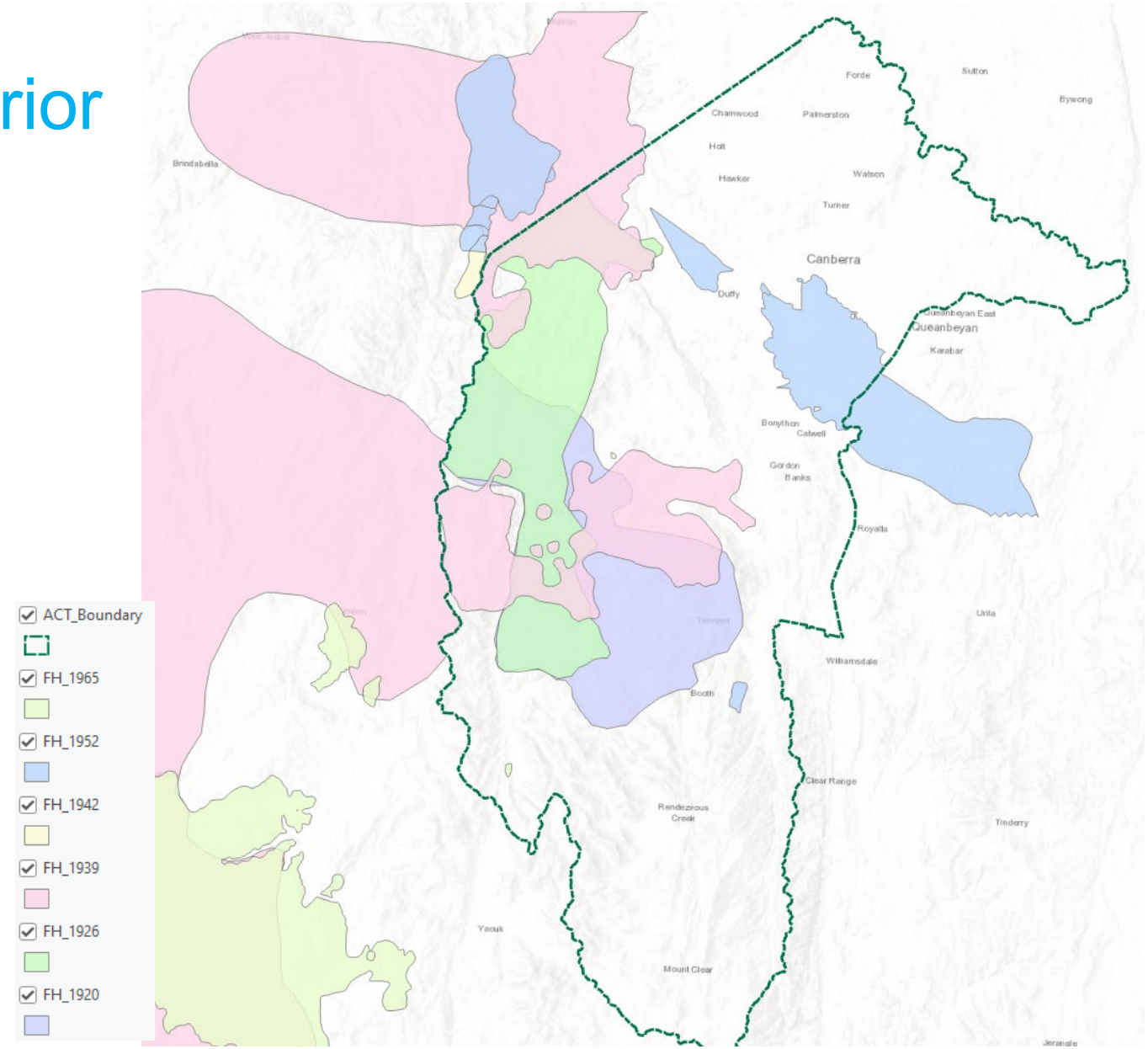
ACT Parks and Conservation Service
Fire Management Unit
Advisory Committee presentation

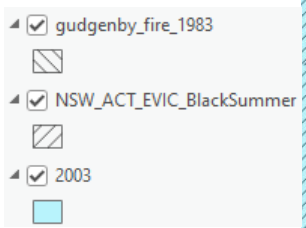
Fire in the landscape

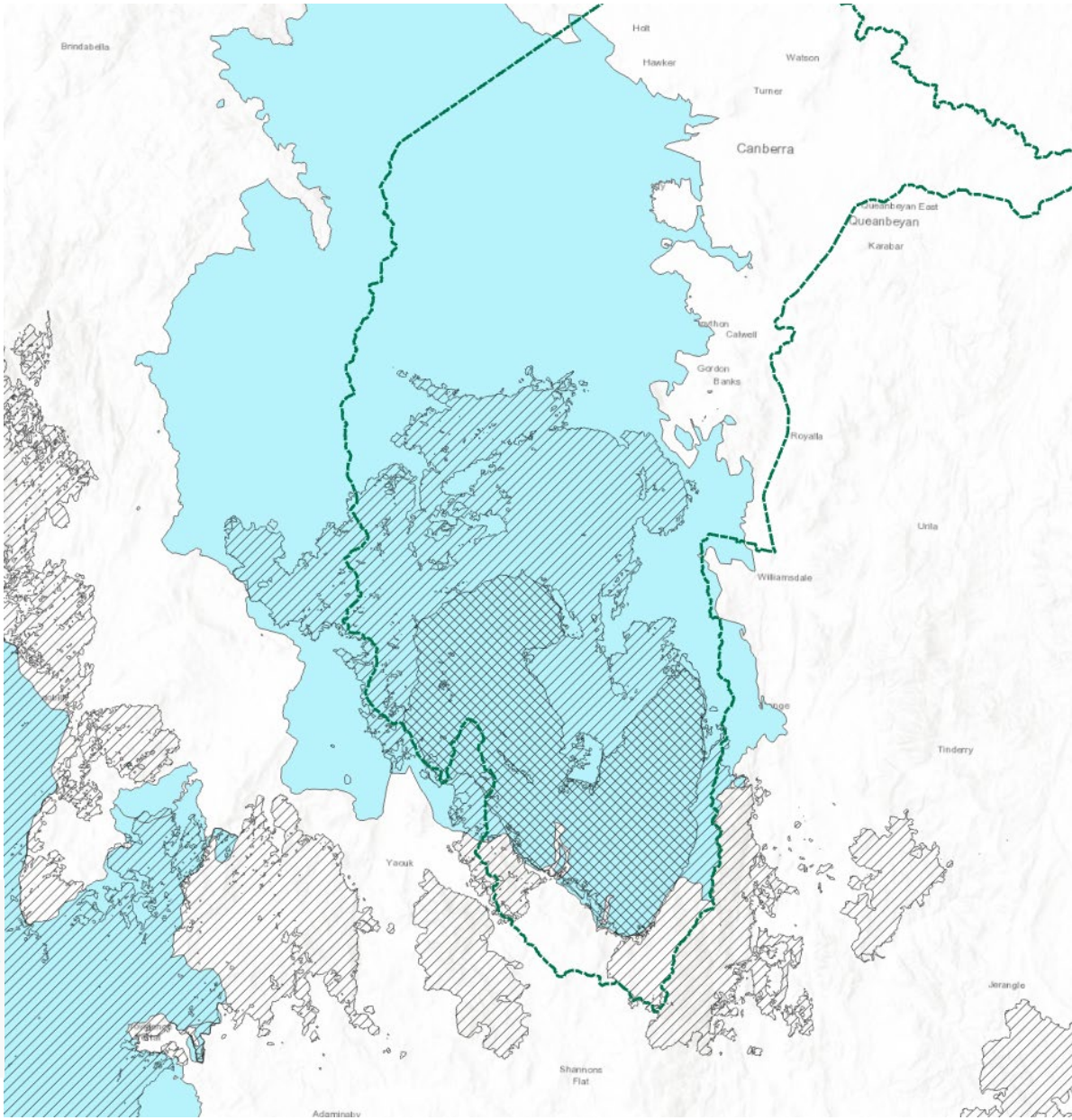
- Bushfire have been a fundamental part of the ACT landscape over time
- Last 100 years has seen many fires, grassland as well as forest, varying in size and intensity and impact on human assets as the population increases
- The ACT now has the shortest interfire major bushfire interval of all States – down from 70+ years to 18 years according to research (Canadell et al 2021)
- Fire behaviour has three drivers: Fuel – Weather – Topography. the management lever we can apply that will affect fire behaviour is fuel

Major fires prior to 1983



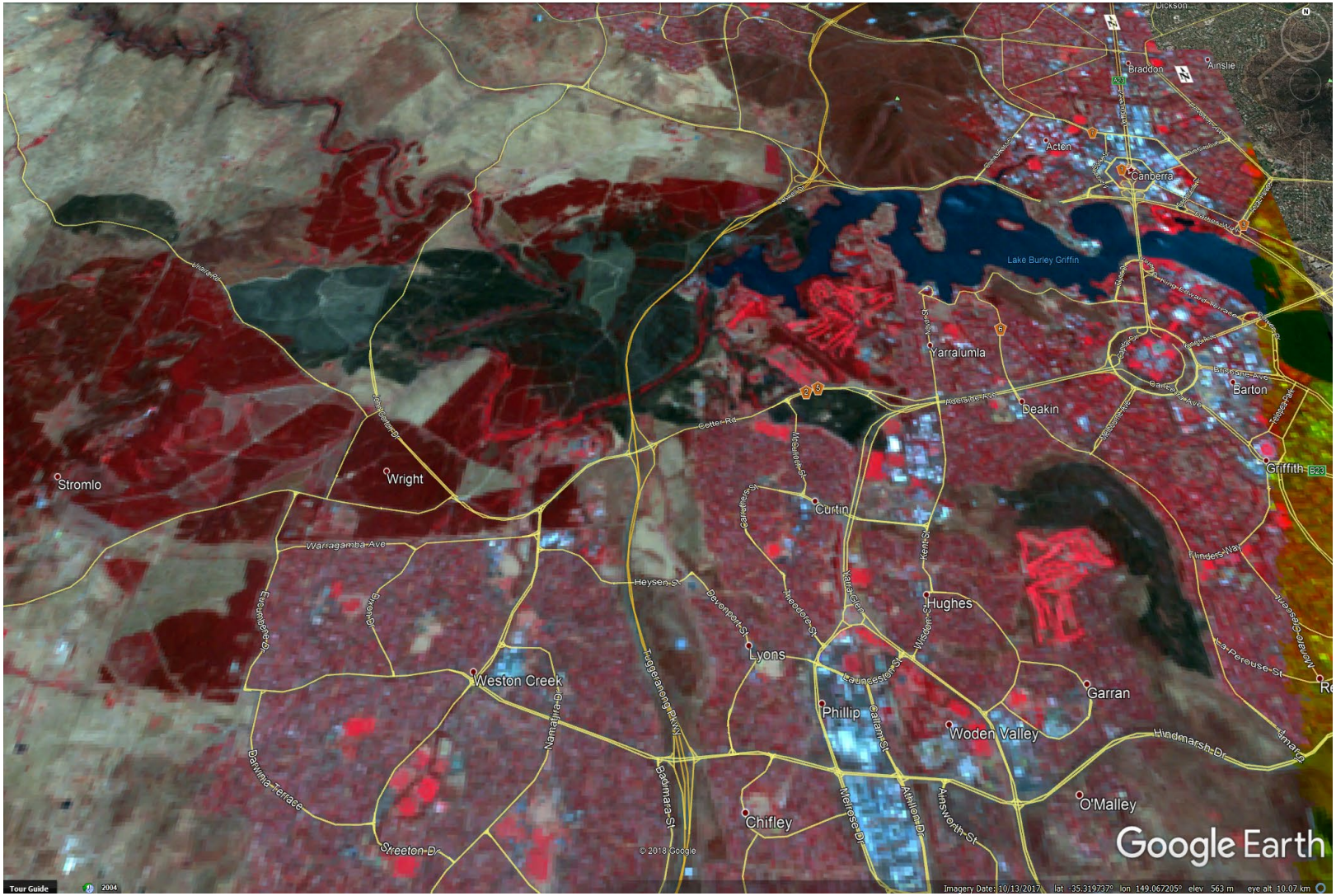
1983 - present





2001

2001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Braddon
Ainslie
Acton
Canberra
Lake Burley Griffin
Yarralumla
Deakin
Barton
Griffith
Stromlo
Wright
Curtin
Hughes
Lyons
Weston Creek
Phillip
Garran
Woden Valley
Chifley
O'Malley
Hindmarsh Dr
Warragamba Ave
Heysen St
Tuggeranong Pkwy
Badimara St
Sreeton Dr
Nenagh St
Flinders Way
La Perouse St
Google Earth
© 2018 Google
Tour Guide
2004
Imagery Date: 10/13/2017 lat -35.319737° lon 149.067205° elev 563 m eye alt 10.07 km

Fire in the landscape

- All jurisdictions use prescribed burning as a fuel management tool, to deliver ecological outcomes and to support cultural outcomes
- When designed and implemented well, avoids the detrimental impacts of too frequent intense fire on forest ecosystems
- Renewed focus on management practice since 2019-20 fire season with the emergence of alternative views on prescribed burning
- Most areas are unlikely to reach 40+ years of fuel age without bushfire impact under climate change scenarios
- The review of the SBMP and RFMP provide the opportunity to confirm ACT approach to fire management

Prescribed Burning

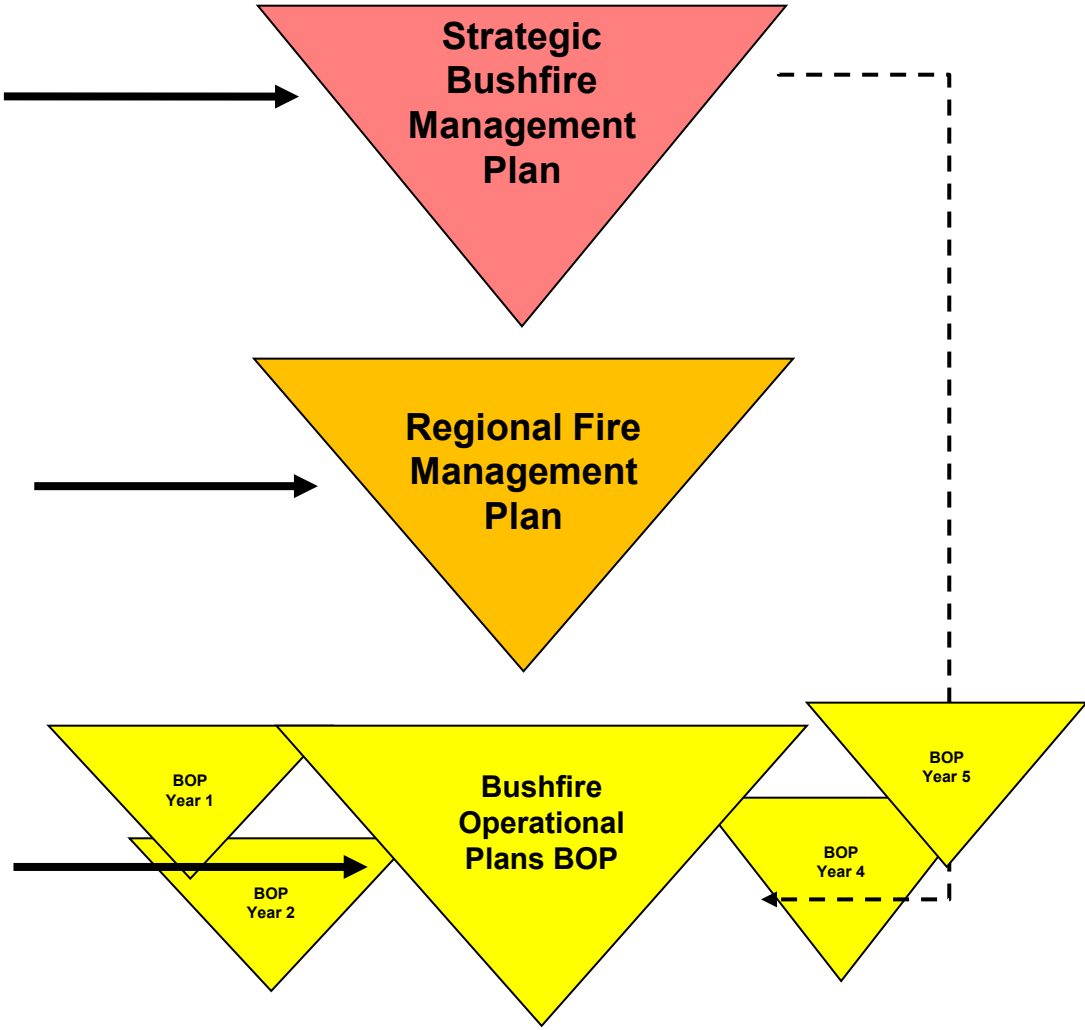
- PCS implement prescribed burning for a range of 3 broad objectives – fuel/hazard reduction, ecological and cultural burning, or a combination of the above
- To achieve the stated objectives - all PCS prescribed burns are subject to prescriptions
- We implement lighting patterns designed to reduce the fuel for the site –We employ “cool burns” . We retain around 30-50% of the area as unburnt (patchiness), creating havens and age diversity within the burn site
- We work to assist local Ngunnawal community and are partnering in achieving their objectives
- PCS subscribes to literature, research and practices adopted, supported and endorsed by AFAC, the Bushfire and Natural Hazards CRC and the National Centre for Prescribed Burning Excellence

ACT Bushfire Management Planning Framework

Strategic Bushfire Management Plan (SBMP)
- requirement of the *Emergencies Act 2004*.
- reviewed every 5 years
- Responsibility of Minister for Emergency Services

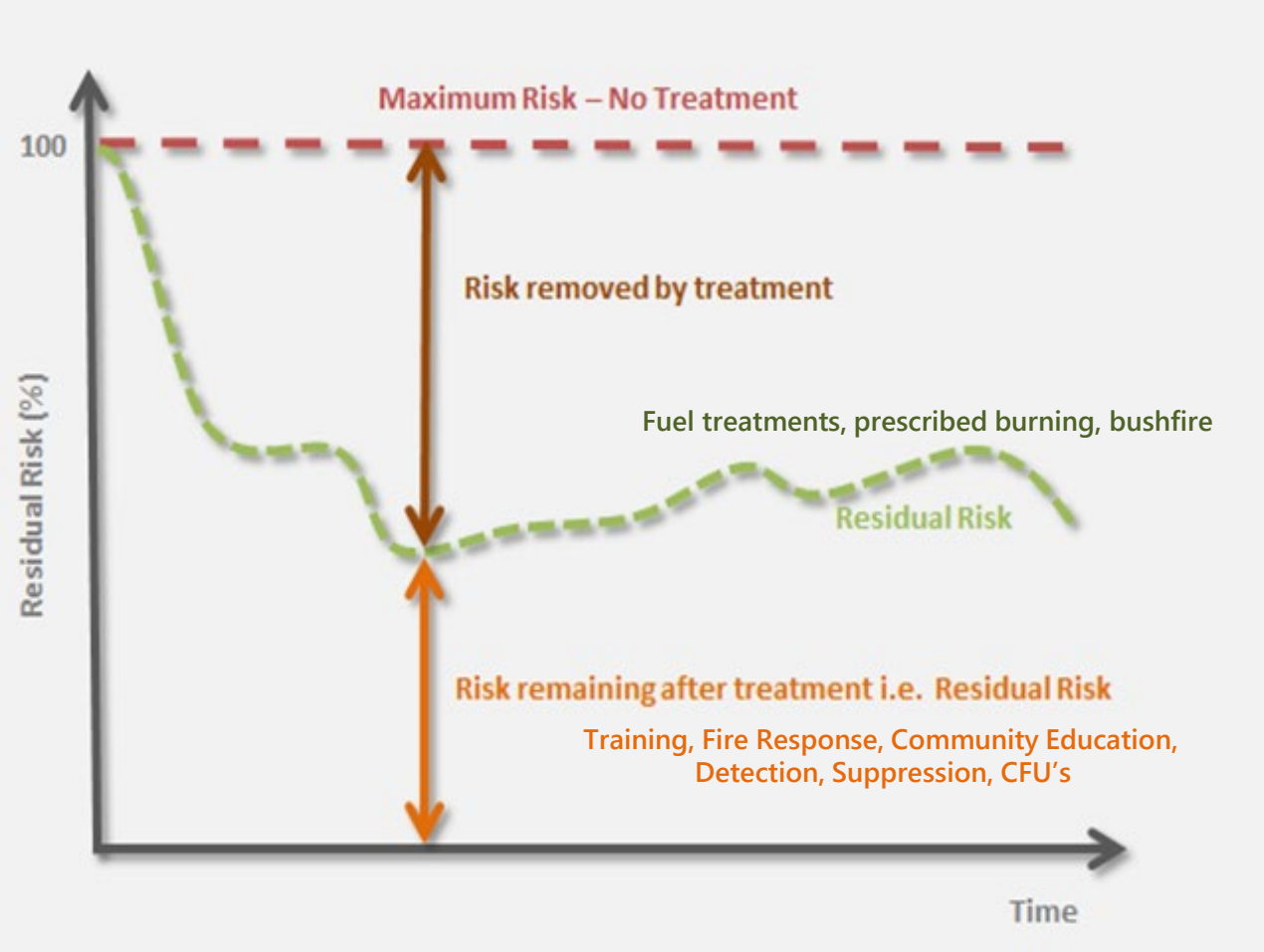
EPSDD Regional Fire Management Plan (RFMP)
- bridges the gap between broad planning and specific operations
- planning of prescribed burns
- 5 Year Plan with a 10 year outlook

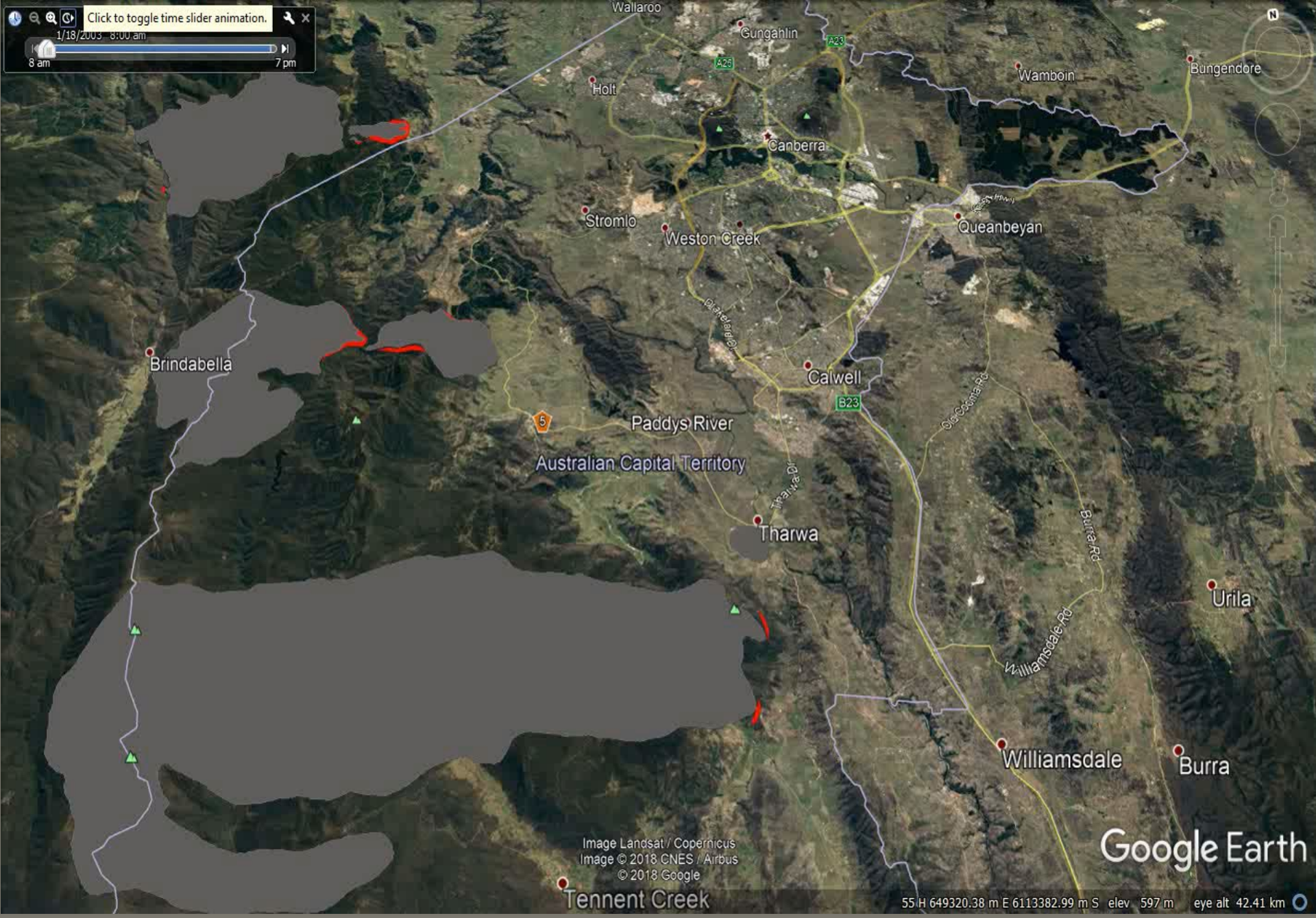
Bushfire Operational Plans (BOPs)
- operational annual plans - detail fire and fuel mitigation activities



Residual Risk

- Measures the effect fuel treatments such as planned burning
- Also incorporates stochastic fire events 2003, 2020
- Risk can be calculated for houses, water quality, ecological assets
- Assumptions:
  - APZs treated
  - Assumes grazing
  - Grass 2 tonne/ha
  - Fuel accumulation
  - No suppression

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8 am
7 pm
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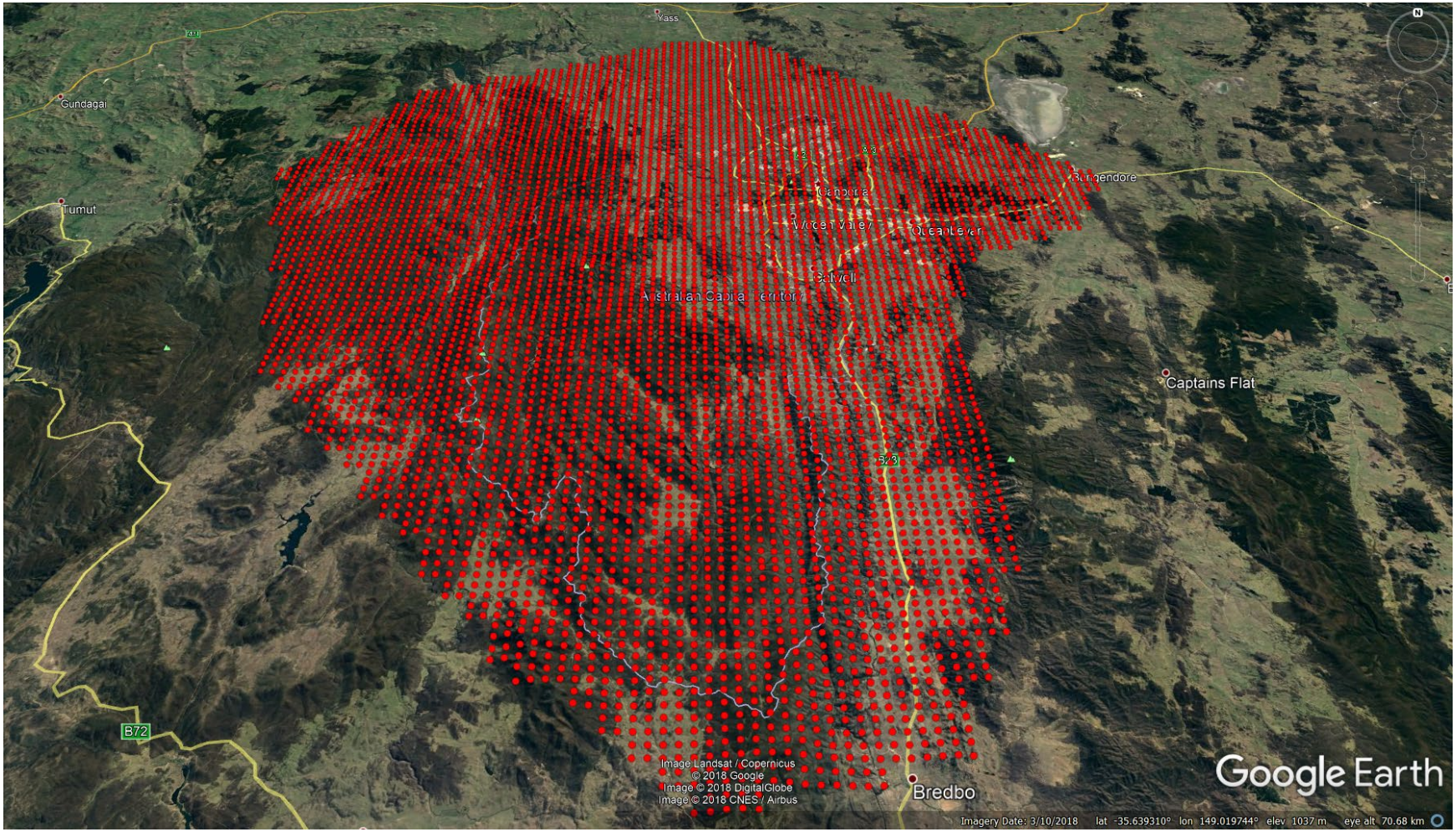
Gungahlin
A23
A25
Holt
Wamboin
Bungendore
Canberra
Stromlo
Weston Creek
Queanbeyan
Brindabella
Calwell
B23
Paddys River
Australian Capital Territory
Tharwa
Urila
Williamsdale
Burra
Tennent Creek
Image Landsat / Copernicus
Image © 2018 CNES / Airbus
© 2018 Google
Google Earth
55 H 649320.38 m E 6113382.99 m S elev 597 m eye alt 42.41 km

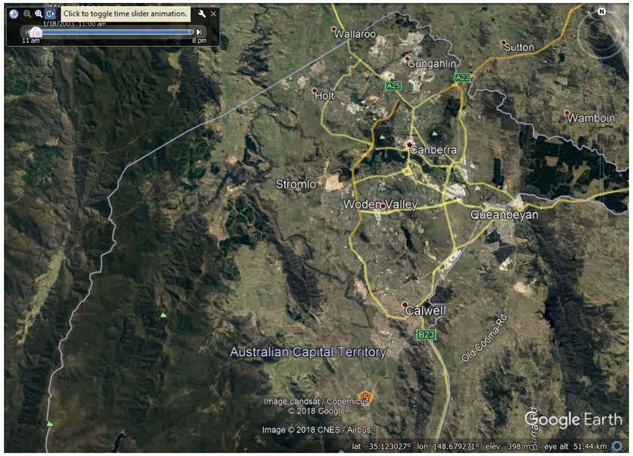
Canberra “fire catchment” and 1km ignition grid – 6599 points

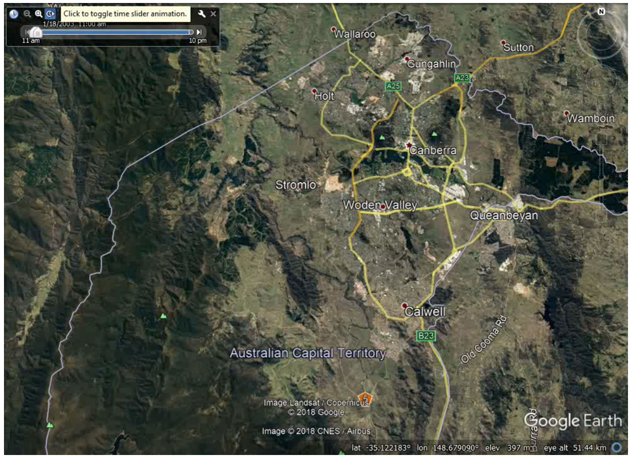


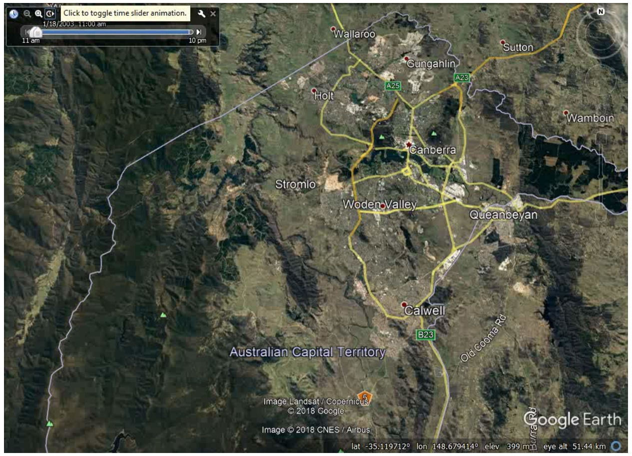
Individual Phoenix fire ignition runs - examples

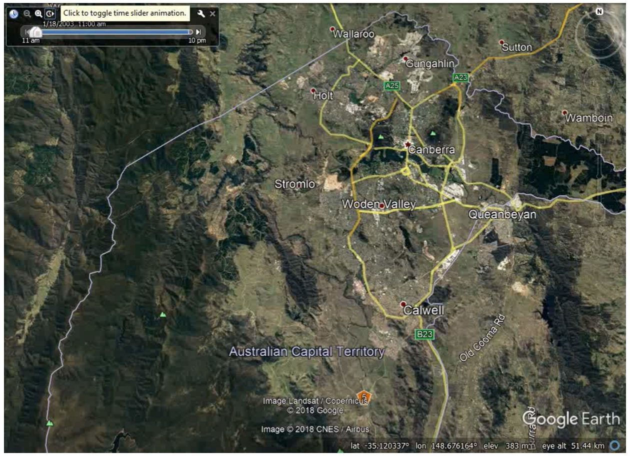
Each of the 6599 fires is run individually.

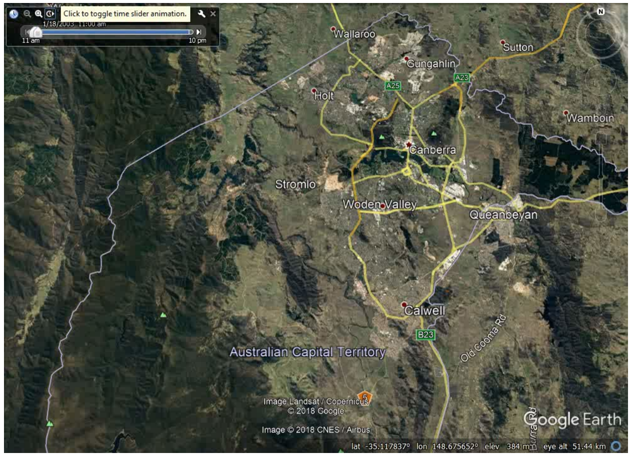
Metrics (fire size, house loss, area of plantation burnt, kms of powerline, biodiversity values etc) are calculated for each fire.

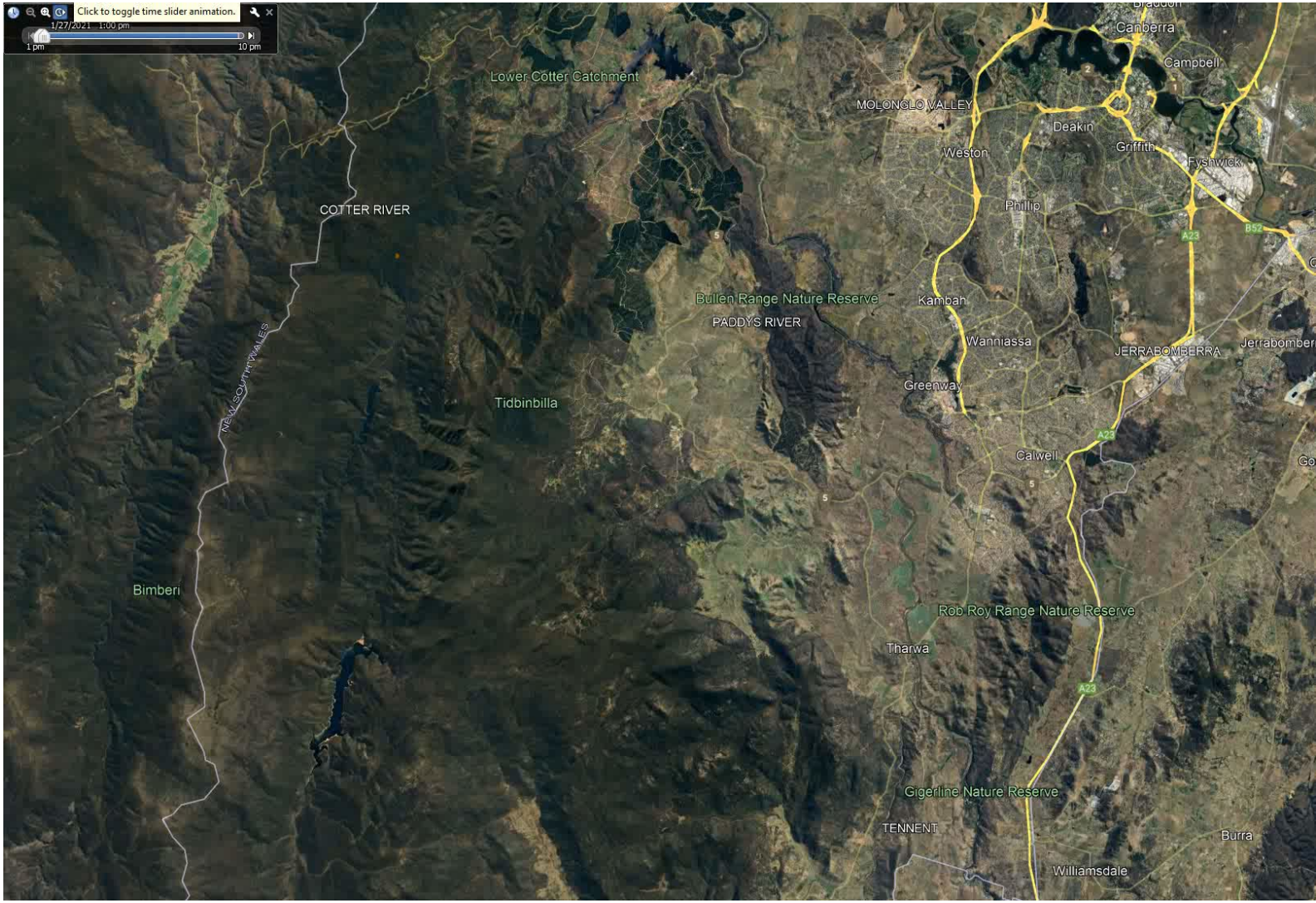








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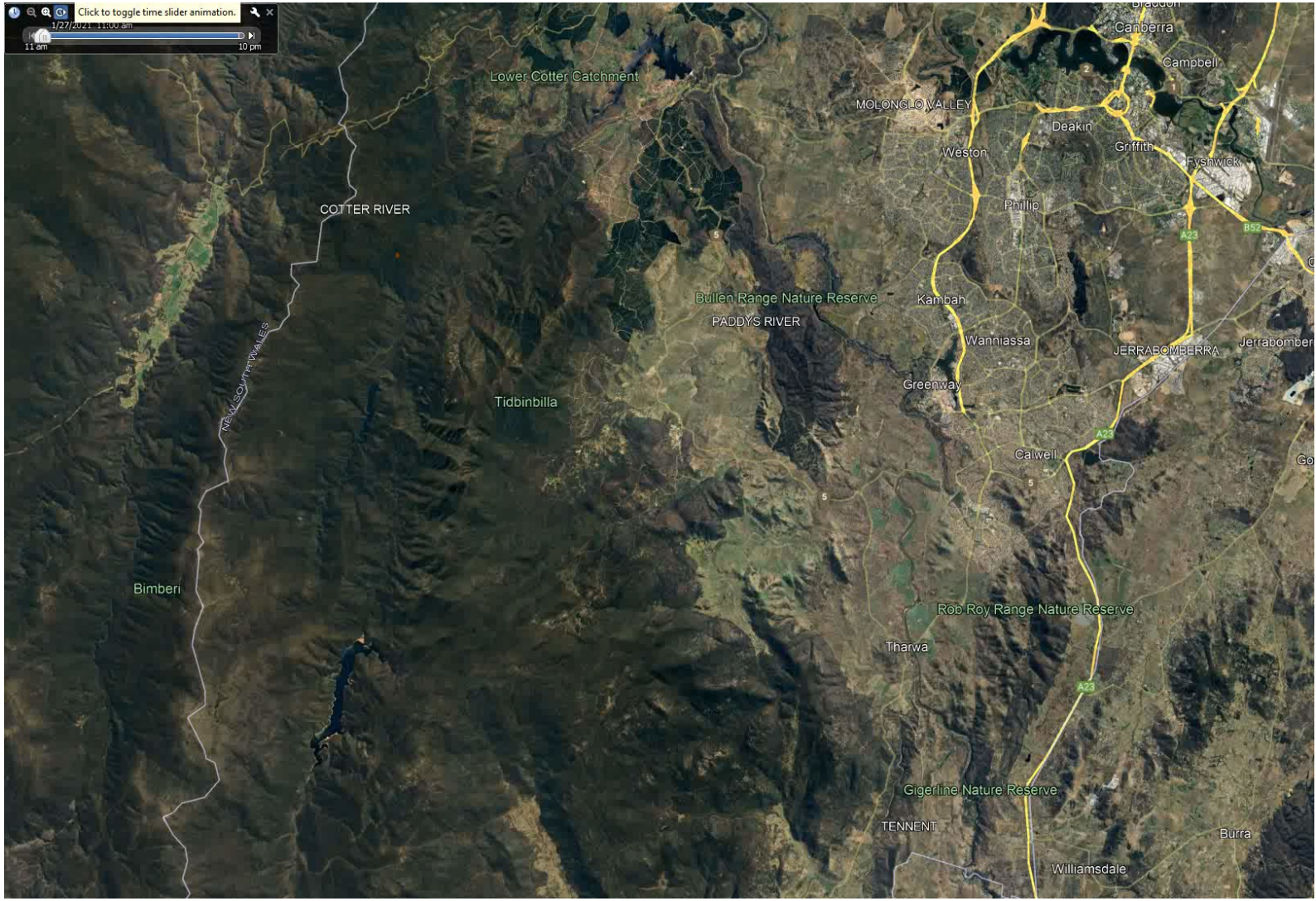
1 pm
10 pm
Lower Cotter Catchment
COTTER RIVER
NEW SOUTH WALES
Tidbinbilla
Bimberi
Bullen Range Nature Reserve
PADDYS RIVER
MOLONGLO VALLEY
Canberra
Campbell
Deakin
Weston
Griffith
Fyshwick
Phillip
Kambah
Wanniassa
JERRABOMBERRA
Greenway
Calwell
Rob Roy Range Nature Reserve
Tharwa
Gigerline Nature Reserve
TENNENT
Burra
Williamsdale
A23
B52

FFDI 30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COTTER RIVER
NEW SOUTH WALES
Tidbinbilla
Bimberi
Bullen Range Nature Reserve
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MOLONGLO VALLEY
Canberra
Campbell
Deakin
Weston
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Fyshwick
Phillip
Kambah
Wanniassa
Greenway
JERRABOMBERRA
Jerrabomberra
Calwell
Rob Roy Range Nature Reserve
Tharwa
Gigerline Nature Reserve
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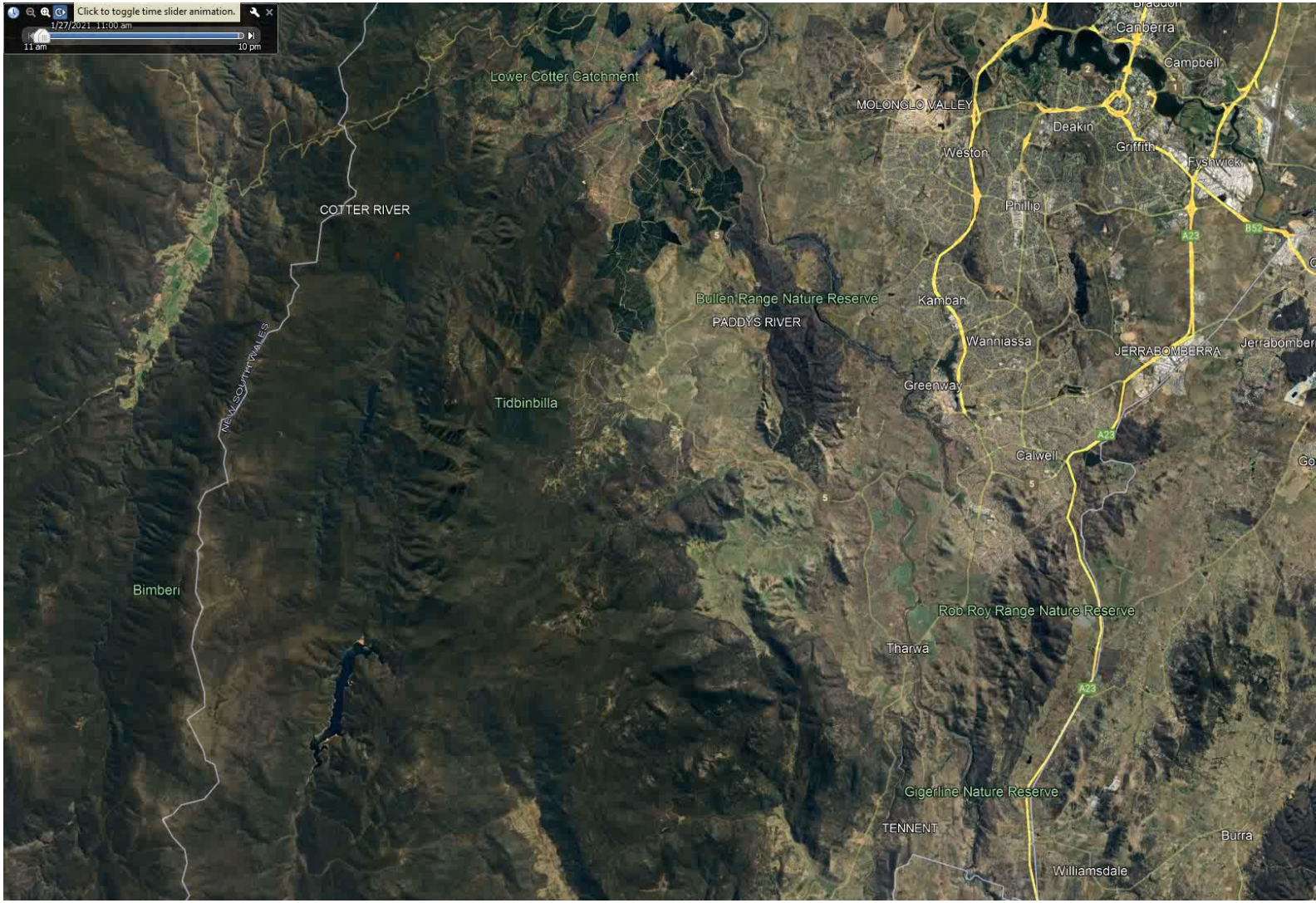
Burra
Williamsdale
A23
B52

FFDI 50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Bimberi
Bullen Range Nature Reserve
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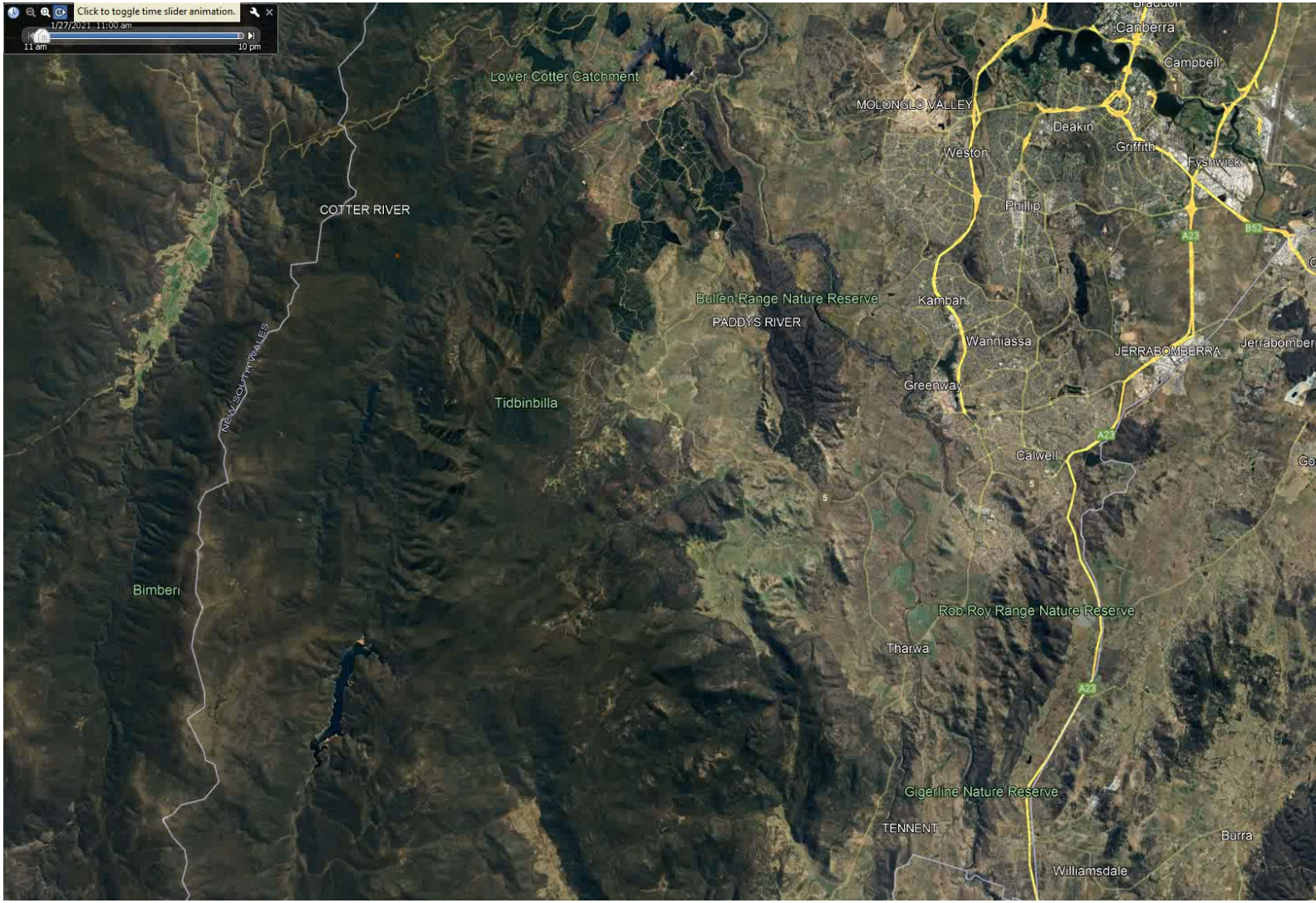
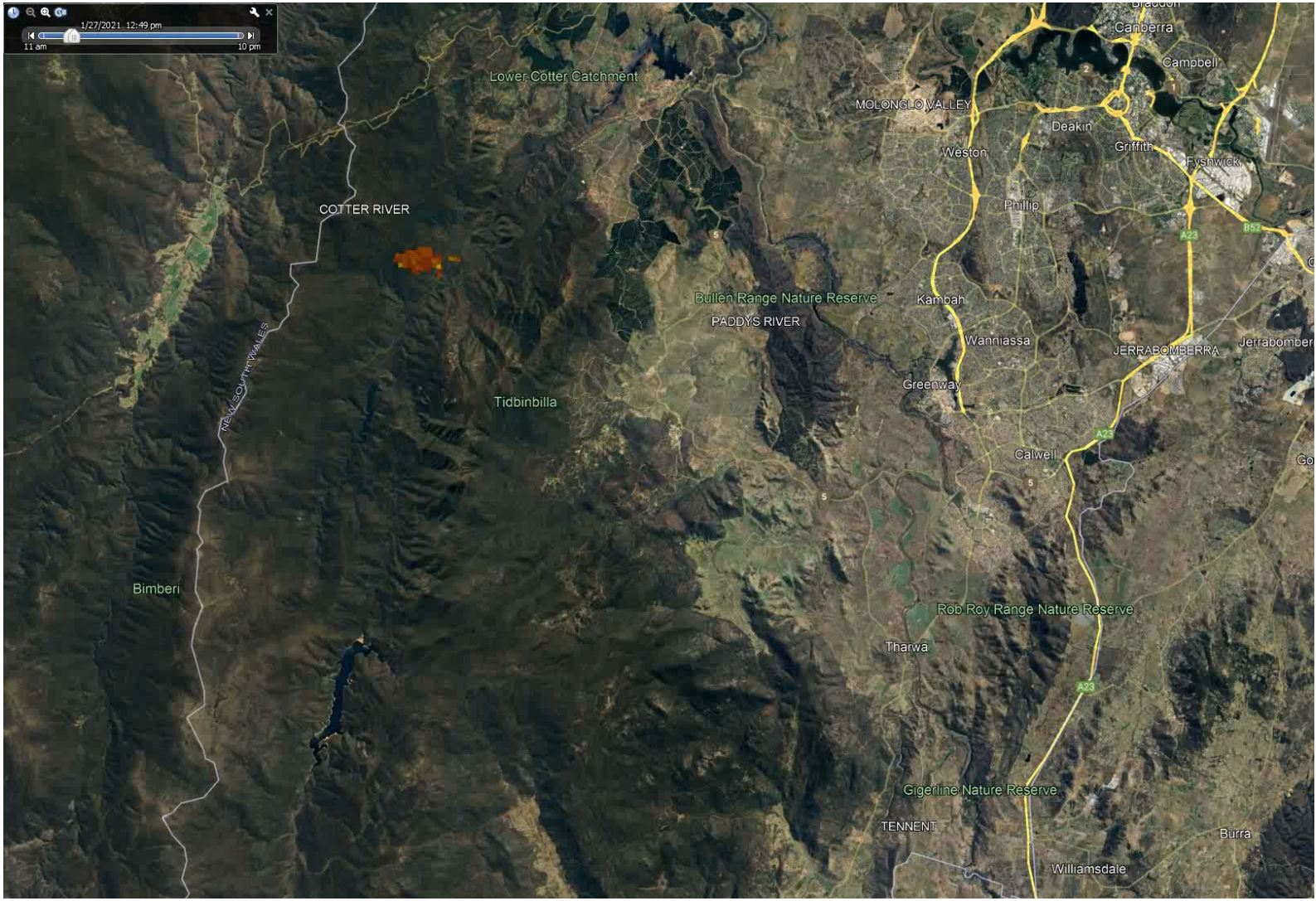
Canberra
Campbell
Deakin
Weston
Griffith
Fyshwick
Phillip
Kambah
Wanniassa
JERRABOMBERRA
Greenway
Calwell
Rob Roy Range Nature Reserve
Tharwa
Gigerline Nature Reserve
TENNENT
Burra
Williamsdale
A23
B52

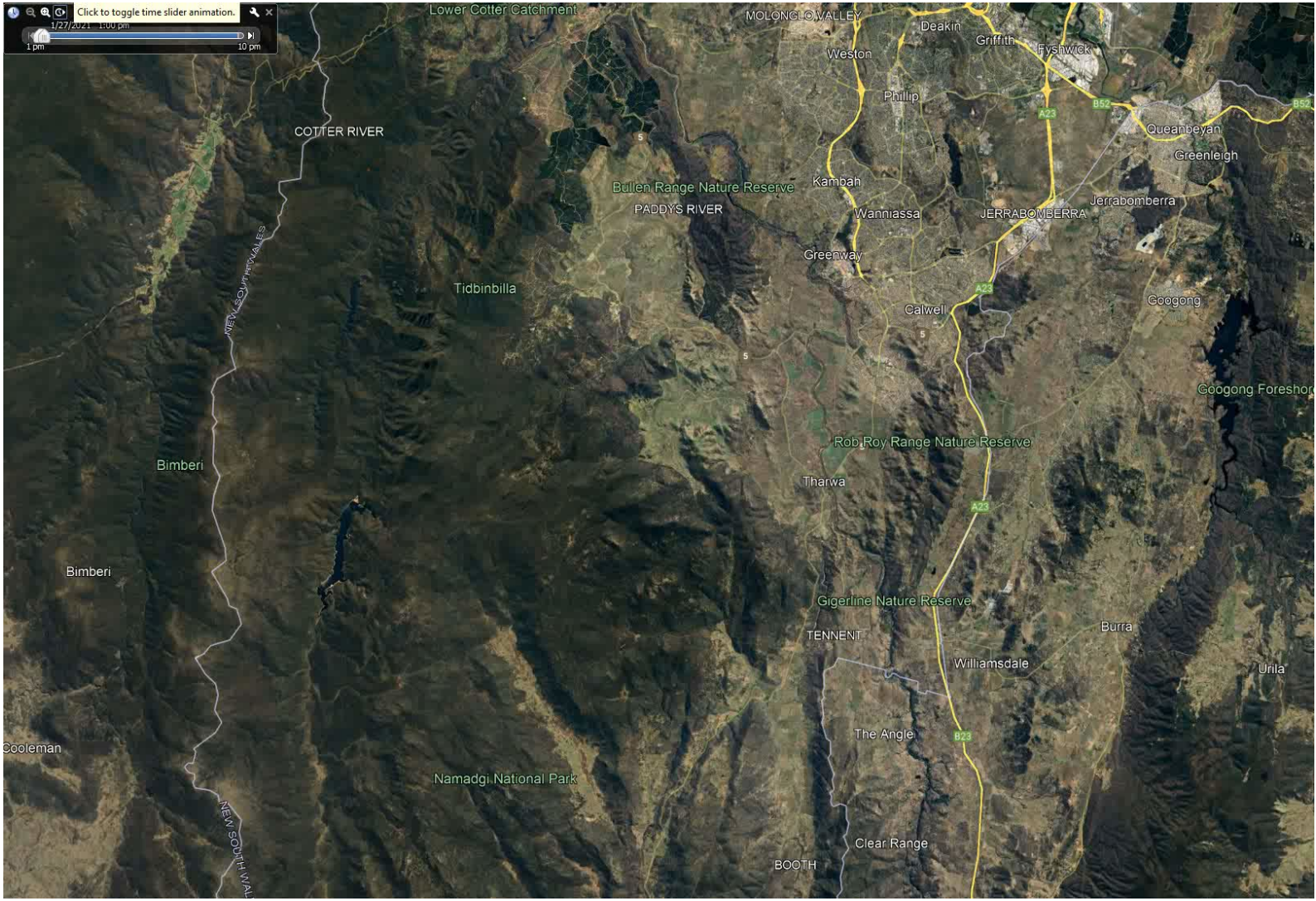
FFDI 75

FFDI 90
Used in calculations as a worst case





FFDI 90 altered wind direction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Lower Cotter Catchment
MOLONGLO VALLEY
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Griffith
Fyshwick
Weston
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PADDYS RIVER
Wanniassa
JERRABOMBERRA
Jerrabomberra
Greenway
Tidbinbilla
Calwell
Googong
Googong Foreshore
Rob Roy Range Nature Reserve
Bimberi
Tharwa
Bimberi
Gigerline Nature Reserve
TENNENT
Burra
Williamsdale
Urila
The Angle
B23
Cooleman
Namadgi National Park
Clear Range
BOOTH

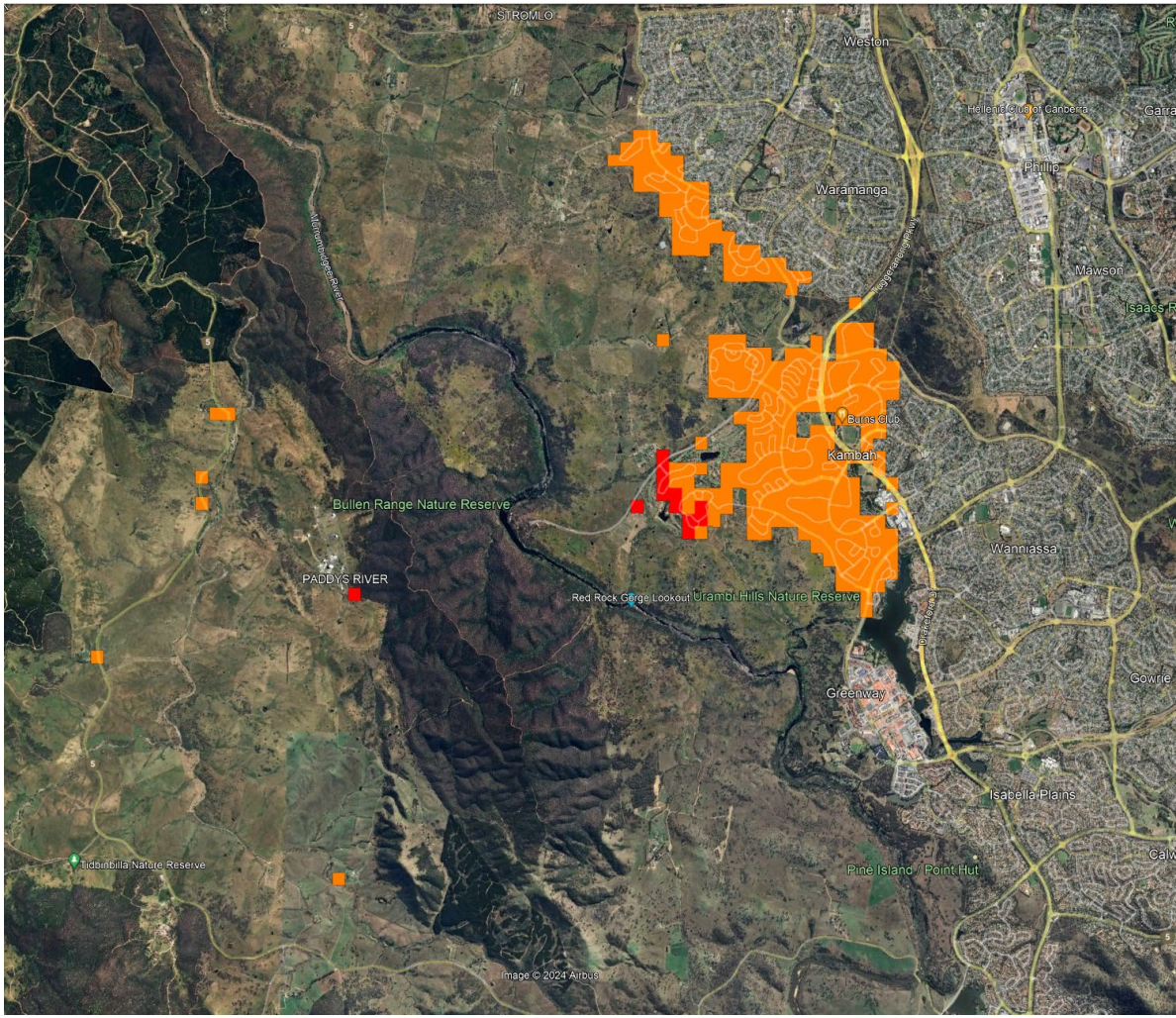
FFDI 100

Address Points

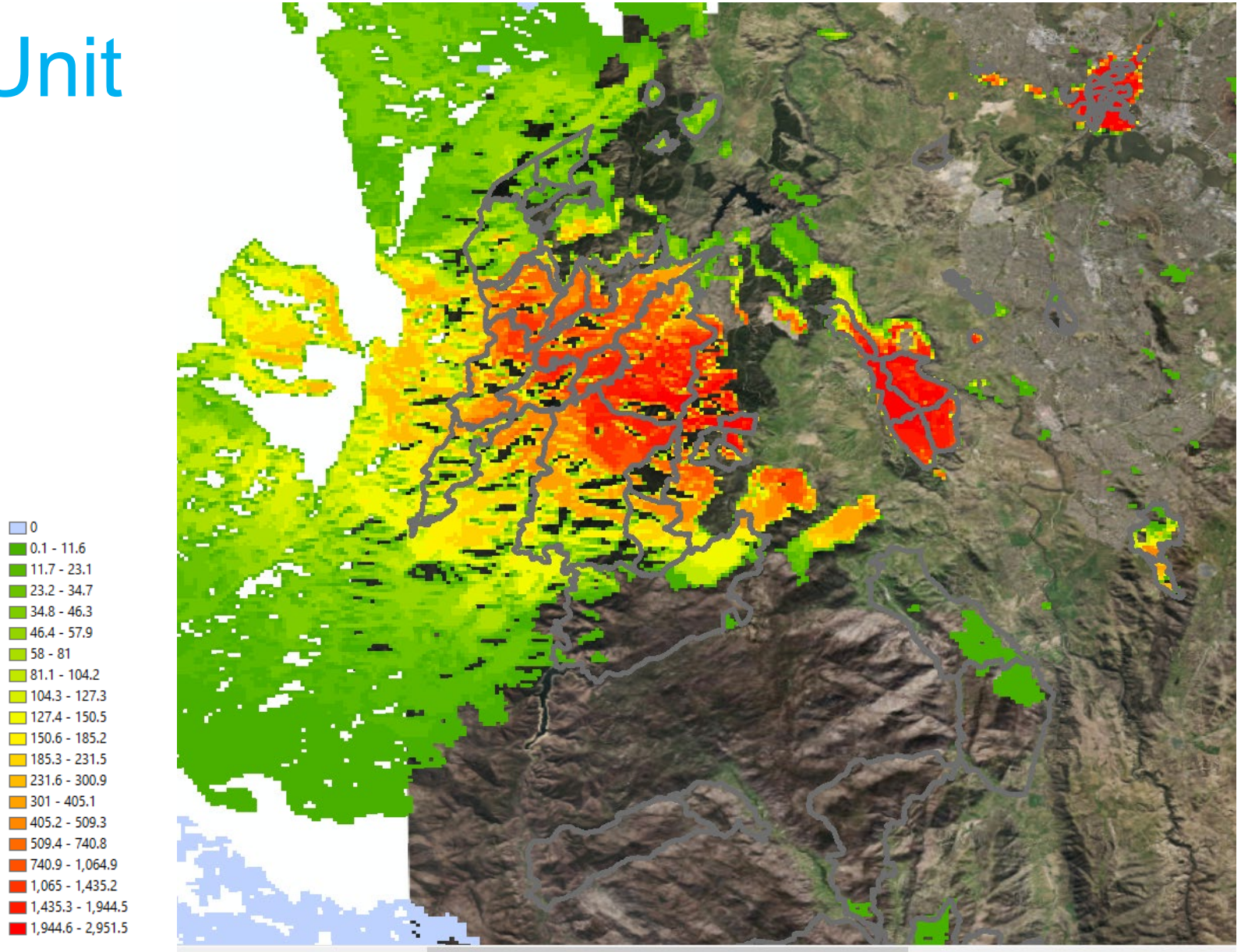
- ACT and NSW data
- Address generally located near house but not always
- Is a good surrogate for loss of house and human life
- Use latest house-loss algorithm

Address-point (House-Loss) impacts

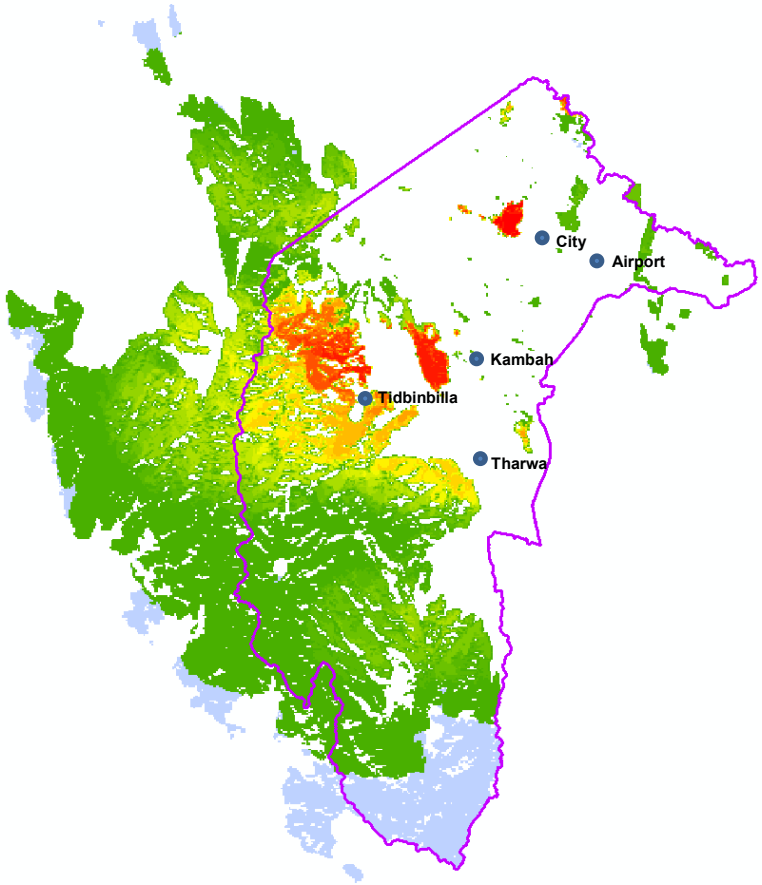
- Example of impact locations from FFDI 90 fire run

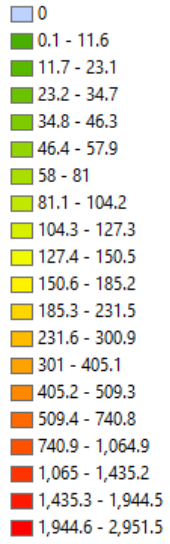


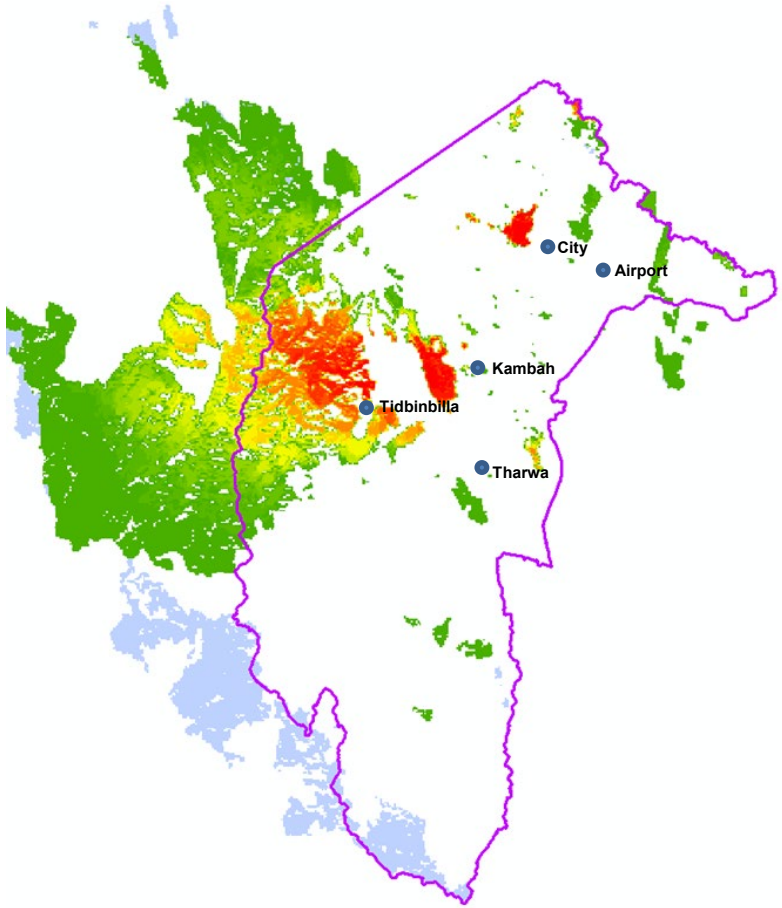
Burn Unit Score



Areas of highest ‘Residual Risk’ 2019 versus 2020 (ACT Address points)

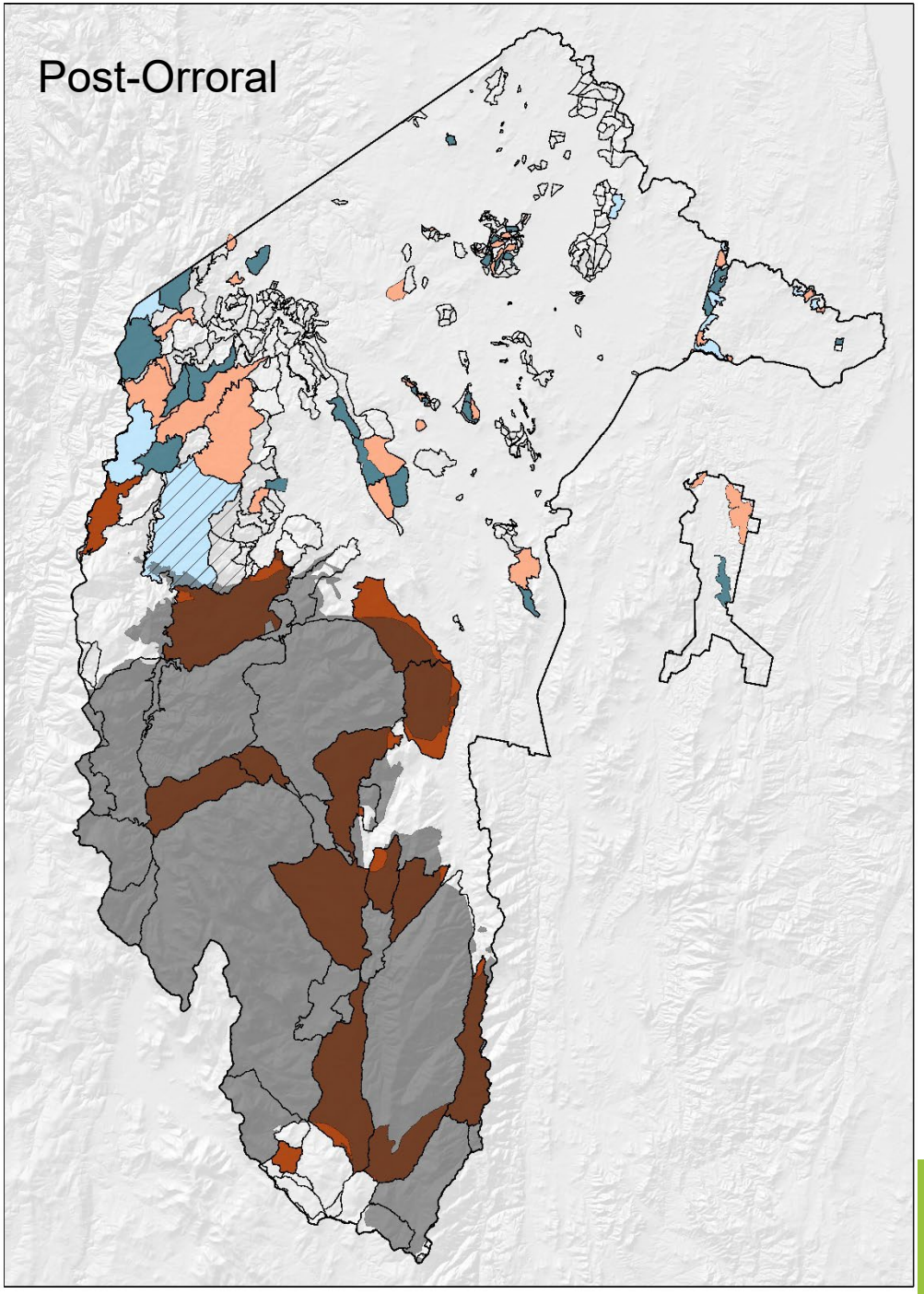




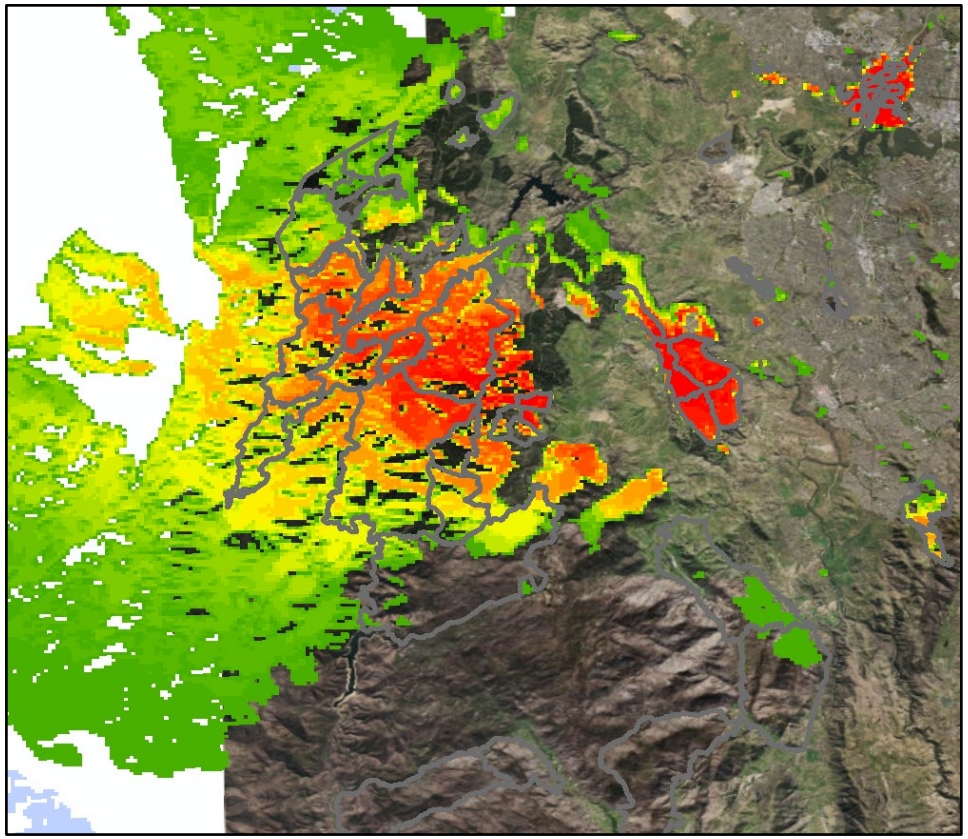


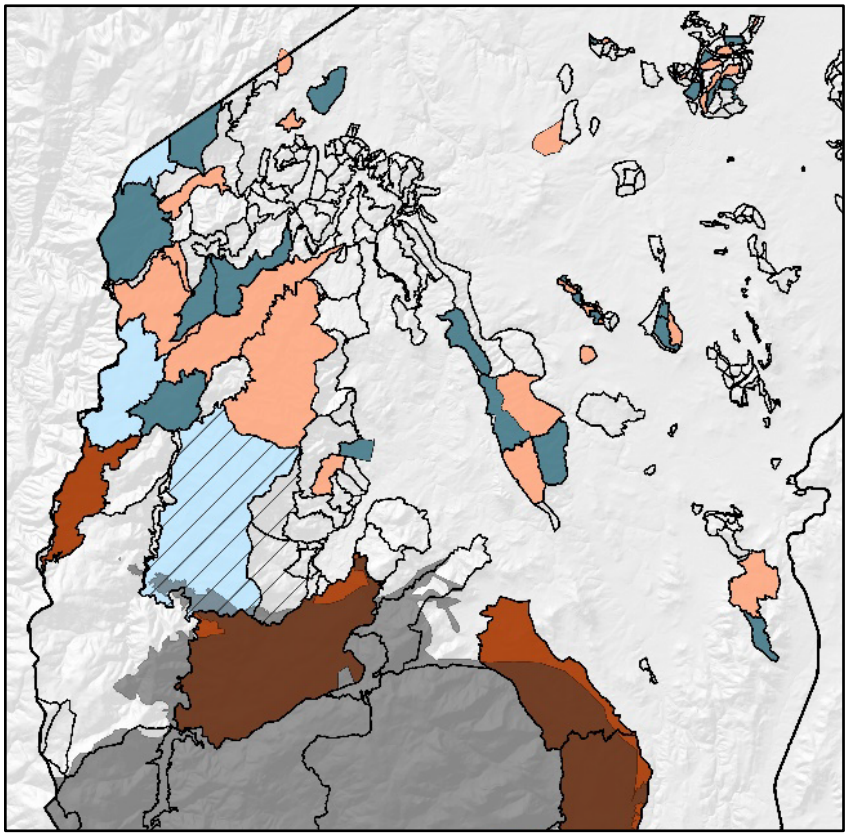
RFMP (Post-Orroral)

- Burns for period 2019 - 2023
- Possible burns for period 2024 - 2028
- Optional (if other burns can't be implemented)
- Remove
- Mt Domian: maximum burnable area
- Orroral Fire



RFMP Areas versus Risk Analysis





Burns for period 2019 - 2023

Possible burns for period 2024 - 2028

Optional (if other burns can't be implemented)

Remove

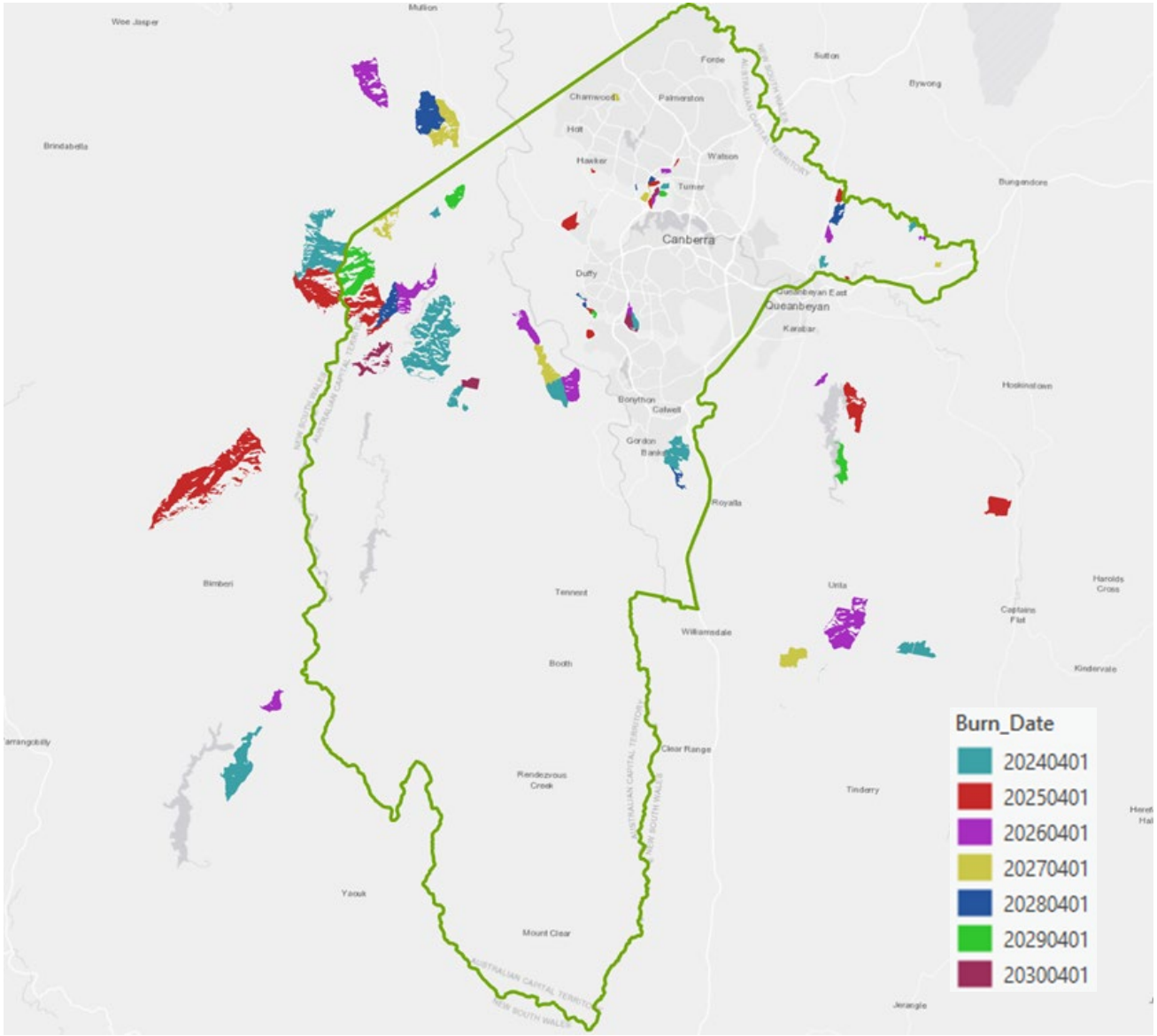
Mt Domian: maximum burnable area

Orroral Fire

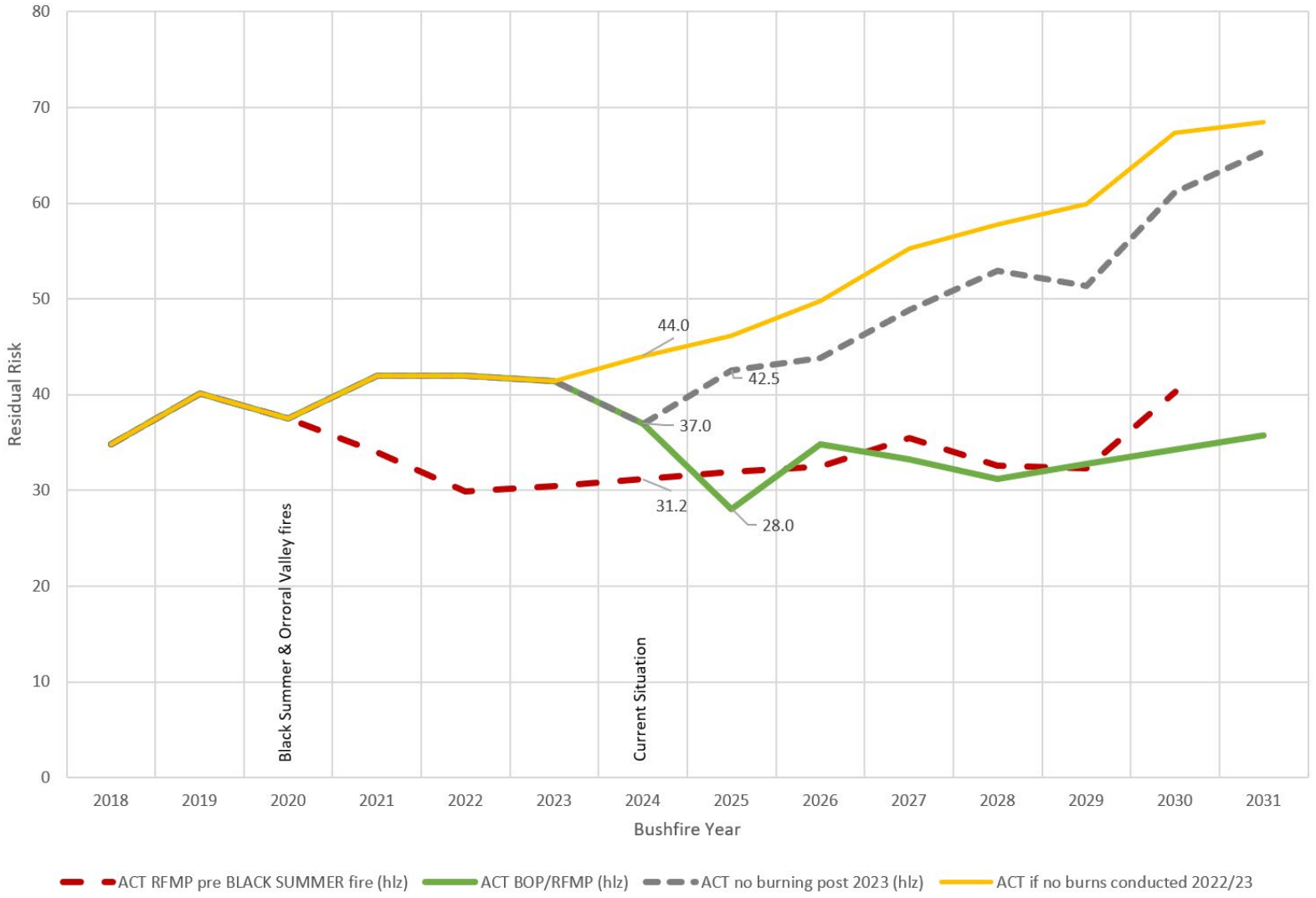
5.5

Scheduling RFMP areas

- Residual Risk calculations rerun after each Autumn burn program and any major bushfire events
- Include NSW proposed burn schedule

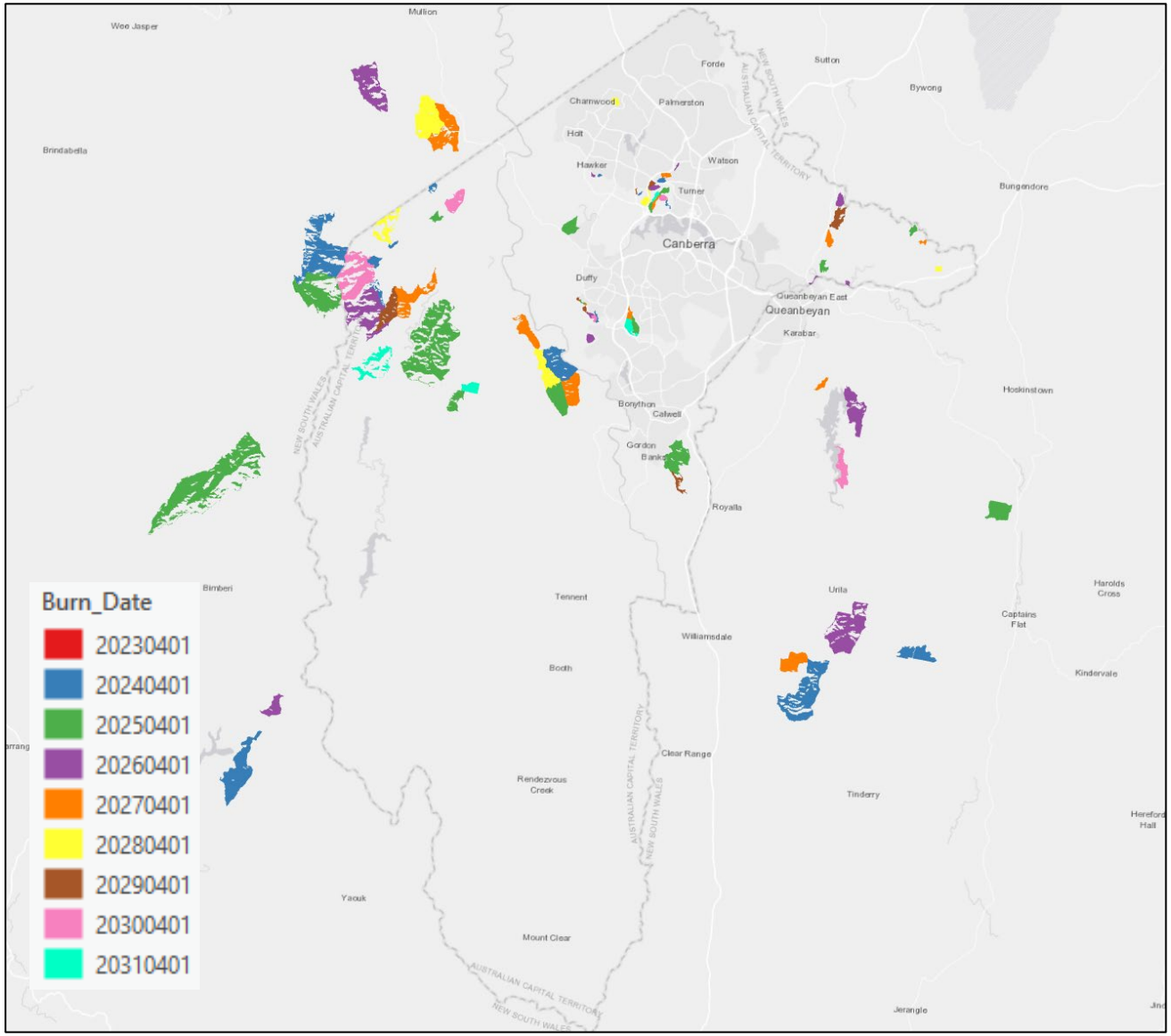


Residual Risk (ACT Address points) 2024

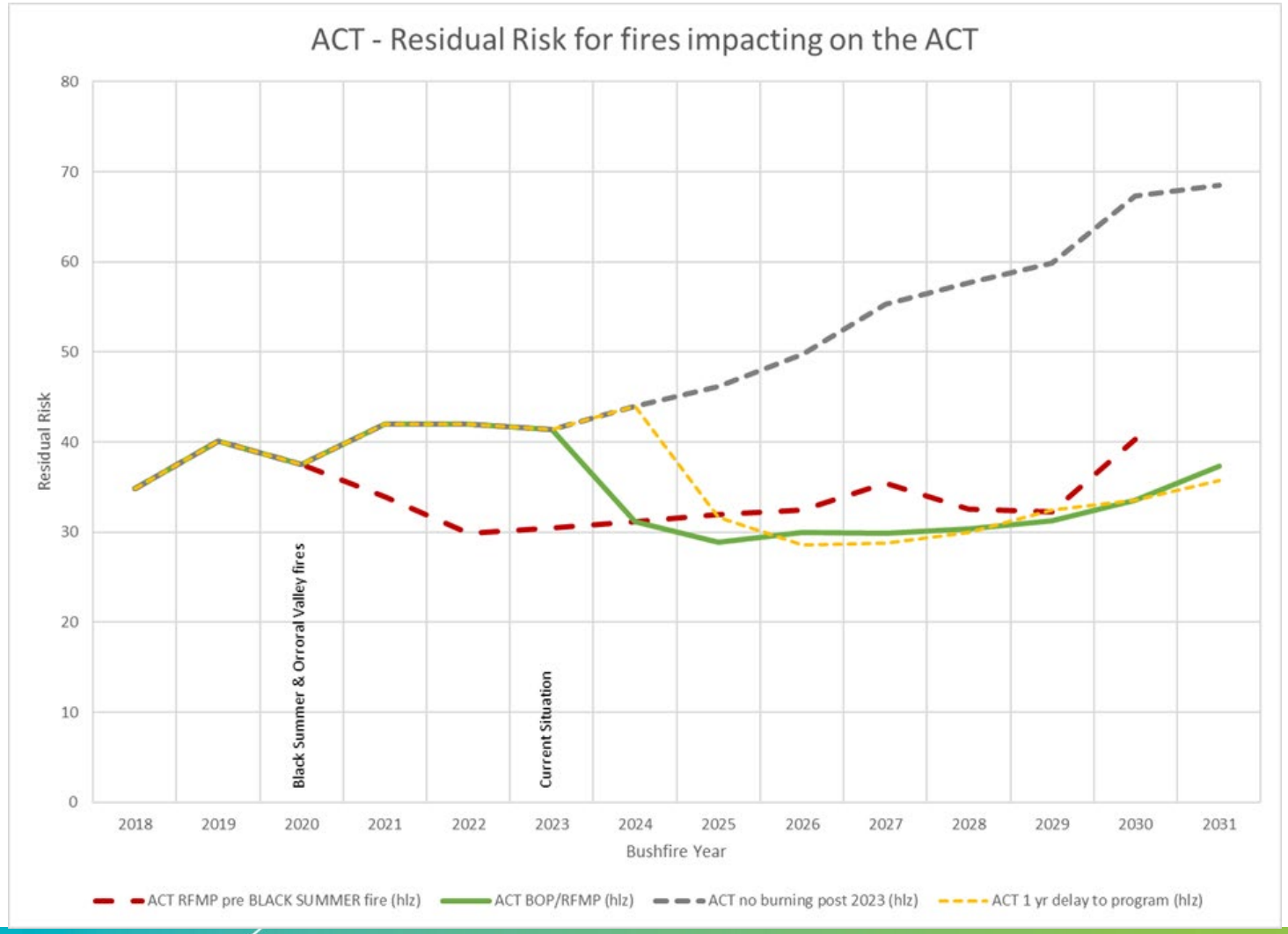


Scheduling RFMP areas

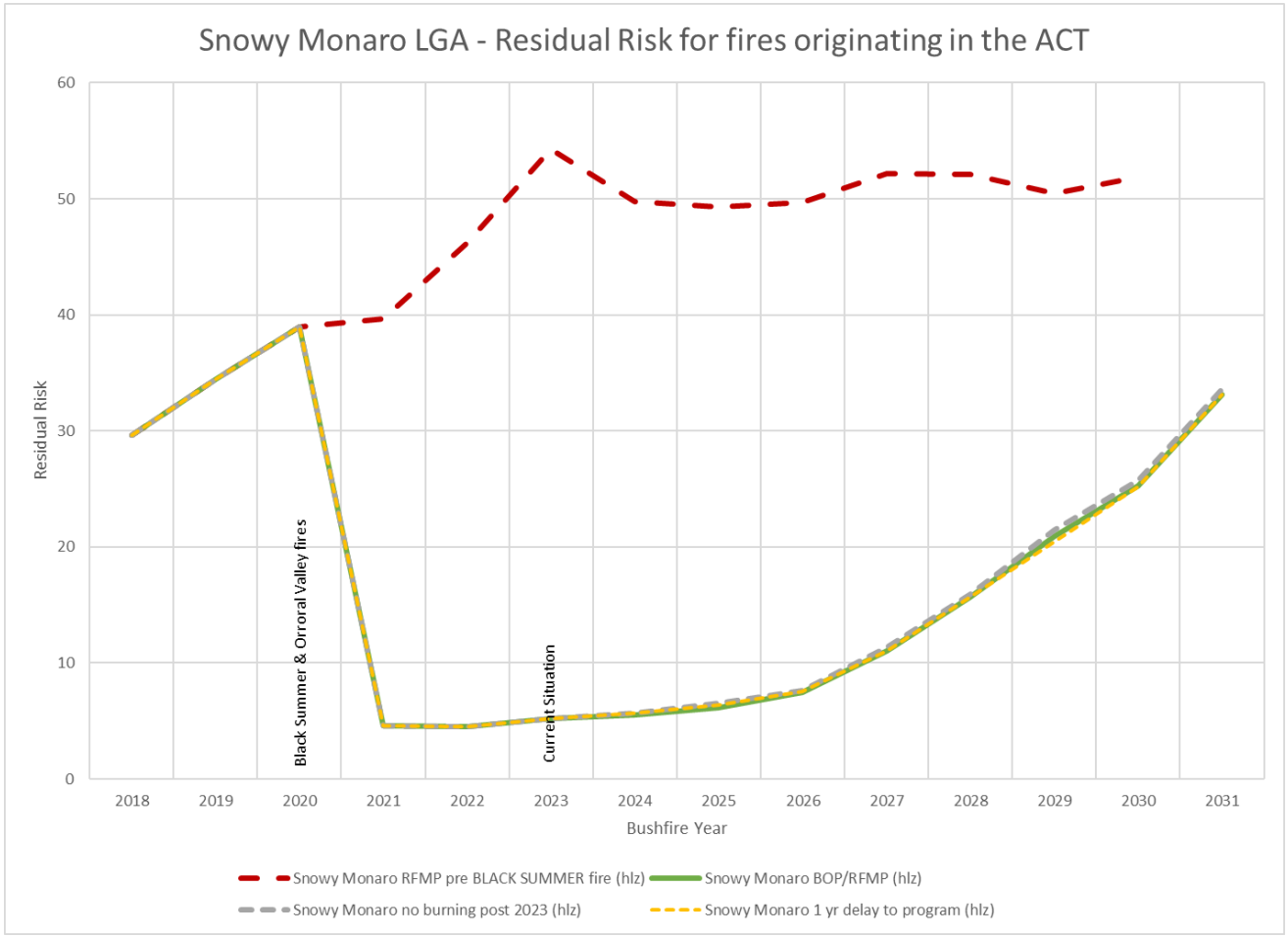
- What are the effects on Residual Risk if burning is delayed by one year?



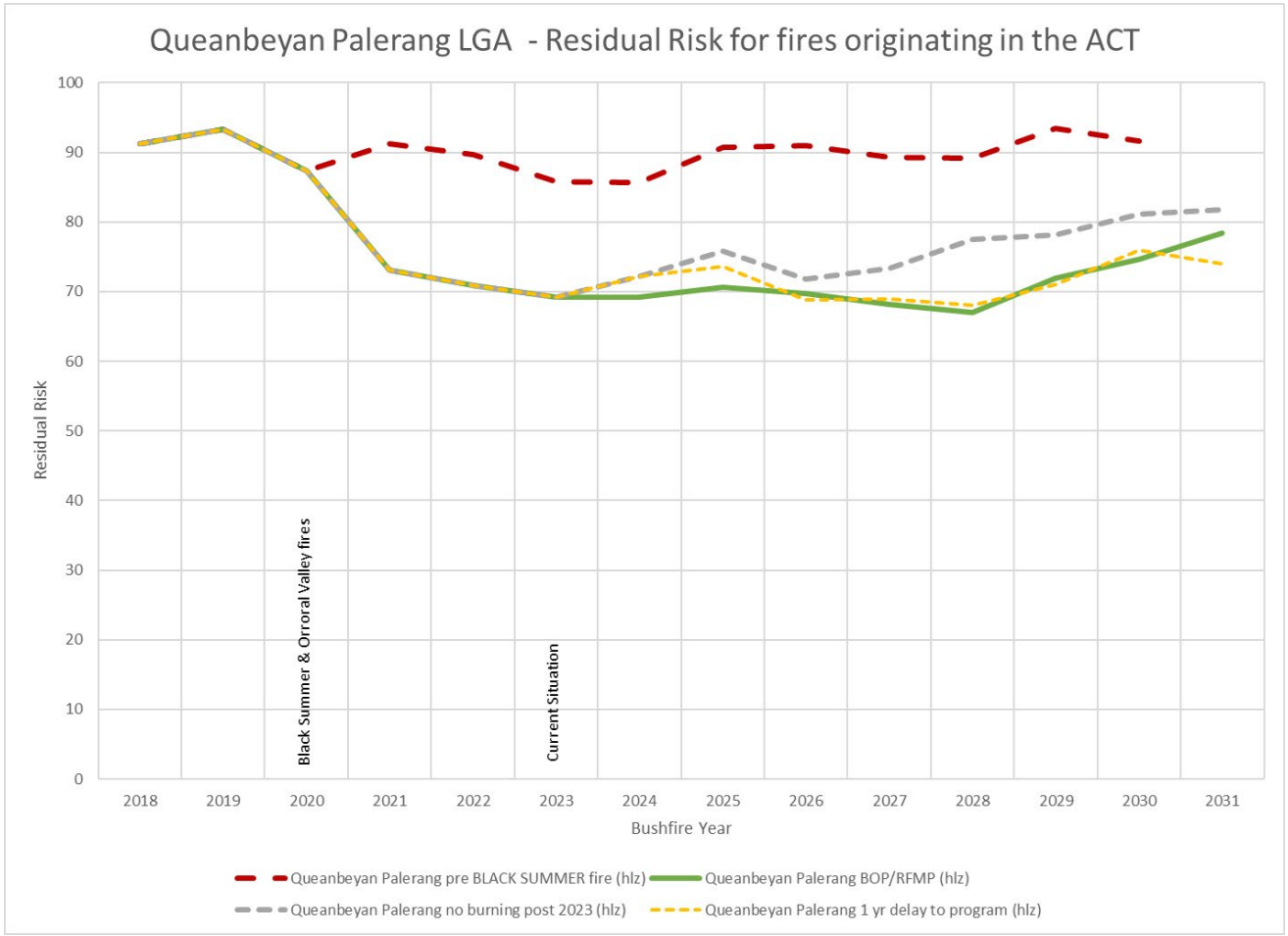
Residual Risk Analysis – 1 year delay



Snowy Monaro LGA



Queanbeyan Palerang LGA

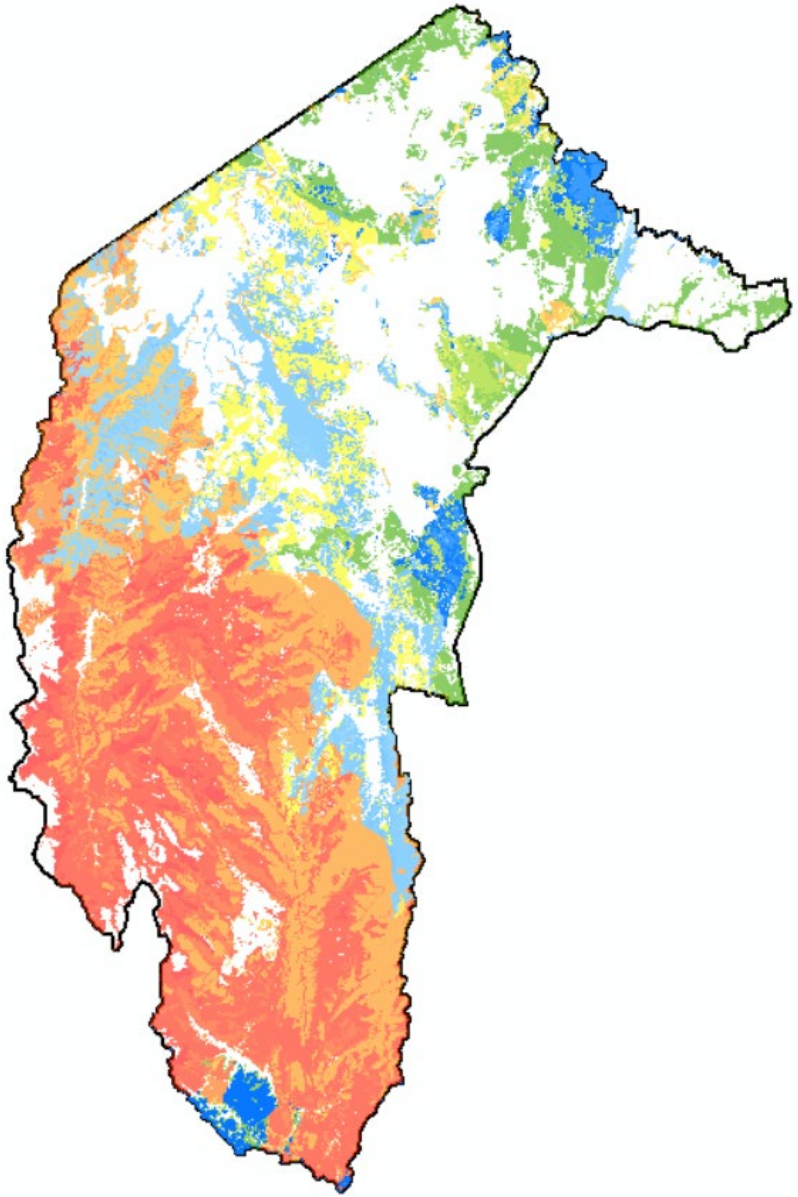


Considering Ecological Values in Fire Management

- EPSDD fire management program
  - Bushfire mitigation on EPSDD managed lands
- Conservation Research's role
  - Environmental input and assessment at multiple scales:
    - Strategic input – SBMP, RFMP
    - Tactical input – BOP review
    - Operational input – burn plan reviews, IMT & on-ground Values Officers
  - Monitoring & research
    - Post-burn reviews – adaptive management feedback
    - Knowledge gaps – impacts of both bushfires and planned burning in biodiversity

Conservation at the landscape scale
SBMP & RFMP

- Threatened and fire sensitive species and ecological communities
- Tolerable Fire Intervals (TFIs)
- Post-fire Growth Stage Diversity



2020 Tolerable Fire Interval (TFI) map

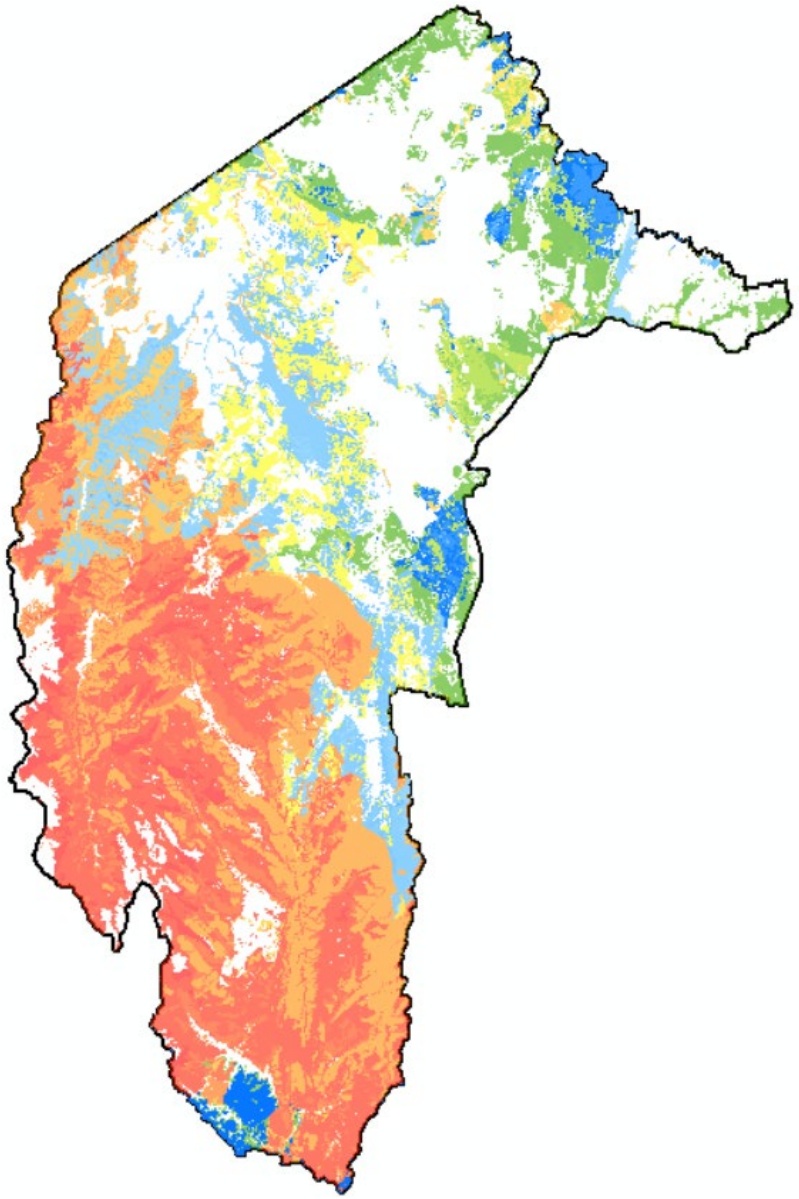
Tolerable fire interval (TFI) Status – 2020

ACT uplands:

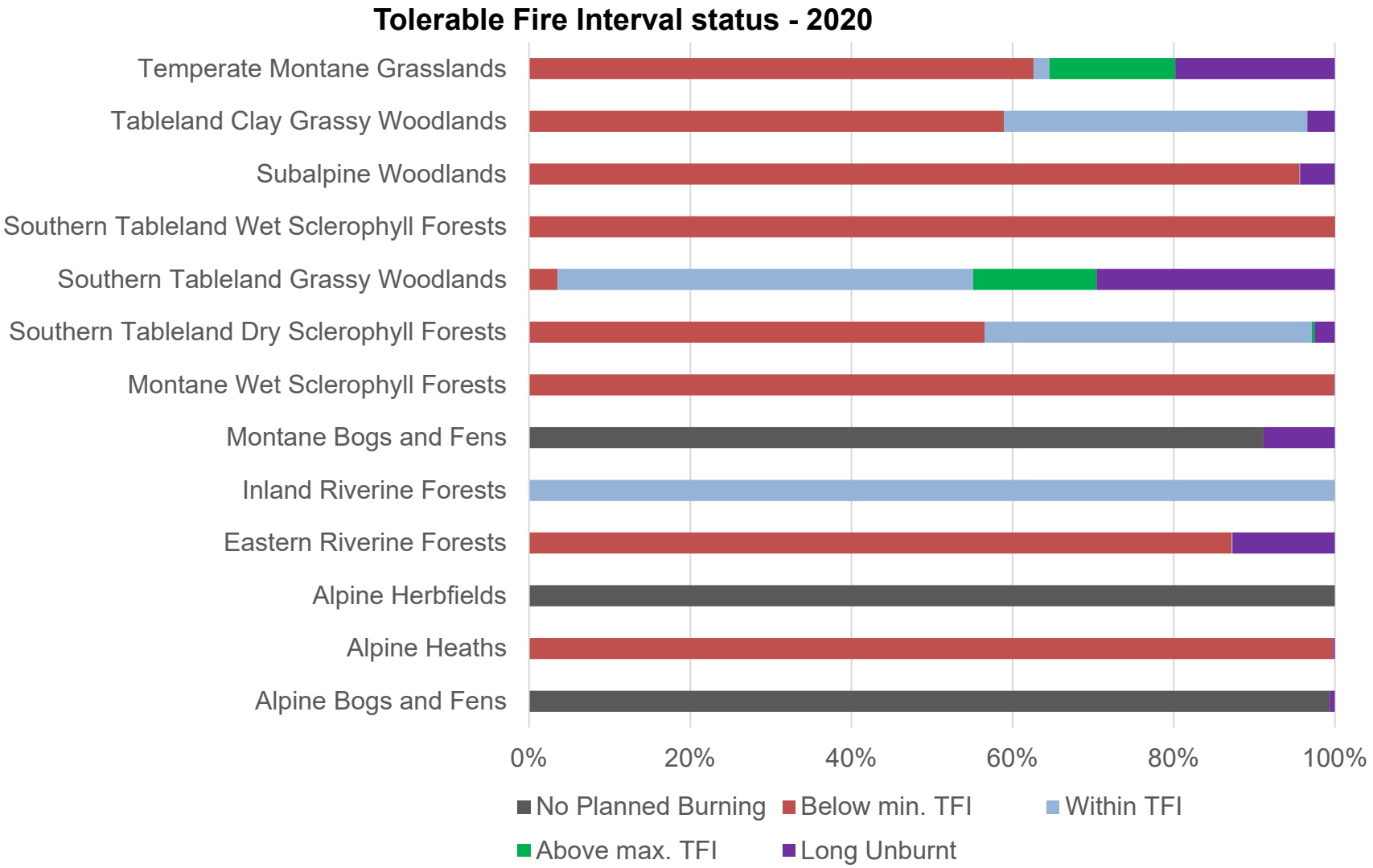
- Largely below min TFI
- Conservation estate

ACT lowlands:

- Largely above max TFI = ecological burns?
- Closer to built assets = higher risk
- Much of this is leasehold, but…
- Should more risk mitigation be focused in these areas?



Are ACT ecosystems within TFI post-Orroral fire?



Limitations of Tolerable Fire Intervals

Course tool -

- Treat all fire the same – do not consider severity or seasonality – probably overestimate prescribed burn impacts on plant species.

A floristic perspective based on primary juvenile period –

- Do not address the needs of fauna (vegetation structure and habitat values) – underestimate impacts on fauna.

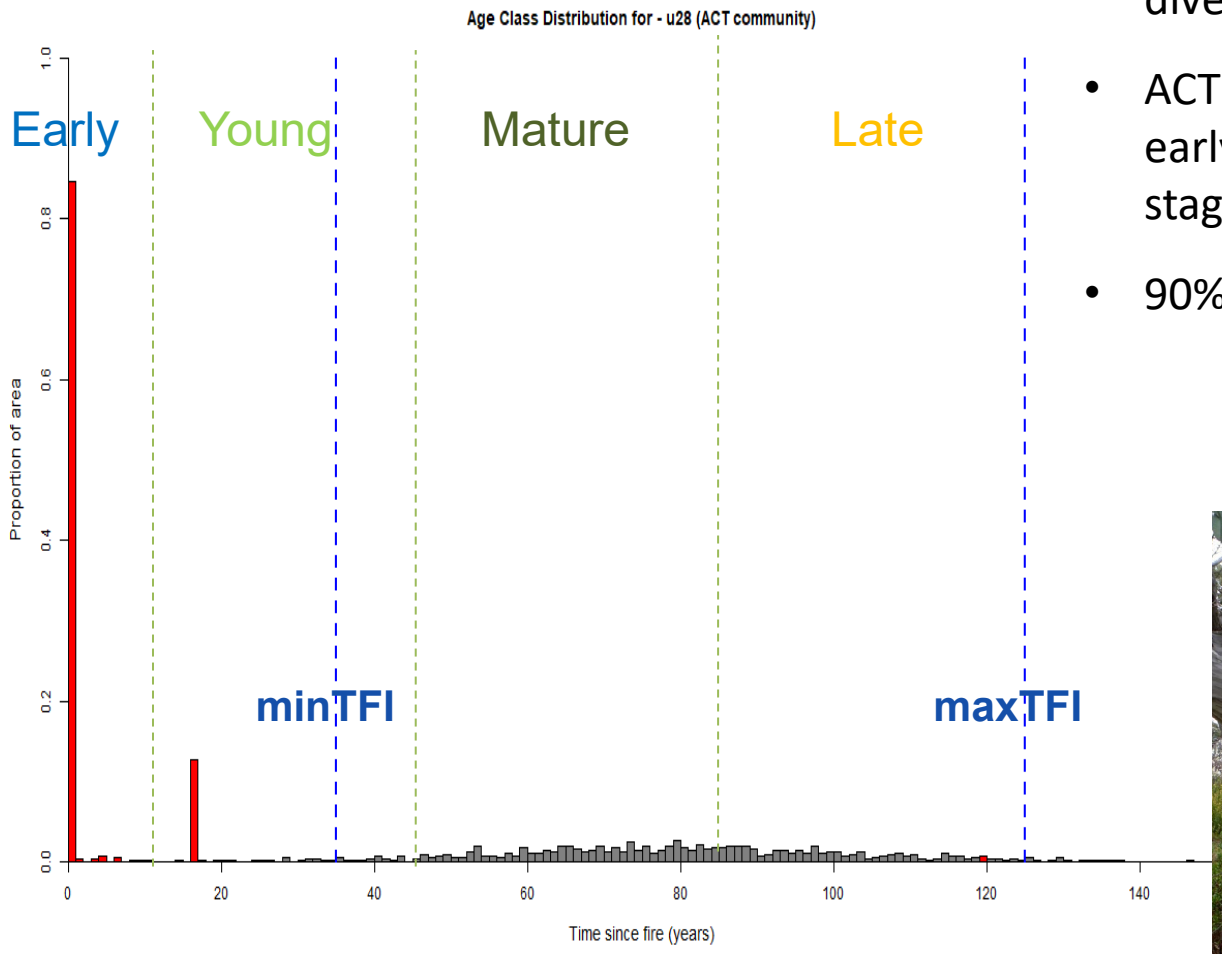
Alpine Ash regrowth from 2003

Alpine Ash regrowth from 1939

ACT Government

Alpine Ash min TFI = 80 years (was 25)

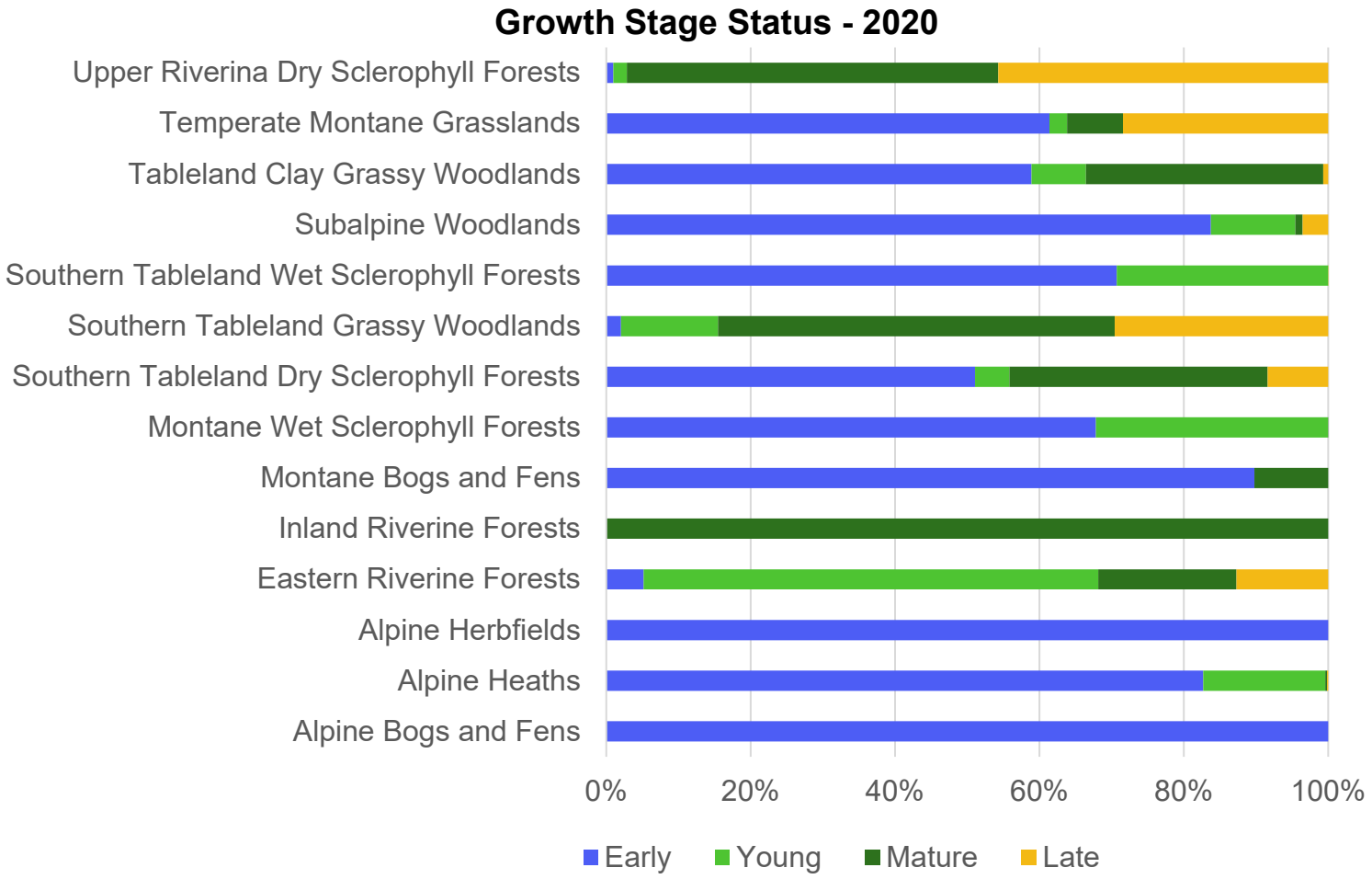
Growth Stage Diversity: a surrogate for biodiversity



- Growth stage diversity = habitat diversity = biodiversity
- ACT Upland ecosystems largely in early and young post-fire growth stages
- 90%+ below minimum TFI

Long unburnt or late growth stage Subalpine Woodland

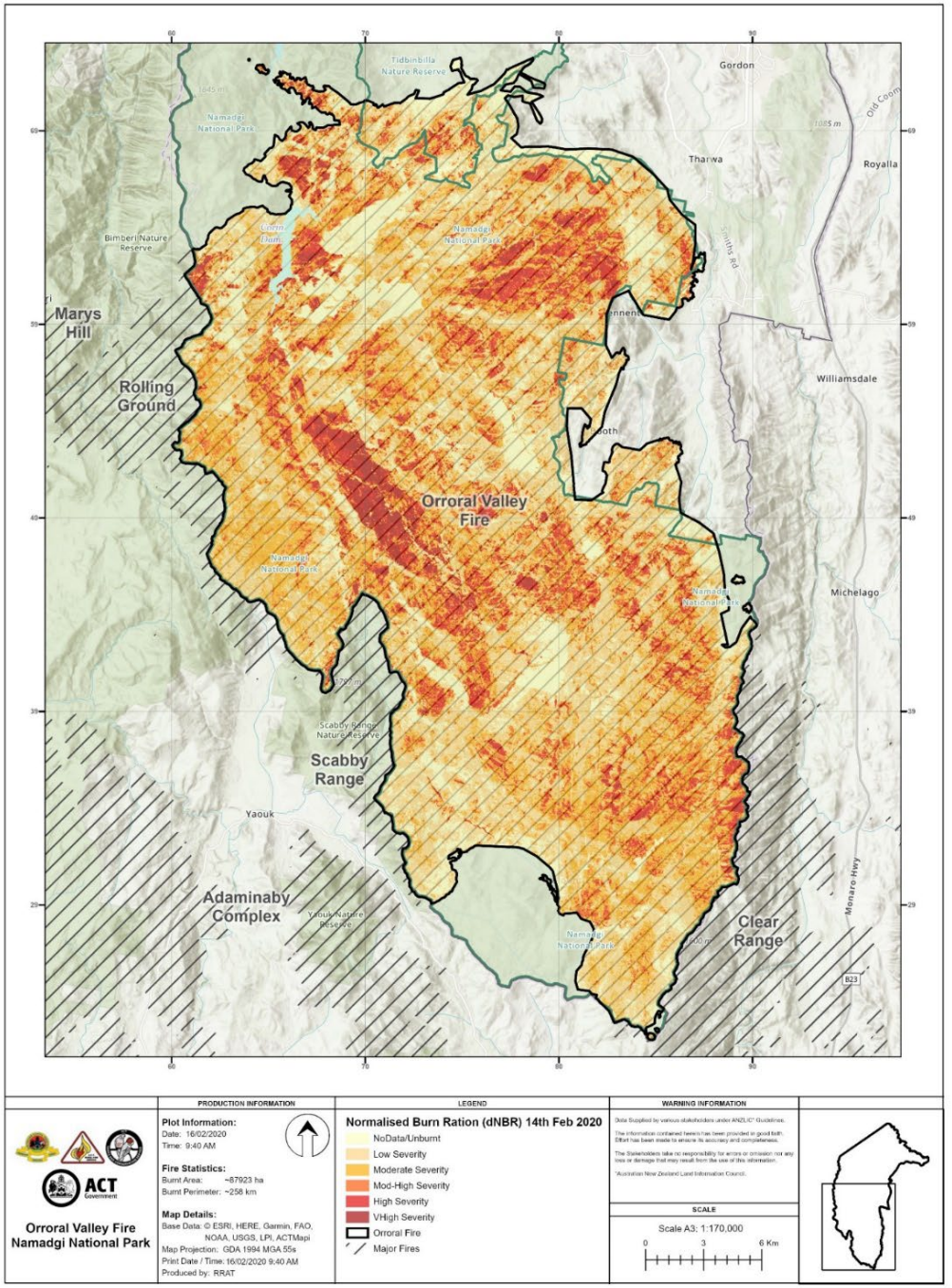
Do ACT Ecosystems Have a Diversity of Growth Stages?



Post-Orroral ecological review

Impacts of 2020 Orroral fire

- 80% Namadgi NP and Tidbinbilla RN burnt
- >90% overlap with 2003 fire
- Burnt 2+ time in <20 years
- Many vegetation communities had over 90% of their ACT extent burnt in the Orroral fire
- Upper Cotter River sedimentation
- Black Fish and Macquarie Perch declines



ACT Government

Ecological Review of the draft RFMP

Guiding principles

- Exclude blocks impacted in 2020
- Reduce extent of remaining unburnt to be treated over next 10 years (50% down to 35%)
- Prioritise blocks contributing most to risk
- Avoid ecosystems heavily impacted by 19-20 fires – esp. blocks that represent a large prop. remaining unburnt extent
- Minimise burning below TFI
- Minimise burns that risk erosion impacts to the Cotter River
- Avoid adjacent burns in back to back years
- Ensure scheduled burns are spread out over space and time