

Wildfire 2011, Buxton, September 2011

# Costs of Wildfire

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# *social* / **Costs of Wildfire**

- Why worry about costs of wildfire?
- A template for costing
- Example: the Swinley Forest Fire
- Conclusions and implications for policy



# Social costs of wildfire

- Tie-up large amounts of resources
- External impact on transport, water resources, air quality
- Encourage management of land/fuel load
- Support less costly approaches to fire fighting and provide a financial case for training and specialised equipment



# Costs of Wildfire

## *some principles from economics*

- Concern with “social costs” – regardless of who bears the costs or whether they appear in a set of accounts
- Underlying principles of “social cost benefit analysis”
- (Speaking technically, we are concerned with “willingness to pay” or “marginal social opportunity cost”)

# Who does bear the costs of wildfire?

## *Swinley in practice*

- $\frac{1}{2}$  recovered from Central Government
- $\frac{1}{8}$  borne by local emergency services
- $\frac{1}{4}$  by road users (cars, buses, LGV's and HGV's)
- $\frac{1}{7}$  by land-owners

# Hard to establish costs of wildfire

- Fire service resource costing “varies”
  - £200 to £1,000 per hour
- Some direct costs omitted
- No evidence on ecosystem costs, clean air, damage to water supplies

*But:*

- Costing vehicle delays is a well established procedure

# Costs of Wildfire – a template

- *Direct costs*
  - Firefighting
  - Emergency Services
  - Landowners
- *Indirect costs*
  - Transport
  - Homes and businesses
- *Ecosystem damage*
  - Habitat and species
  - Water supply
  - Carbon loss/gain
- *Total social cost of fire*



# Example: Swinley Forest Fire



# Costs of Wildfire – Swinley/Crowthorne

## *Direct costs*

- firefighting
- emergency services
- landowners

**£500,000**

**£78,444**

**£140,000**

- all FRS involved
- police, ambulance
- Crown Estates & Forestry Commission

## *Indirect costs*

- transport delays
- homes & businesses

**£229,292**

- cars, LGV's, HGV's, PSV's

## *Ecosystem services*

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- not costed to avoid double counting

## *Total social cost*

**£947, 737**

# Costing Road Delays – Swinley

## *Assumptions*

- A3095 Foresters Way closed for a week, traffic diverts to A322
- 25,133 vehicles per day diverted
- Extra distance – 2 miles;
- Extra time – 5 minutes
- Average speed on diversion route 40 km/hr



# Costing Road Delays – Swinley Fire

## *Delay costs – (2010 prices)*

	car	bus	LGV	HGV	Total
Flow (AADT)	21,847	94	2,393	615	25,133
Occupants (Persons)	1.58	13.2	1.25	1	
Value of time (£/hr)	£12.87	£88.12	£14.31	£12.53	
Operating cost (p/km)	5.54p	37.49p	9.15p	21.64p	
Delay cost (£'s week)	£191,303	£5,596	£24,902	£7,491	<b>£229,292</b> <b>(£32,756 a day)</b>

Road flows from <http://www.dft.gov.uk/matrix/results.aspx>

Costs from Department for Transport, Transport Analysis Guidance, Values of Time and Operating Costs, TAG Unit 3.5.6, April 2011. Values converted from 2002 benchmark using GDP deflator.

# **Social costs of Wildfire –** *conclusions and implications*

- Firefighting and road disruption the big cost items
- Optimal to focus on strong initial attack to avoid road disruption?
- Risk assessment to avoid other indirect costs
- Try to reduce suppression costs
- *Shouldn't we have some evacuation plans for housing close to rural areas which anticipate road closure?*

# Thankyou



Torridon Fire, 2011 © Steve Carter