delay the formation of concentrated flow. maintain sheet flow conditions and delay the formation of concentrated flow.  
• Use wide, shallow grassed drains rather than deep V-shaped drains.  
• Minimise the use of subsurface piped drainage. |