Understanding Dozers, Tractor Plows, and Airboats in Fire Program Analysis Initial Response Simulation Module IR_019_WP

Introduction

Fire Program Analysis (FPA) includes dozer, tractor plow, and airboat use for modeling fire event containment in the Initial Response Simulation (IRS) module.

Terms

Constant Fireline Production – Fire resource that produces chains of fireline at a constant rate from the time it arrives at the modeled fire event, until either the fire is contained or it reaches simulation limits.

Workshift Length – Time between when a fire resource's hourly availability begins until the resource must stop working, a consecutive 18-hours later. A fire resource can be available and construct fireline no longer than 18-hours.

Discussion

IRS characterizes dozers, tractor plows, and airboats by a constant fireline-production rate. These resources are not dependant on staffing to determine the fireline production rate. The IRS module assumes that once a dozer, tractor plow, or airboat begins producing fireline, it does not stop until the:

- Fire is contained, or
- Fire exceeds a simulation limit, or
- Resource reaches its workshift length

FPA bases fireline-production rates on the National Wildfire Coordinating Group (NWCG) Initial Attack Fireline Production Rates.

The dispatch logic uses producer types to determine the maximum number and type of fire resources needed for dispatch to a modeled fire event. Table 1 displays the producer type, description, and attributes associated with these fire resources.

Producer Type	Kind	Category	Description	Avg Speed (mph)	Dispatch Delay (min)	Response Delay (min)	Set-up Delay (min)	Workshift Length (hr)
DZR1	Equipment	Dozer	Type 1 Dozer	30	30	20	25	18
DZR2	Equipment	Dozer	Type 2 Dozer	30	30	20	25	18

Producer Type	Kind	Category	Description	Avg Speed (mph)	Dispatch Delay (min)	Response Delay (min)	Set-up Delay (min)	Workshift Length (hr)
DZR3	Equipment	Dozer	Type 3 Dozer	30	30	20	25	18
TP12	Equipment	Tractor Plow	Type 1 and 2 Tractor Plow	30	30	20	25	18
TP34	Equipment	Tractor Plow	Type 3 and 4 Tractor Plow	30	30	20	25	18
TP56	Equipment	Tractor Plow	Type 5 and 6 Tractor Plow	30	30	20	25	18
FBDZ	Equipment	Airboat	Airboat	30	30	5	5	18

Table 1: Producer Types and Attributes

Dozer fireline-production rates vary by producer type, fire behavior surface fuel model, specific condition, and slope class.

Tractor plow fireline-production rates vary by tractor plow producer type, fire behavior surface fuel model, and specific condition. IRS assumes tractor plows have no fireline production on slopes greater than 55%, and that a front or rear-mounted plow moves downhill.

Airboat fireline-production rates are equal to the production rates of a type 2 dozer on a 0% slope.

As part of the preparedness option, FPU planners specify the period that fire resources are available during the preparedness staffing season. Resource availability defines the period that a fire resource is available for fireline production in the model. The FPU planner defines the daily duty hours when each resource is available. Any resource needed to respond to a modeled fire event occurring outside of duty hours incurs a FPU planner-defined callback delay in addition to all mobilization delays. See Understanding Delays in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_009_WP for information about callback delays, and Understanding Preproduction Delays in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_005_WP for further information about mobilization delays.

See Also

- Understanding Delays in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_009_WP
- **(PENDING)** Understanding Airtanker Use in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_015_WP
- Understanding Preproduction Delays in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_005_WP
- **(PENDING)** Understanding Engine Use in Fire Program Analysis (FPA) Initial Response Simulation (IRS) Module IR_018_WP