Chapter 6

Conclusion

Models reviewed in this work are applicable within an uncertainty range elaborated. Functionality of the three models applied is quite different from one another, but generate useful output.

1. Tennant model

    - The Tennant method delivers quick initial results.
    - Resulting flow recommendations for post-dam period are lower than for the pre-dam period
    - Flush floods are accounted for with Q=640 m^3/s for the post-dam period.
    - Optimum flows are estimated with Q$>$100 m^3/s for winter and Q$>$150 m^3/s for summer periods (post-dam period).

2. RVA model

    - The RVA model does not deliver numerical output but describes flow dynamics via a statistical approach.
    - IHA parameters allow to describe flow dynamics in much detail in terms of timing, frequency and flow magnitude.
    - RVA allows to determine whether a discharge time-series is altered by calculcating a hydrologic alteration value (HA).
    - Flow patterns between pre-impact and post-impact period have changed very little at Tortosa gauging station.
    - Although mean has changed generally spoken for IHA parameters, the HA is small due to large standard variation, which defines HA categories and category overlapping occurs for pre-impact post-impact period.

3. Phabsim model

    - The Phabsim model outputs the weighted usable area (WUA), which represents the physically available water surface for habitat.
    - Currently only curves for one species are available, which also still have to be validated.

- No substrate and temperature data is available for the reach.
- The Phabsim model is succeptible to errors in habitat curves.
- Optimum discharges for the chub are located around Q=50 m^3/s for adult/juvenile and spawning lifestages as well as below that for fry.
- Application of Phabsim in order to generate optimum flow calendars throughout the year is currently not possible due to lack of habitat curves.
- Physical habitat modeling can be combined with 2D (River2D) and 3D hydraulic models.
- 2/3D habitat modeling enables the precise local remodelation of river channel morphology in order to increase physically available habitat.