FIRE MANAGEMENT REVIEW SOUTHERN DESERTS

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Introduction :

A survey of the desert reserves was made in 1987-89 to provide fire management plans. At that time information regarding fuel age was considered to be of highest priority. Reports from that work presented the status of fuel ages and a priority for burning in each of the reserves. Following the attempt at Aero burning in Queen Victoria Springs Nature Reserve with varying results, we were approached by Goldfields Region to look at current burns and advise on burning models and strategies for hummock grasslands. After this initial period it is timely to review progress on the burning plan and reaffirm goals and objectives.
We saw our main aim was to;
1. Review fire management and burning plans for desert reserves.
2. Pass on current knowledge in burning hummock grasslands and instil confidence in the officers controlling and implementing the burning operations.
3. Reaffirm objectives for burning
We see the fire management aims in the desert reserves as to;
1. Break up large wildfire runs
2. Re-introduce a patch-burn mosaic of interlocking vegetation of a range of ages up to 50 years

Method :

Landsat imagery was used to identify the fire footprints left by aerial burning operations and wildfire's. An inspection in the field of the burns, an analysis of the methods employed and the meteorological conditions was done.
The fuel age plans were used to plot recent fires and plan a patch burn strategy for each reserve. Priorities for which reserve requires immediate attention could then be assessed.
It is obvious from inspections that all reserves are still vulnerable to large scale wild fires and that a considerable burning program is needed in order to break up fuels.

Results/Discussion:

Queen Victoria Springs Nature Reserve was the first to be assessed . The strategy for the aerial burning operation was to link several areas of wildfire on the north and east side of the reserve. provide protection from fire sweeping into the reserve from that direction. In seems to be no pattern in the direction in which wildfire's in the arid region spread. good barrier now exists and forms the basis on which to build a good patch burn his reserve.

An analysis of the area burnt from these aero burns has shown that a larger than predicted area was burnt and several reasons were identified for this ;
1. A strong wind of 30-40 kph lasting about 1 hour caused a significant increase in fire behaviour.
2. Flight lines were placed at right angles to the wind (procedure used in the forest)
3. Flight lines placed too close together (250m)
Where fires had failed to spread or carried only a short distance, conditions were assessed to be on the lower end of the prediction range. Either winds were too light or fuels very sparse or moist.

The objectives for burning in the desert reserves are to modify the vegetation fuel complex to provide a mosaic of different age vegetation. This is to be done under a patch burn strategy with burnt patches having a high perimeter to area value. Patches should ideally not exceed 100 ha in area with many patches smaller. Long tongues of fire are preferred to large burnt patches
Aerial burning should be carried out with flight lines parallel with the wind and lines about 500-1000 m apart depending on conditions. Where possible flight lines should be placed at right angles to the sand-dune ridges. Therefore burns should be delayed until winds are favourable for flight lines to be aligned.

A proper inventory of each reserve is needed which includes a detailed burning plan, fuel age plans, locations of wildfire's/dates, vulnerable plant communities, areas which need to be excluded from fire etc. We believe that this has been started but needs to be expanded and updated. Fire management and administration should follow the same standards, practices and protocols which are well established in forest regions.

Other reserves (Plumridge and Neales Junction) are in a flammable state and require a heavy burning programme to break up the spread of uncontrolled wildfire's. Neales Junction has had several large wildfire's in recent years (1987,1990) and has had one aerial burning operation in 1990. The reports from the aerial burning indicates a variable result also. In this reserve large areas of very old fuel exist (in excess of 40 yrs) These fuels are very patchy and sparse and may need the conditions increased to successfully patch burn to the prescribed level. It will be important to gauge the required increase in wind speed to achieve the necessary result.

The lack of accurate weather information was cited as a problem area and we advise that weather measuring equipment should be obtained to monitor weather onsite, immediately prior to and during burning operations, and observations passed to the Met Bureau. With actual data from the site, forecast accuracy can be significantly increased and actual spot forecasts should be sought from the bureau as is practised in forest regions..

The logistics of burning operations so far from base always pose a problem. However, the system proposed of upgrading an airfield in or close to each reserve and allocating about 1 week for the operation, allows a ground crew and air crew to be mobilised at a minutes notice once conditions are right. This gives the option of having several ares in the reserve to be targeted in one years operation.

Recommendations :

We welcomed the opportunity to assist in planning burning strategies for the desert reserves, and thank Kalgoorlie Region for inviting us to review burning operations undertaken so far.

In general aero burns where fires have spread freely have caused large areas to be burnt which have exceeded the objective. A strategy of placing flight lines parallel with the wind may have had a more desirable result, aim for long tongues of fire.

A set of operational guidelines for hummock grasslands need to be developed in order to assist with planning burns. These should comprise the practical aspects of the operation as well as contain the burn objectives. This would then form the a basis for reference for any new staff becoming involved in this type of work..

We endorse the strategy proposed for carrying out burning in 1 reserve each year . This approach will ensure that all reserves are covered and that over time a diversified mosaic of fuel ages will result.

Further work is required to properly document vegetation, fire, both prescribed and wildfire's, sensitive areas etc, as an aid for reserve planning.

Conclusions :

1. QVSNR is adequately protected and does not need protection in the medium term (5 years)

2. PLNR requires strip burning in 3 cells; the North West, North East and South West sectors.

3. NJNR a two stage burning is required. The Very old fuels are breaking down and will only burn under high winds. When on the job, target younger fuels (<40 years old) when conditions are mild (fuel cured and wind speed 15-20 kph) and when winds are higher (>20 kph) target old fuels.

4. Run flight lines with the wind and about 1 km apart.

5. Where possible, run fires across dunes

6. Use existing recent fires to lock in aero burns.

7. Rule of thumb for cured spinifex (yellow/green) spinifex;
   - spinifex height = top of boot height, need winds >20 kph
   - spinifex height = mid shin height , winds 15-20 kph
   - spinifex height = knee height, winds 10-15 kph

8. Set up electric weather station (see Uni Data systems - about $2000) to run just prior to and during burn operations.

9. Maintain manual weather observations at 2 hourly intervals (see Gerry Van Didden, Protection Branch, for details on weather obs during Gibson Desert trials)

10. Relay weather obs to Ocean Routes or Met Bureau for spot forecasts.

11. Monitor fire behaviour, etc as per aero burn in forest regions.

12. Establish professional fire management and operational protocols as per Forest Region.