Setting the Scene

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The Strategic Directions for Fire and Emergency Services in Australia and New Zealand 2017-2021 are endorsed by AFAC Council and the Australia-New Zealand Emergency Management Committee and offer a collective, shared vision for the future of the emergency management sector.
Predictive Services Group

We are the strategic advisory group to the AFAC Council on Predictive Services. We are nationally focused and advocate the future direction of Predictive Services through collaboration and coordination. Our initial focus will be on bushfire.

Vision: Taking the surprise out of bushfires for safer communities

 Strategic outcomes 2018–2021

Enhance capability and enable timely and informed decisions based on predictive services.

Provide confidence through scientifically rigorous, reliable and specific predictive services.

Develop predictive services through a well communicated, adaptive, innovative and collaborative approach.

Facilitate national interoperability and consistency in predictive services.

Strategic drivers and priority actions

1. Improving interoperability and sharing resources
   1. Agree minimum training and accreditation standards
   2. Establish operational protocols
   3. Establish resource sharing arrangements

2. Leading innovation in science and technology
   1. Identify/evaluate supporting systems & products
   2. Improve Seasonal Outlook process
   3. Develop R&D priorities
   4. Development of new/improved decision support tools
   5. Support research & implementation

3. Enhance predictive services capability in sector
   1. Develop systems, products/info for both tactical and strategic decision making
   2. Develop training for predictive services practitioners and end users
   3. Establish collaboration network for practitioners

4. Enhance community understanding of risk and mitigation strategies
   1. Develop stakeholder engagement plan
   2. Develop comms plan
   3. Strengthen collaboration with community stakeholders
   4. Identify key community needs

5. Develop national best practice principles and standards
   1. Standards for systems, processes and data
   2. Develop evaluation frameworks
   3. Develop a transition to operations process

6. Harnessing projects and funding at a national level
   1. Identify new strategic partners and funding sources.
   2. Develop investment strategy
   3. Support NFDRS
   4. Support BoM Hazard Services Forum
   5. Support Prescribed Burning Centre of Excellence
   6. Support BNHCRC
   7. Support Warnings Group

Version 2
October 2018
A Framework

Research Prototype (Fire behaviour index)
- Modular
- Continual Improvement

FDR categories
- Static website (daily max)
- Interactive website (hourly)
- Red Flag warnings
  - Wind change
  - E.Halves
- C.Halves

Fuel type
- Grassland
- Woodland
- Spinifex
- Buttonsgrass
- Forest
- Maritime
- Shrubbland
- Pine

Fire behaviour estimates
- Rate of spread
- Fireline intensity
- Flame height
- Spread probability

HOT definitions
- Fire behaviour and weather
- Prescribed burn implications
- Suppression and containment
- Consequences

1. Mostly self-extinguishing moderate fires
2. Typical prescribed burning conditions, fires generally easy to suppress
3. Most indifferent to weather, fires typically suppressed with drip torch or water
4. Initial attack success critical to prevent large fire development
5. Defensive suppression strategies
6. High levels of threat to life and property
7. High levels of threat to community property
8. High levels of threat to life and community

Fire behaviour models
- Grassland
- Woodland
- Spinifex
- Buttonbush
- Forest
- Maritime
- Shrubbland
- Pine

Operational calibration
- Revision
- Improvements
- Climatology

Operational decision making framework
- Regional ratings
- Total fire bans
- Agency preparedness
- Resourcing

Public facing framework
- Fire danger signs
- Community preparedness
- Warnings

Social research
- Awareness
- Understanding
- Design

System build
- Fuel state editor
- Fire danger calculations
- Fire danger viewer
- Seasonal outlook

Prototype performance
- Live trial observations
- Case studies
- Remote sensing
- Prescribed burns

Evaluation

Next Phase

Inputs
- Spatial data
- Fuel type
- Fuel state
- Weather

Computations
- Fire behaviour estimates
- FDR definitions
- Fuel type

Products
- Research Prototype (Fire behaviour index)
- Operational calibration
- Prototype performance

Next Phase
What’s missing here...

better sensing
better data
better information
better maths
better computing
better modelling
better simulation
better risk information
better impact information ...

better decisions
What’s ahead?

**PHASED APPROACH FOR THE PROGRAM DEVELOPMENT**

**PHASE 1** — Feasibility study.
- Developed the Research Prototype Fire Behaviour Index (FBI) based on calculations from operationally ready fire spread models. It meets the criteria of being national, modular and open to continuous improvement.
- A national social research project has identified that the current public facing system is too complex and needs optimising, retraining and simplification.
- PHASE 3 will see a new AFRDS, based on the Research Prototype Fire Behaviour Index.

**PHASE 2** — Change Management.
- The project will deliver a more accurate way of assessing the fire risk in the landscape, that is scientifically proven, and supports better decision making.

**PHASE 3** — Create prototype for other indices.
- The project will deliver a system that is accurate and provides clear messages on the forecast fire danger and what actions they should consider.

**PHASE 4** — Building the improved FBI into the system.
- The project will support preparedness decisions, planning, regulation of land management and other activities.

**BENEFITS OF AFRDS**

For the emergency service:
- The project will deliver a more accurate way of assessing the fire risk in the landscape, that is scientifically proven, and supports better decision making.

For the community:
- The project will deliver a system that is accurate and provides clear messages on the forecast fire danger and what actions they should consider.

For all others:
- To support preparedness decisions, planning, regulation of land management and other activities.

**Australian Fire Danger Rating System**

August 2019

Published Reports
AFDRS Research Prototype Report 2019
What’s ahead?

Changing Climate
What’s ahead?

**Air quality and pollution**

“As one of the most significant environmental hazards after climate change, air pollution contributes to the global burden of disease (GBD) ...”
What’s ahead?

Learning to deal with complexity
A Challenge

“We must move away from short-sighted, segmented planning and implementation to transdisciplinary, collaborative approaches...”