RHABSIM for inSTREAM...a 17-step program

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Data import:

1. Assemble field data in the format of a RHABSIM "Text X/Y/Vel" data file.
2. In RHABSIM, set the directory for importing and saving files: Convert > Setup > Import data file path, Convert > Setup > Output data file path
3. Import the file to RHABSIM: Convert > Import > Text X/Y/Vel data file
4. Tell RHABSIM that the units are metric: Convert > eDit > Units of measurement
5. Exit RHABSIM pathway.

Model water surface elevations:

6. Calculate measured flow at each transect: Hydsim > Edit > Stage/Discharge/SZF alt-C to calculate flow.
7. Check "stage of zero flow": Hydsim > Edit > Stage/Discharge/SZF. Check and manually edit "S.Z.F." for each transect. There are two options; the second is recommended:
    a. Make sure SZF is the highest of (i) SZF at previous transect and (ii) lowest elevation at current transect.
    b. Use alt-S to calculate the SZF producing the best regression of stage vs. discharge
8. Set the "calibration flows" (tell RHABSIM which flows to simulate; for now, only the ones with measured data): Hydsim > Edit > Calibration flows
9. Tell RHABSIM to use log-log regression of water surface levels (WSLs): Hydsim > WSLs > Select WSL methods. Use alt-S to set method for all transects.
10. View the regression of WSL vs. flow: Hydsim > WSLs > Calibrate WSLs. Select "log-log regression".
11. Turn on "dual SDR" so that RHABSIM does NOT adjust velocities so that calculated flow equals actual flow. Hydsim > WSLs > Calibrate WSLs > <D>ual SDR

Model velocities:

12. Tell RHABSIM what flows you want to model. This should be a limited range around the one flow you are using to calibrate velocities (which is set in step 3). At Hydsim > Edit > Calibration flows, type in the flows in ascending order.
13. Tell RHABSIM to use one-flow calibration for all transects. Hydsim > Vels > Parameters. Use alt-F to set "Method" value to 1 for all transects.
    HOWEVER: if you are using a calibration flow (see Step 3) for which you measured only water surface level, not velocity, choose method 3 (Depth calibration). For depth calibration, also go back to Hydsim > WSLs > Calibrate WSLs > <D>ual SDR to turn "Dual SDR" to OFF.
14. Also in Hydsim > Vels > Parameters select the calibration flow that you want to use. This is one of the sets of measured velocities (or WSLs) that you provided in your input file; its flow should be within the range of simulated flows selected at step 1. Use alt-F to set the "VelSet" column to the desired set of measured velocities.
15. View and potentially calibrate velocities for each cell. Hydsim > Vels > Roughness worksheet. Use alt-X to select each transect, alt-G to view the observed and simulated velocities. Adjust "roughness" (N) factors for cells if necessary: enter a new N value in the "Given N" column, then use alt-R to recalculate velocities.
16. Save results in the file used by inSTREAM: Hydsim > Vels > View vels. Provide a file name, select options to save all transects, select "No" for "Include cell ManN and regression…", and choose "<C> Centered for how velocities are reported.
17. Repeat these steps for each range of flows around each calibration flow.