Responses to RASTF Data Analysis requests

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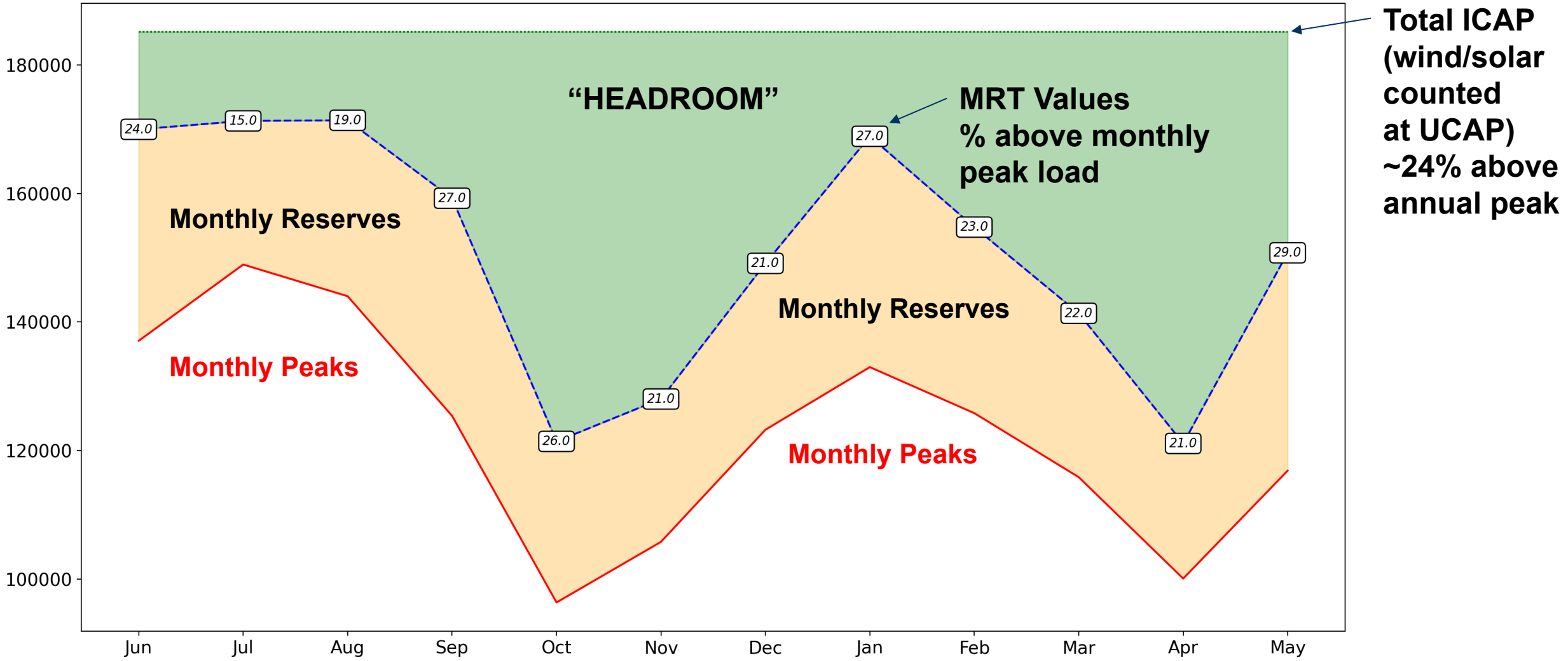
Estimates of “Headroom” under an Annual RPM Construct

- Headroom could be calculated based on Monthly Reserve Targets (MRTs).
  - Headroom refers to the outage MWs that PJM could potentially accommodate based on a reliability criteria
  - MRTs are only calculated for illustrative purposes for this presentation
- MRTs are calculated using a methodology similar to the Winter Weekly Reserve Target methodology but applied to each month of the year
- Two LOLE threshold levels were used to estimate the “Monthly Reserve Targets”
  - 0.001 days/year (currently used in WWRT procedure)
  - 0.01 days/year

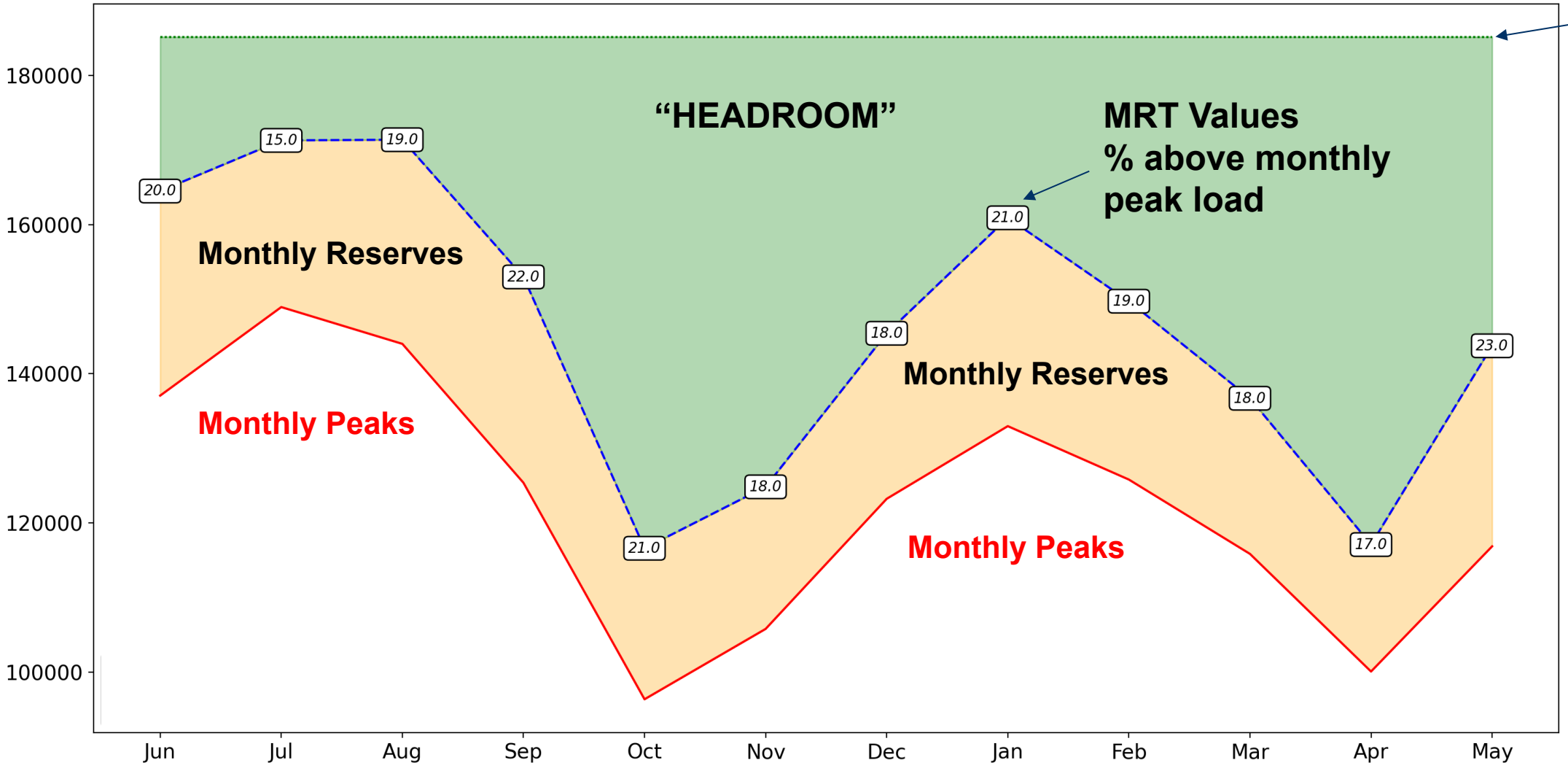
Monthly Reserve Targets (MRT) methodology

- Procedure
  - Step 1: Set up an IRM case with total LOLE = 0.1 days/year.
  - Step 2: In addition to the required planned outage schedule, simulate additional planned outages during each week of the year **until the weekly LOLE is the threshold level**.
    - If the weekly LOLE is already greater than the threshold level, do not model any planned outages in that week.
  - Step 3: Calculate the available reserves in each of the weeks as a percentage of the corresponding monthly peak.
  - Step 4: The MRT for each month is the highest weekly reserve percentage (rounded up to the next integer value).

2022/23 DY MRT values using 0.001 days/year threshold



2022/23 DY MRT values using 0.01 days/year threshold



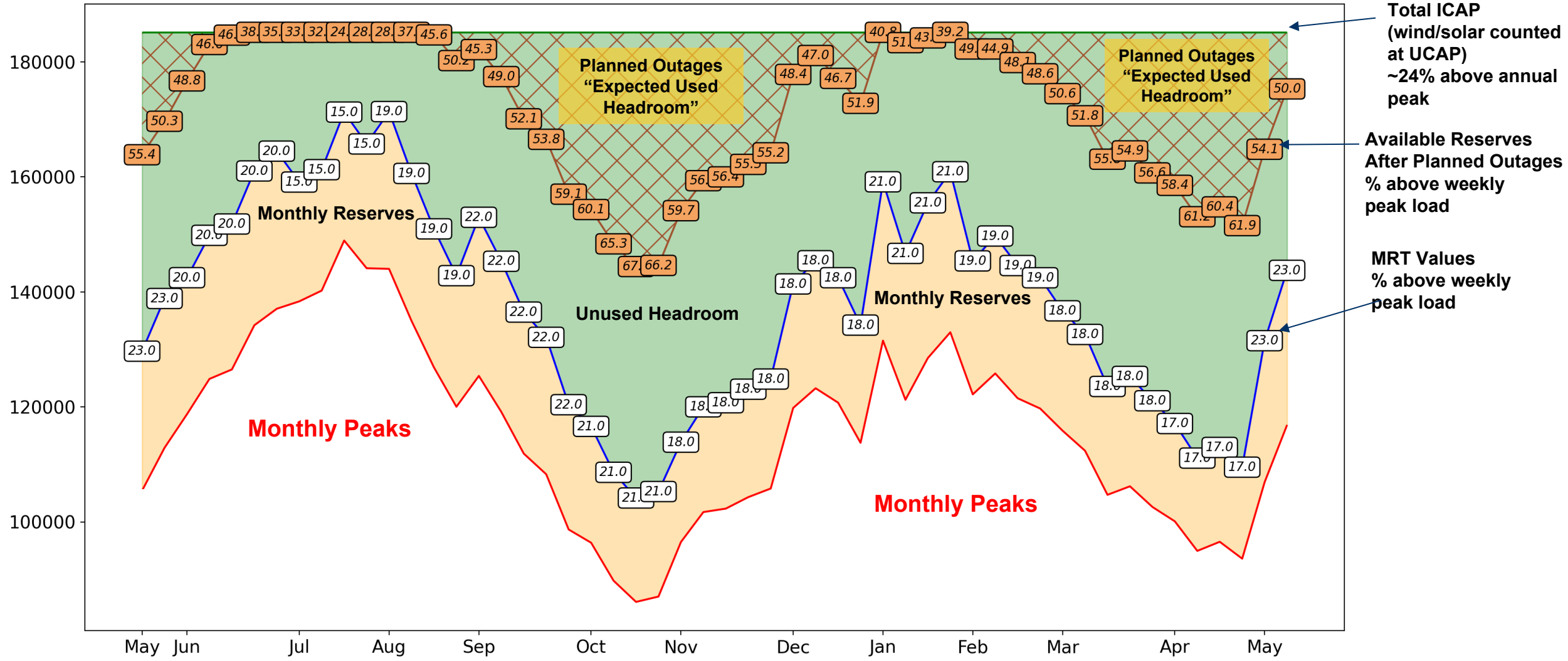
How much of the Headroom is expected to be used?

- An estimate of the Headroom expected to be used can be derived by using
  - Planned outage requirement data for delivery year 2022/23 from the 2022 RRS
  - Planned outage schedule derived by levelizing reserves
- The “expected used headroom” is derived for
  - An annual construct using actual reserves and 1-in-10 reserves
  - A 2-season seasonal construct using 1-in-10 reserves
  - A 3-season seasonal construct using 1-in-10 reserves

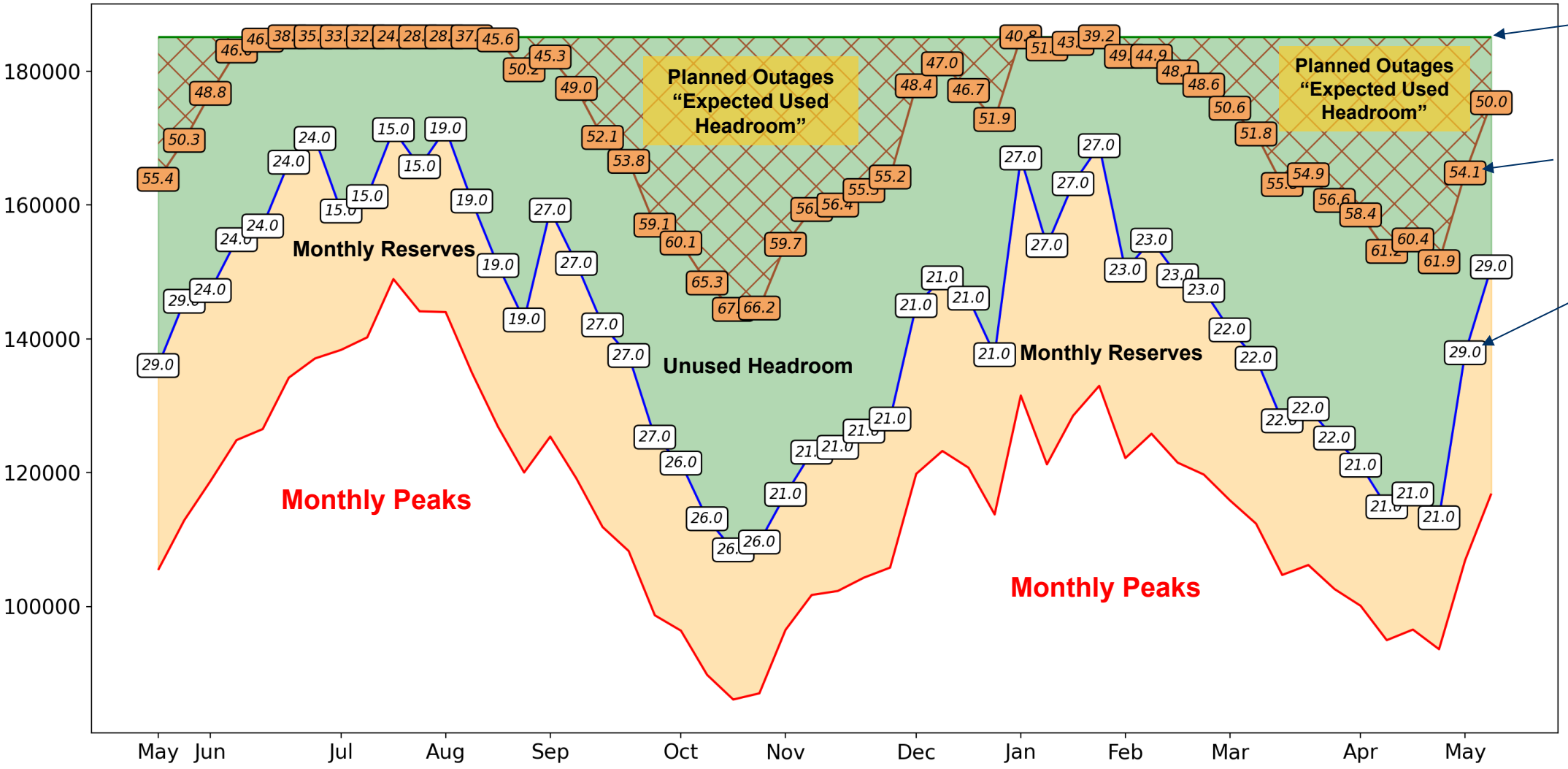
Caveats

- Planned outage requirement, forced outage rates taken from the 2022 RRS based on actual fleet for delivery year 2022/23
- Load uncertainty taken from the 2022 RRS for delivery year 2022/23
- RTO-wide planned outage requirement and schedule is kept constant in the 1- in-10 reserve scenarios and different seasonal design scenarios

Expected Used Headroom – Annual Construct – Actual Reserves – 0.01 days/year threshold



Expected Used Headroom – Annual Construct – Actual Reserves – 0.001 days/year threshold

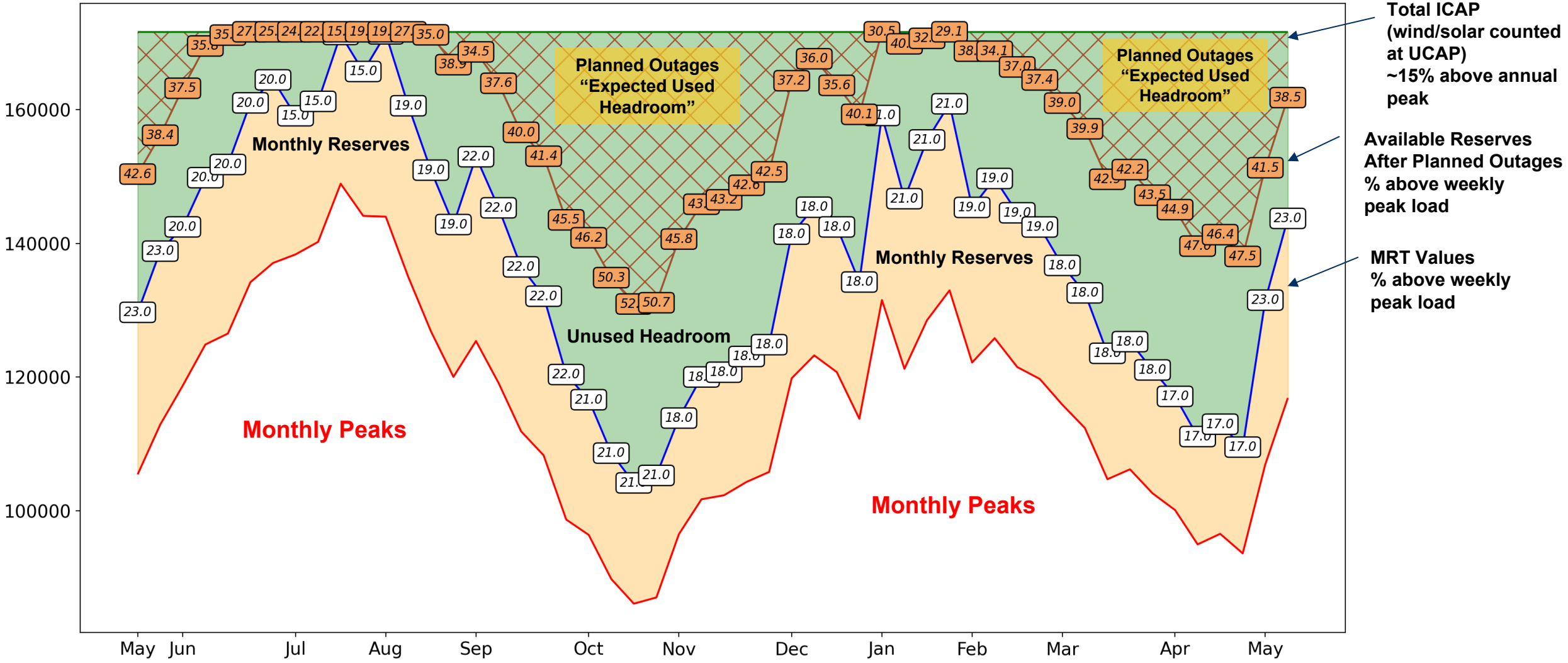


Total ICAP (wind/solar counted at UCAP) ~24% above annual peak

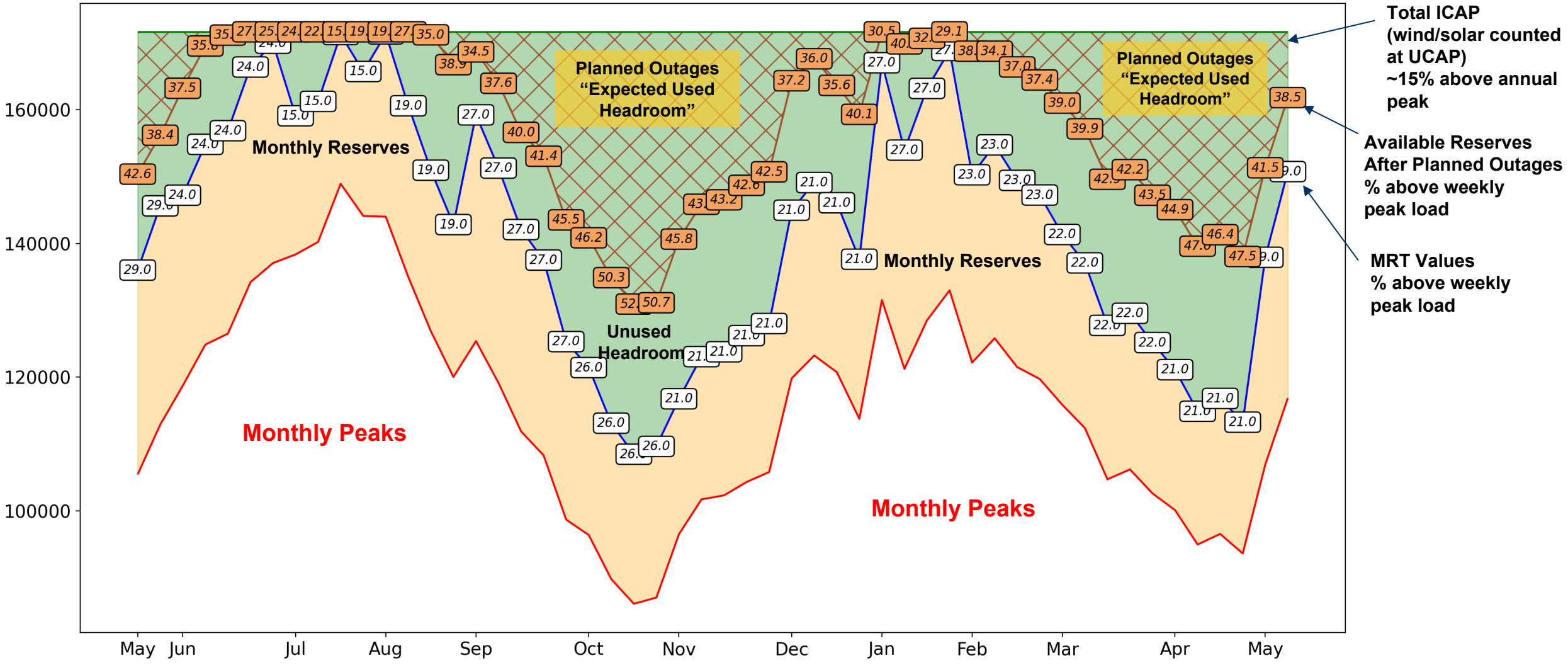
Available Reserves After Planned Outages % above weekly peak load

MRT Values % above weekly peak load

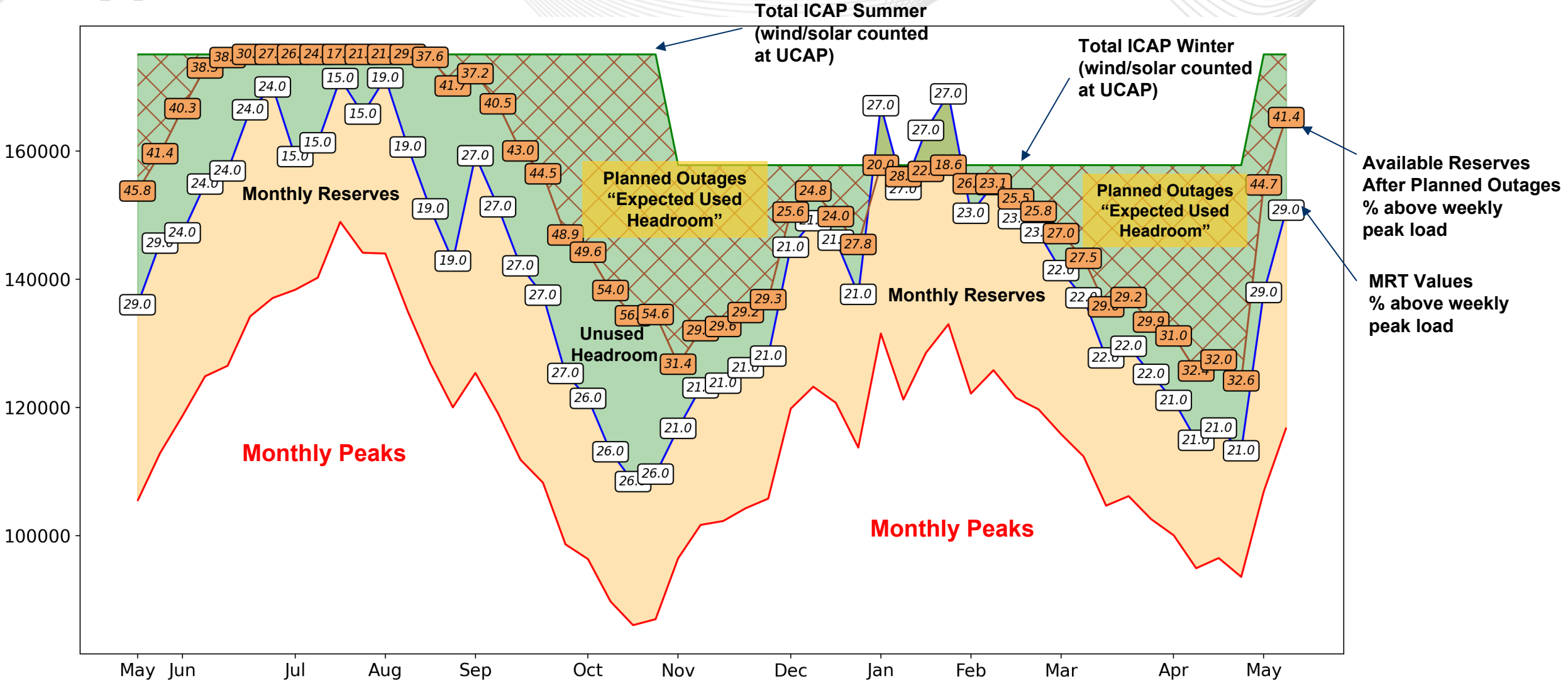
Expected Used Headroom – Annual Construct – 1in10 Reserves – 0.01 days/year threshold



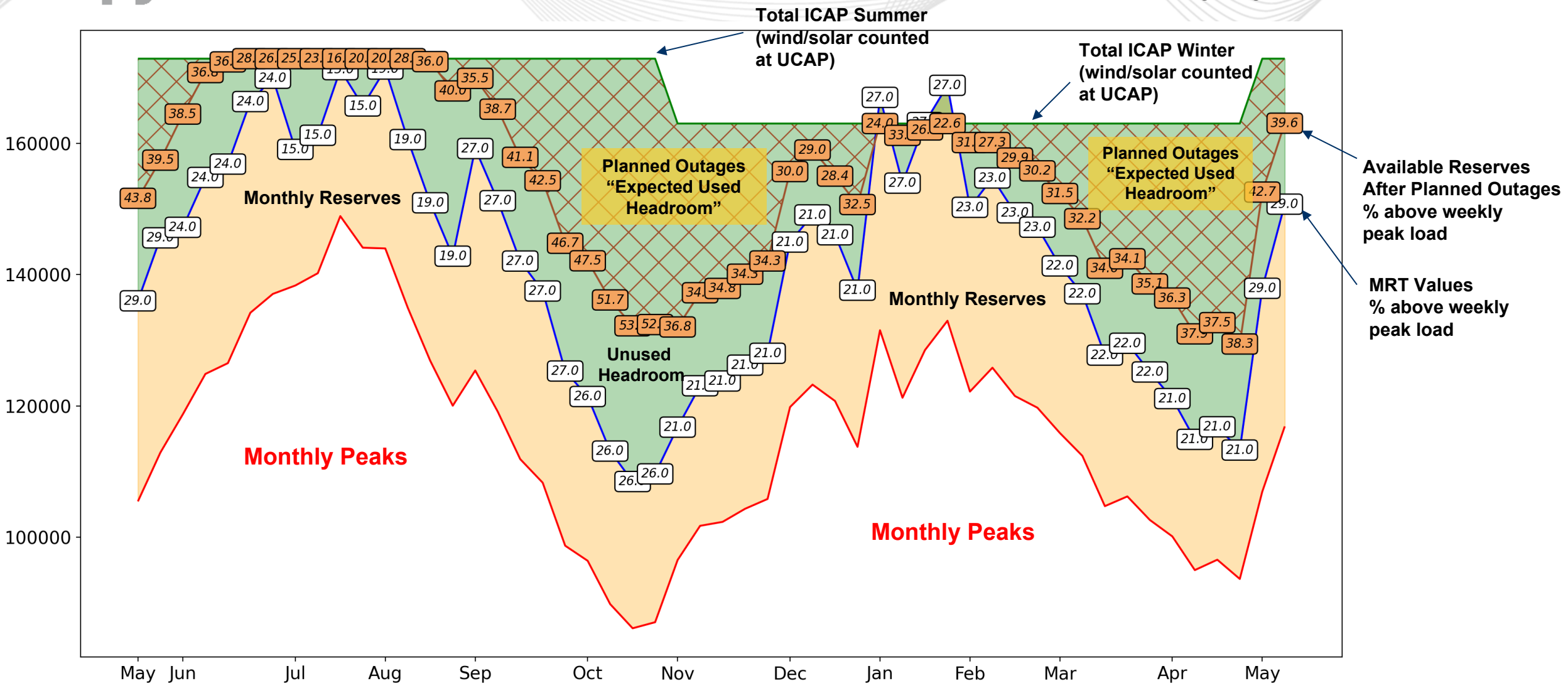
Expected Used Headroom – Annual Construct – 1in10 Reserves – 0.001 days/year threshold



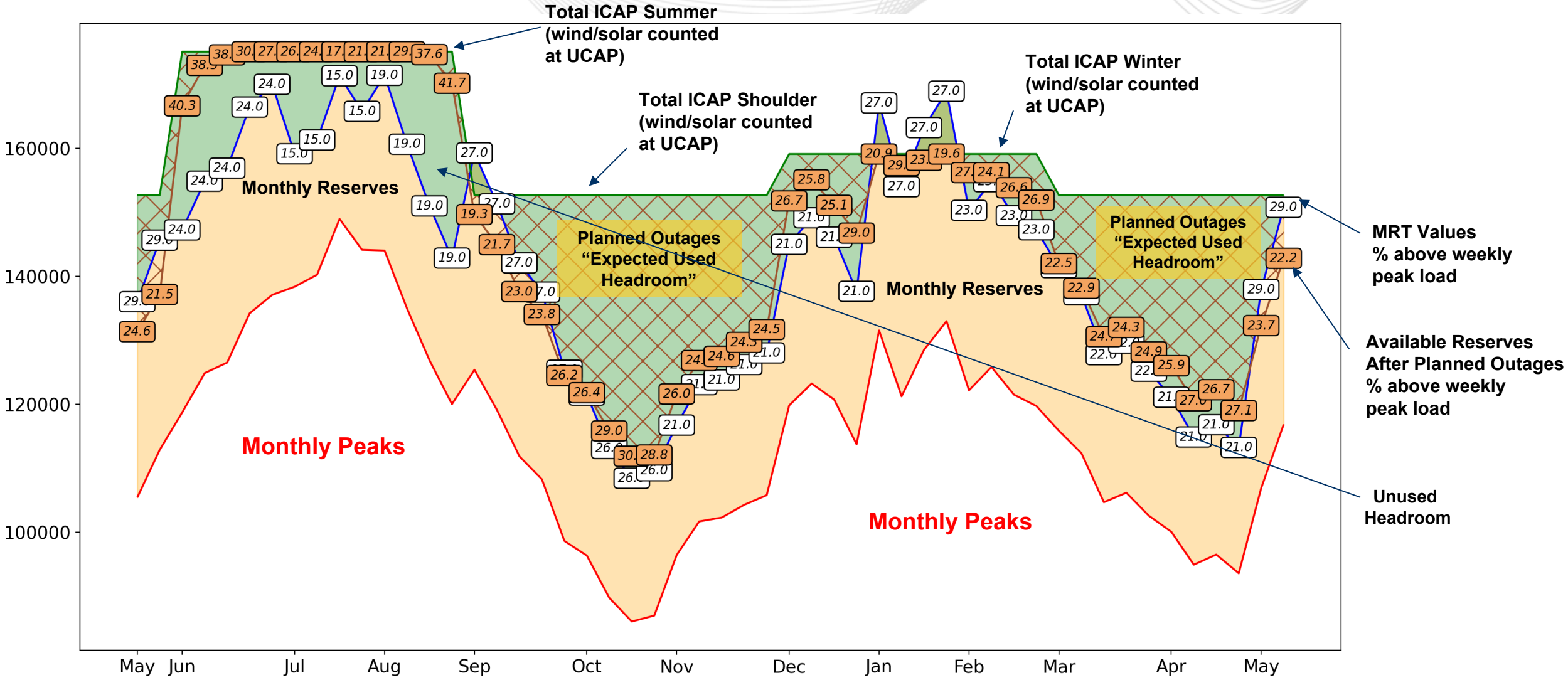
Expected Used Headroom – 2-Season Construct – 50/50 Summer/Winter LOLE Allocation - 1in10 Reserves – 0.001 days/year threshold



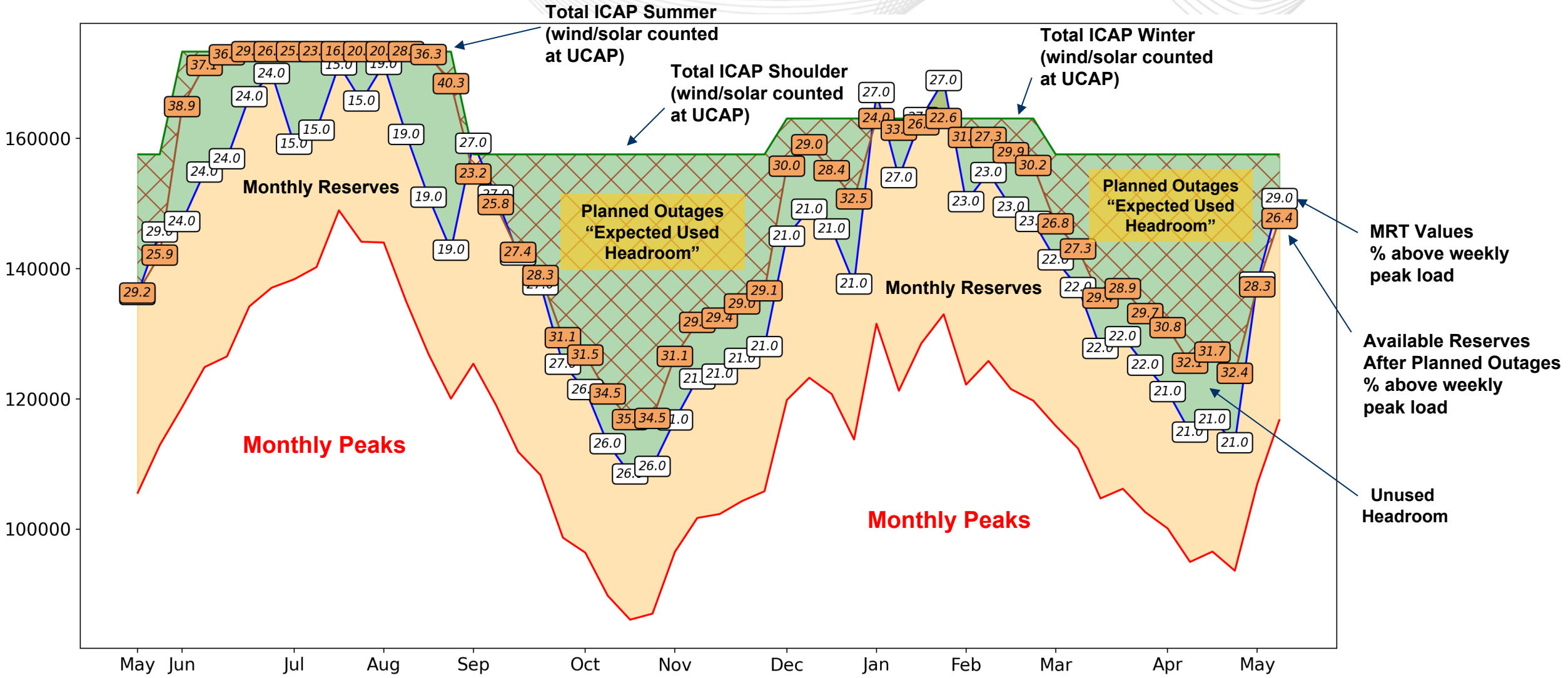
Expected Used Headroom – 2-Season Construct – 90/10 Summer/Winter
LOLE Allocation - 1in10 Reserves – 0.001 days/year threshold



Expected Used Headroom – 3-Season Construct – 33/33/33 Summer/Winter/Shoulder LOLE Allocation - 1in10 Reserves – 0.001 days/year threshold



Expected Used Headroom – 3-Season Construct – 33/33/33 Summer/Winter/Shoulder LOLE Allocation - 1in10 Reserves – 0.001 days/year threshold



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