CONDITIONS FOR DETERMINING ACCEPTABLE PRESCRIPTION PARAMETERS FOR PRESCRIBED BURNING AT J. CLARK SALYER NWR:

Extensive fuel loading occurs on some areas of the J. Clark Salyer Complex that have not had a series of renovation prescribed burns. These areas are composed of a variety of fuels including aspen parkland, mixed grass prairie with a variety of fine woody material, predominantly western snowberry averaging 2-3 feet high, and areas invaded with cool season exotic grasses including smooth bromegrass, mats of Kentucky bluegrass litter, and a variety of species of cool and warm seasons natives and intermixed forbs. Areas not dominated by woody plants have continuous dense mats of grass and forb litter that will continue the spread of fire. There is no standard fuel model that matches the mixed grass/brush fuel type commonly found on Refuge grasslands. Fuel model 5 is closest, but lacks the fine fuel of grasses in the understory.

J. Clark Salyer NWR conducts prescribed burns for a variety of reasons depending upon the unit. Burn windows are present basically from snow melt in the spring to snowfall in the autumn. Vegetation stages vary from fully cured in the early spring to increasing greenness until early June, when fuels are in a fully green state, then decreasing amounts of green (woody, grass, and forbs) depending upon moisture regime until fully cured again in the fall. **The predicted rate-of-spread and flame length will be close to that predicted in Fuel Model 1, 3 and 5 (based on experience) when there is no green present and fuels are fully cured. The Behave model predicts dead fuel moisture only and does not account for greenness factor thus will tend to significantly over predict fire behavior indices when green fuels are present.**

Also to be noted is that the wind speed correction factor of 0.4 does not seem to accurately predict midflame winds for the terrain and fuel type of the mixed grass prairie. The factor is too low based on local observations and appears to be closer to 0.7, which is the standard correction factor we use at J. Clark Salyer.

There is a degree of "art" involved in prescribed burning, allowing the use of varying degrees of the parameters based on their relationships: e.g., the cooler the temperature with higher relative humidities, the upper wind limits will be used; high temperatures with low relative humidities, the lower wind limits will be used; the more green showing, upper limits of all parameters could be used safely.

Behave runs for fuel model 3 typically provide fire behavior indices in excess of what is considered acceptable for control even at low wind and high fuel moisture conditions. Since fuel model 3 is represented almost entirely by marsh fringe and emergent vegetation around small wetlands and adjacent to large river and marsh systems, these fuels are generally not a concern to holding. **Rate of spread, fire intensity and flame length conditions outlined in the prescription table refer to indices acceptable along the perimeter of the burn where control is required. These indices may be higher within the unit where control is not a factor and still remain within prescription.** Perimeter holding lines where the ignition patterns include head fire off the line heading into the interior of the burn may also have heightened indices as these areas do not require significant holding efforts as the fire is burning away from the line towards the interior of the unit.

Adjacent land use also plays a major role in acceptable prescription parameters. Cropland in a tilled state or heavily grazed pasture may be burned with higher fire behavior indices due to the ease of holding in these areas based upon lack of fuel. Areas with CRP, cured crop, or heavy pasture will require significantly more holding forces and will be burned with lower prescription limitations.

Prescribed burning at J. Clark Salyer on days with a low RH below 25% and/or low fuel moistures below 5% will only be allowed when there is a minimum of 20% green fuels in the fuel bed. No burning will be conducted when relative humidities drop below 20% or fuel moistures drop below 4%.