

Summary of Findings:

The fuel models used are from the National Wildfire Coordinating Group (NWCG) official publication of the Standard Fire Behavior Fuel Models¹: These forty models are standardized nationwide. These models are categorized by Grass Fuel Models, Shrub Fuel Models, Timber Fuel Models, Slash Fuel Models and Non-Burnable Fuel Models. Of these models six Grass models, three Shrub models, four Timber models and four “Non-Burnable Models” were found in the FMLT parcels. That included a custom “Non-Burnable” model that was added to represent Willow Swamp / Pepperbush Swamp / Vineland and Shrubland thickets that are present in many Ferguson Museum Land Trust (FMLT) parcels.

These models include several models that are listed as Dynamic. This term describes that fuels will burn differently (or won’t burn) during different seasons; simply put, changes with seasons. An example of this on Fishers Island is the Middle Farms Flats grasslands. In mid to late spring dormant grass fuels are very capable of burning. By the end of May, however, these grasslands are in full vigor and are too green to burn. The “dynamic” fuels are labeled as such in the national set of Scott and Burgan models.

What is noteworthy here, however, is that several additional fuel models found in the FMLT parcels may also be dynamic due to presence of invasive plants. A commonly occurring fuel model here is Moderate Load, Humid Climate Shrub – SH3. On Fishers Island this shrub component is mostly made up of varieties of Honeysuckle and other invasives. SH3 is not a “dynamic” fuel model by definition, however it is felt that these will not burn when it is in the full vigor of summer / early fall, but will burn when it is in dormant stage in fall, winter and spring. Hence locally SH3 becomes a “dynamic” fuel model for us.

Most of the fuels in the FMLT parcels that were labeled as high potential wildfire risk include the vegetation group labeled as Maritime Scrub/Shrub. This is usually found in narrow bands upslope from beaches, on top of or on slopes of seaside bluffs or in steep, narrow ravines leading upslope from seaside beaches. It is a bit of a quandary deciding how likely it is that these Maritime Scrub/Shrub patches will burn in wildfire. First off, let it be said that anything organic can and will burn under extreme conditions. These scrub/shrub patches have plants in them that do burn readily; oaks, cherry, saltbush, poison ivy and others. But in interviews with local Fishers Island Fire Department Chiefs they have no history of burning here. I also interviewed multiple long term New England wildfire/prescribed fire experts. All said that these fuels were unlikely to burn unless under severe drought and with fire conditions (wind, sun, slope, temperature) in total perfect alignment. Research on the US Forest Service Fire Effects Information System indicated these “maritime scrub/shrub” forests were very long fire return interval ecosystem; 200 plus years between fires. So maybe that’s why nobody remembers them burning; our lifetimes are too short for this long fire return interval. But “maritime scrub/shrub” burned in the great fires in Maine in the early 19th century. I think that is what is here in Fishers Island and most of the NE US shorelines right now. They won’t burn very often, but one day they will burn. And then it will be centuries before they burn again.

¹ Standard Fire Behavior Fuel Models: A Comprehensive Set for Use with Rothermel’s Surface Fire Spread Model; 2005; Joe H. Scott and Robert E. Burgan; USDA Forest Service Gen. Tech. Rep. RMRS-GTR-153. 2005.

The following fuel models were found within the FMLT parcels:

FUEL MODEL	FUEL NAME	DESCRIPTION / CHARACTERISTICS
GR3	Low Load, Very Coarse, Humid Climate Grass (Dynamic)	The primary carrier of fire in GR3 is continuous, coarse, humid-climate grass. Grass and herb fuel load is relatively light; fuel bed depth is about 2 feet. This is the most common grass model found outside of the Middle Farm Flats grasslands in the FMLT parcels. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GR6	Moderate Load, Humid Climate Grass (Dynamic)	The primary carrier of fire in GR6 is continuous humid-climate grass. This grass model makes up most of the eastern portion of the Middle Farm grasslands. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GR8	High Load, Very Coarse, Humid Climate Grass (Dynamic)	In the FMLT parcels this model consists solely of Phragmites Reed Grass in marshes and pond margins. The primary carrier of fire in GR8 is continuous, very coarse, humid-climate grass. Load and depth are greater than GR6. Spread rate and flame length can be extreme if grass is fully cured. This is a seasonally dynamic model that will not burn when fully green (June-September).
GS2	Moderate Load, Dry Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS2 is grass and shrubs combined. Shrubs are 1 to 3 feet high, grass load is moderate. Spread rate is high; flame length moderate. In this study this model is only used for Salt Marsh and Salt Scrub habitats. Although a “dry climate” model, it was chosen as best match for these habitats in fuel loading / composition / continuity. This is a seasonally dynamic model that will not burn when fully green (June-September).
GS3	Moderate Load, Humid Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS3 is grass and shrubs combined. Moderate grass/shrub load, average grass/shrub depth less than 2 feet. Spread rate is high; flame length moderate. Moisture of extinction is high. This model is only found in the Middle Farm Flats grasslands with Sumac being the primary shrub. This is a seasonally dynamic model that will not burn when fully green (generally mid –May through September).
GS4	High Load, Humid Climate Grass-Shrub (Dynamic)	The primary carrier of fire in GS4 is grass and shrubs combined. Heavy grass/shrub load, depth greater than 2 feet. Spread rate high; flame length very high. This model was only found in a portion of the grassland in F54. This is a seasonally dynamic model that will not burn when fully green (June-September).
SH3	Moderate Load, Humid Climate Shrub	The primary carrier of fire in SH3 is woody shrubs and shrub litter. Moderate shrub load, possibly with pine / hardwood overstory or herbaceous fuel, fuel bed depth 2 to 3 feet. Spread rate is low; flame length low. This was a pretty common model in this study and was chosen to for numerous woodlands that are invaded by non-native shrubs and vines as an understory. Fire behavior is likely over-predicated by using this model, due to fire resistance of these non-natives. Although not listed as a “dynamic” model higher flame lengths and rates of spread may occur when these shrubs are dormant and the vines/shrubs now become available to burn.
SH4	Low Load, Humid Climate Timber-Shrub	The primary carrier of fire in SH4 is woody shrubs and shrub litter. Low to moderate shrub and litter load, possibly with pine overstory, fuel bed depth about 3 feet. Spread rate is high; flame length moderate. This model was selected in this study for sites that had higher fuel loading than SH3. Fire behavior is likely over-predicated in the FMLT parcel by using this model, due to resistance to fire of these non-natives. Although not listed as a “dynamic” model higher flame lengths and rates of spread may occur when these vines/shrubs are dormant and available to burn.
SH6	Low Load, Humid Climate Shrub	The primary carrier of fire in SH6 is woody shrubs and shrub litter. Dense shrubs, little or no herbaceous fuel, fuelbed depth about 2 feet. Spread rate is high; flame length high. This model was chosen in this study to represent areas of Maritime Shrub / Maritime Scrub which were mostly dense shrub patches of invasive Japanese Rose mixed with buckthorn, honeysuckle and some oak and cherry. SH6 is usually a hot burning, fast moving fuel model. In this case it is felt that these scrub patches will only burn under extremely dry conditions with strong winds in upslope alignment. ² This

² Interviews conducted with a variety of experienced Northeastern US wildland fire managers indicated that Maritime Shrub/Scrub patches were reluctant to burn unless driven by strong alignment with winds / fuels / slope and dry conditions. Ken Edwards, lifelong resident and former Fire Chief of the Fishers Island Fire Department, said he had never witnessed this Maritime Shrub/Scrub habitat burn. The US Forest Service Fire Effects Information System listed this habitat as a “stand replacement” ecotone with a fire return interval of 200 plus years (meaning it was expected to burn severely only once in a 200 year cycle).

		model was also used in some instances with very high shrub fuel loading other than Maritime Shrub/Scrub.
TL2	Low Load Broadleaf Litter	The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low. This model was found very infrequently in this study.
TL4	Small downed logs	This model was found only on one property Easement 06, where some timber had been cut for vista management and left on the ground. The primary carrier of fire in TL4 is moderate load of fine litter and coarse fuels. Includes small diameter downed logs and branches. Spread rate is low; flame length low.
TU2	Moderate Load, Humid Climate Timber-Shrub	This is the most prevalent fuel model found in this study, which is not unusual as it is a very common northeastern hardwood fuel model. The primary carrier of fire in TU2 is moderate litter load with shrub component. High moisture of extinction. Spread rate is moderate; flame length low.
TU3	Moderate Load, Humid Climate Timber-Grass-Shrub (Dynamic)	This model was found in only 3 sites in this study. The primary carrier of fire in TU3 is moderate forest litter with grass and shrub components. Extinction moisture is high. Spread rate is high; flame length moderate.
NB1	Non-burnable Urban/ Suburban areas with Grass Lawns.	Will not burn except during extreme drought. For grass lawn to carry fire it must be completely desiccated and dry. Grass lawns are used to create defensible space around structures in urban / suburban and rural settings.
NB3	Non-burnable Agriculture	Will not burn if maintained under agricultural use. The only site designated with this model is a small portion of the Ferguson Museum grounds F01.
NB4	Non-burnable Swamp / Marsh / Vineland	Will not burn except during extreme drought. This is not one of the "standard" 40 models, but was added to use in this study. This model reflects areas that will not carry fire except under extremely persistent dry conditions. These are generally willow and/or pepperbush marshes and vinelands often with standing water at the surface. Under almost all conditions these fuels would represent natural firebreaks for wildfires.
NB8	Nonburnable Lake / Open Water	Will not burn
NB9	Nonburnable Beach / Rock	Will not burn due to exposed rock / sand / gravel and extremely sparse fuels.

Table 1 Fuel Model Codes, Name and Description

Fuels and Risks by Contiguous Parcel Listing

The following are wildfire risk findings and maps listed using Contiguous Parcel groupings. Each page has a description of the fuels and risks, displays a map of the group of parcels, and has a table showing the relative wildfire risk for each parcel and a table of the fuel models present in this group of parcels.

The values of the wildfire risk ratings per parcel are coded as follows in Table 2

WILDFIRE RISK RATINGS		
<i>Table 2 Wildfire Risk Ratings</i>		
LOW	LOW	Surface fires with low flame lengths, moderate rate of spread and no spotting. Fires pose little or no threats to directly adjacent properties.
MODERATE	MODERATE	Surface fires with moderate flame lengths, moderate rate of spread & minimal spotting. Fires pose a minor threat to directly adjacent woodlands/grasslands or directly adjacent buildings and are easily protected.
HIGH	HIGH	Surface fires with high flame length (8' or more), high rate of spread (300'/hour or more). Sustained fire in the shrub layer with single tree torching. Spotting 20' or more. Threats exist only to immediately adjacent properties.
VERY HIGH	VERY HIGH	Surface fires with group torching, flame length very high, rate of spread very high and spotting 200' or more. Threats exist to adjacent properties.
EXTREME	EXTREME	Fire is being carried in shrub layer or tree crowns independent of surface fire. Flame lengths very high, rate of spread very high. Spotting ¼ mile or more creating significant threats to adjacent properties.