

Wildfire Cause Standard Summary

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Purpose: This paper provides a summary of the Fire Cause Task Group process for developing the Wildfire Cause Data Standard.

Background: The National Wildfire Coordinating Group (NWCG) Data Management Committee (DMC) and Communication, Education and Prevention Committee (CEPC) created a joint task group in October 2018 to develop a data standard for Wildfire Cause. This effort was driven by a joint National Association of State Foresters (NASF) and four federal agency project to develop a single final fire reporting capability called Interagency Fire Occurrence Reporting Modules (InFORM).

Karen Short with the Rocky Mountain Research Station compiles an annual Fire Occurrence Database (FOD) and identified significant difficulty mapping fire causes from the five federal and fifty plus state data sets. *A review of historical data indicates the categories in use are not mutually exclusive and therefore, the same cause can be reported multiple ways resulting in poor data quality for statistical reporting and analysis, including development of education and prevention programs.* Approximately 20% of the fires in the FOD between 1992-2017 were categorized as Misc/Other. In the 3,828 WFMI records analyzed by the task team, that number rose to nearly 30%. Education and prevention programs need better data to target specific audiences and causes to reduce the number of human caused wildfires. Implementation of the Wildfire Cause Data Standard will provide a critical tool to improve cause information and facilitate easier access through national level capabilities like the Interagency Wildland Fire Data Cache.

Working agreements and considerations: The task group identified key assumptions and agreements to guide the work in a way that minimized undesired impacts while moving toward a data schema that provided the best data possible going forward.

Agreements:

1. Historical data must be able to map to the new data schema with a high degree of confidence
2. Given the first bullet is addressed, consider adding, dropping or modifying the existing cause codes
3. The fire cause category labels need to be clear and as mutually exclusive as possible

Process: The task group was composed of education, mitigation and prevention specialist, wildland fire investigators, fire reporting SMEs, fire planners, research and data management specialists. The group referenced NFPA Standard 921 Guide for Fire and Explosion Investigation and NWCG PMS 412 Guide to Wildland Fire Origin and Cause Determination. We also assessed 3,828 historical records with user comments from WFMI Fire Reporting (BLM, BIA, NPS, BOR) and the FOD with over one million records against the proposed standard to ensure the schema better represented what users were trying to communicate about the fire cause.

The group met for two hours a week between October 2018 and May 2019 with one three day face to face meeting to produce the first draft of the standard. One of the biggest hurdles was figuring out how to post this multi-dimensional standard in a way that stakeholders could navigate and that produced meaningful information for the task group to review – this took some time and we owe Nancie Turner, NWCG Webmaster, a big thank you! This draft was posted for comment for 60 days and we received 960 comments from 89 individuals and NWCG committees. After fire season wrapped up, the task group addressed these comments and modified the standard, again meeting most weeks between November 2019 and January 2020. Because some of the changes based on feedback were significantly different than the initial draft, it was posted for comment a second time. In the second review, we receive 779 comments from 66

individuals, of which, 587 or 77% indicated agreement with the proposed standard. The task group addressed the remaining 192 comments and made some minor changes.

In addition, throughout both review processes, the task group tracked feedback that indicated a need for better definitions or descriptions and business rules to apply to implementation. These eighty “action items” will be used by the CEPC to update the NWCG Glossary, PMS 412, and applicable courses, like FI-210. The InFORM team will include the definitions, descriptions and business rules in their reporting guidance.

Proposed Standard: The proposed standard is more complex than the existing NASF General Causes and it also varies from individual federal agency’s cause lists – which were all a little different. However, the task group is confident that the complete standard will provide the best data possible with the least redundancy. The most impactful addition is an Age Category which can be applied to all cause categories which makes analysis for prevention and education programs much more complete and reliable. At a minimum, a few adjustments and additions at the general cause level will improve data collection. The table below maps the NASF general causes to the equivalent tier of the new schema – differences are noted in blue. Federal agency’s mapping was completed but not included here for brevity’s sake.

Existing NASF Cause Code General Cause	Proposed Fire Cause Standard General Cause
1-Lightning	Natural
2-Equipment Use	Equipment and vehicle use
3-Smoking	Smoking
4-Campfire	Recreation and ceremony
5-Debris Burning	Debris and open burning
6-Railroad	Railroad operations and maintenance
7-Arson	Arson
8-Children	Misuse of fire by a minor
9-Miscellaneous	Other causes
10-Fireworks	Fireworks
11- Power line	Power generation/transmission/distribution
12-Structure	Structure-(under Other)
	Firearms and explosive use
	Undetermined (Human or Natural)

The complete standard goes beyond this high level table to include:

- **Age Category:** discriminates between children (0-12), adolescents (13-17), and adults (18+)
- **Prohibited:** allows identification of an activity which was unlawful or otherwise prohibited (burn ban, unpermitted, etc.) *by local authorities*. It is important to note that this is determined by locality, not by a national standard or definition. By definition, all Arson fires are prohibited.
- **Specific Cause:** more detailed information associated with a General Cause category
 - Examples: burn barrel, explosive targets, passenger vehicle/RV
- **Specific Cause Detail:** more specific information about the cause or factors contributing to the ignition
 - Examples: hot slag, rock/hard surface strike
- **Activity/Group Category:** further refines information for prevention programs for targeted messaging
 - Examples: Private/Residential; Farming/Ranching; Logging

Based on our mapping of the WFMI records, implementation of this standard reduces Misc/other to less than 10%. In addition, the use of Age Category and Prohibited Flag allows us to see trends that are otherwise lost. For example, while Fireworks was the cause for less than 1% of the records, 43% of the records were associated with prohibited activities and 13% identified minors. Under the previous schema, a user had to pick one of these categories – children, incendiary (arson), or fireworks – and the relationship between them is lost. With clear, mutually exclusive categories that include attributes that cross all causes (Age, Prohibited, Activity/Group), education and prevention programs will have access to reliable, intelligent information, based on fire investigation, to focus limited program resources and maximize impacts.

It is worth noting that the standard requires Cause Classification and General Cause as a minimum. As agencies are able to update their systems and implement the standard, new requirements include Specific Cause, Age Category, and the Prohibited flag. Specific Cause Detail and Activity/Group remain optional. In addition, we recognize not all information will be known for all wildfires, instead, this standard provides a consistent way of reporting *known* information or indicating “unknown with required remarks” within every category in the standard. We expect applications will implement the standard in a way that eases data entry requirements, for example, Cause Classification could be derived from a General Cause.

Transition: The task group is recommending a ten year transition to the full standard as it has potential impacts across the wildland fire community. The NWCG PMS 412 will have to be reviewed and updated to incorporate the standard. Wildland fire IT investments may also be impacted by the new standard – InFORM plans to implement the full standard with the release of IRWIN 7.0 planned for April 2021.

At a minimum, the task group recommends, agencies not using InFORM add Firearms Use and Explosives and Age Category as soon as possible.

For further information, please contact:

Roshelle Pederson, Co-Chair DMC: kimber_pederson@ios.doi.gov

Terri Jenkins, Previous Chair CEPC: terri_jenkins@fws.gov

Tina Boehle, Chair CEPC: tina_boehle@nps.gov

This was a significant undertaking and the members of the task group worked on this for nearly two years. Terri and Roshelle have deep appreciation for the commitment and enthusiasm of the task group members and their coordination with their agencies and peers.

Task group members

Name	Committee / Experience	Agency	E-mail Address
Andy Kirsch	FRSC	NPS	Andy_Kirsch@nps.gov
BJ Glesener	FRSC and Fire Investigation	Minnesota DNR/NASF	Bill.glesener@state.mn.us
Deb Fleming	CEPC Branch Coordinator	NWCG	dlfleming@blm.gov
Dianna Sampson	FRSC	BLM	dsampson@blm.gov
Fred Turck	CEPC	VA DOF / NASF	Fred.turck@dof.virginia.gov
Gabriella Branson	DMC	AK DNR	Gabriella.branson@alaska.gov
Gary White	FISC*	NASF	Gary.white@glwa.us
Gwen Beavans	CEPC	USDA FS	gwen.beavans@usda.gov
Jeff Bonebrake	FISC	OR DF / NASF	Jeff.c.bonebrake@oregon.gov
Jeff Henricks	FISC	Canada	Jeff.henricks@gov.ab.ca
Jeff Moyer	FISC	BIA	Jeffrey.Moyer@bia.gov
John Bird	FISC	WV / NASF	John.w.bird@wv.gov

Jon Skinner	CEPC	BLM	jskinner@blm.gov
Josh Harvey	Fire Investigation	ID DNR / NASF	jharvey@idl.idaho.gov
Karen Curtiss	Education and Mitigation	USDA FS	Karen.curtiss@usda.gov
Karen Short	FRSC, Research	USDA FS	Karen.c.short@usda.gov
Kenny Jaramillo	CEPC	BIA	Kenneth.Jaramillo@bia.gov
Laura Barrett	FRSC, IFPC	USDA FS	Laura.barrett@usda.gov
Marley Marshall	DMC Branch Coordinator	NWCG	mmarshall@blm.gov
Paul Schlobohm	Branch Coordinator	NWCG	(retired)
Richard Woods	FISC	Other	wfireinv@bigpond.com
Roshelle Pederson	DMC	DOI/USDA FS	Kimber_pederson@ios.doi.gov
Steve Larrabee	FRSC	BIA	Steven.Larrabee@bia.gov
Terri Jenkins	CEPC	FWS	Terri_jenkins@fws.gov

* Fire Investigation Subcommittee under CEPC