

STOP THE TOAD

KEEP WA CANE TOAD FREE

Transcript

STRATEGIC FORUM
(via video conference)

21 February 2006

stopthetoad.com



BACKGROUND

The following is a generalised transcript/summary of the STTF 'Strategic Forum' video conference held on 21 February 2006. For the sake of brevity some comments have been paraphrased and little of the dialogue is recorded verbatim. To verify remarks or see whether more detail is available on any particular theme please check the DVD recording of the video conference. Nb. "(#.##.##)" references are to timeline on DVD.

PARTICIPANT LIST – QUICK REFERENCE

<u>Perth</u>	<u>Kununurra</u>	<u>Townsville</u>	<u>Darwin</u>
MB - Mike Bamford	GG - Gordon Graham	RA - Ross Alford	GF - Garry Fischer
DB - Dennis Beros	GM - Gae Mackay	LS - Lin Schwartzkopf	IM - Ian Morris
WK - Winston Kay	GS - Graeme Sawyer		KS - Keith Saalfeld

Permission given for meeting to be recorded. Dennis Beros is facilitator.

(0.02.16)

DB - Firstly, thank you all for your time today. At the Stop The Toad Foundation we believe this process (and any others that may flow from it) are critical to whatever chance of success we have in stopping or slowing the toads westward march across the top. So thank you sincerely for participating.

INTRODUCTIONS

PERTH

- Dennis Beros (DB) – acting coordinator of STTF. Perth based.
- Dr. Winston Kay (WK) – CALM Program Coordinator for the State cane toad initiative since 2004, an ecologist.
- Dr Mike Bamford (MB) – independent chair of the joint coordinating group, self employed wildlife ecologists works for mining companies and CALM, invasion of intro species.

KUNUNURRA

- Gae Mackay (GM) - Regional Manager for CALM Kununurra, providing input from Kununurra point of view for the WA government cane toad implementation strategy.
- Gordon Graham (GG) – CALM Regional Leader for Nature Conservation in the Kimberley, was heavily involved in setting things up with cane toad initiative and getting actions underway.
- Graeme Sawyer (GS) - Regional Coordinator for STTF, representing Frogwatch also, has been working on cane toad issues with Ian Morris in Darwin for a long time, principal expertise in cane toad trapping.

Observers

- Derek Monk – Operations Manager FOR STTF in Kununurra working full time, hosted at CALM offices.
- Errol Kruger – newly appointed cane toad coordinator for CALM.

QUEENSLAND

- Assoc. Prof. Ross Alford (RA) – working on Cane toads since 1986, mostly working on ecology of cane toads. Had a PHD student look at impacts of cane toads on aquatic animals and their interactions, currently doing work on attracting cane toads into traps more efficiently using smells (not looking promising) & sounds (looking quite good).
- Dr Lin Schwartzkopf (LS) – radio tracking adult cane toads to find out more about their movements - why and where. Thought it would be useful for epidemiology, currently working on attractants for trapping program to make it more efficient.

NORTHERN TERRITORY

- Keith Saalfeld (KS) - NT Parks and Wildlife, one of the principal management officers setting up NT activities and cane toad management program, significant role in setting up NT activities particularly in the last 12 -18 months.
- Garry Fischer (GF) – NT Parks and Wildlife. Chief district ranger for Victoria River District, throughout the focus on the cane toads and their movement to WA. Been involved with cane toads since they arrived into Katherine, and now the VRD; involved with CALM & KTB, has strong liaison with CALM, knows most of the people involved
- Ian Morris (IM) – representing FrogWatch, since 1991 looking at frogs and public education about native frogs, particularly through schools. Cane toad in territory since 1991 so cane toads have high-jacked FW agenda, spend most time strategising to minimise cane toad impacts. Keeping out of Darwin, mechanical focus recently.

REVIEW OF PURPOSE

Purpose (as distributed in preliminary materials):

To provide technical advice, inform and guide on-ground cane toad control operations in the Northern Territory with the aim of defending the Western Australian Kimberley region from infestation. This could include advice on:

- *the ecology/biology/behaviour of the cane toad*
- *the terrestrial and aquatic environments that the front is passing through*
- *land tenure and legislative settings*
- *past experience of cane toad control measures*
- *studies and other resources which may assist*

DB - Today is about the toad and the country it is moving through. It is about really understanding the enemy – in situ! STTF are viewing this as a military-like campaign. You are one of our principle sources of intelligence (knowledge) in the planning of that campaign.

The STTF is asking the question – can the enemy be stopped? The answer must be, to some extent, 'we won't know until we have tried'. The question then becomes – how would you design the best – most intelligent – most informed – best resourced - TRY at stopping the toad? And that is what we want from you. We want you to help us answer that question.

Today I ask you to tend to forget about constraints – esp. budgetary and logistical constraints. Please - for the moment forget all constraints – EXCEPT the constraints of the country, the weather and the toad. Let us allow ourselves to believe that human matters – boundaries, finances, political will and goodwill, people power – these things can be shaped overcome - these are the only things that we can control.

THE STTF board membership (which includes as you know Tim Winton and Luc Longley) attitude is - if we are going to have a go at this, let's have a very good go!

I ask that you approach all the issues/questions before you today firstly from that IDEAL unconstrained perspective, then secondly (in the event that we cannot overcome all these human obstacles) a little more realistically, because there may be real and useful solutions there also.

AGENDA REVIEW

The agenda was reviewed and a matrix of the issues had been circulated prior to the conference.

ISSUE RAISED ~ PERMITS FOR VOLUNTEERS IN NT ~

KS – It has been brought to my attention by GF that there are growing problems with the volunteer activity in NT at Timber Creek – permits not being acquired - lack of awareness by NT PW staff of what volunteers are doing. This is not the forum for this but all need to see that this is a key issue. This issue is developing and we will need to address it ASAP.

GS – We see it as a key issue too. Now that Derek is on board he can sort out & ensure this doesn't happen – Derek will follow it up. This is a key issue, this is a specific responsibility. Make sure that Kimberley Toad Busters (KTB) are carrying out all that is required.

KS - very happy with CALM & what happening there. They have addressed any issues that we have

GM – we are happy too

DB - STTF will not have any activity happen under it's auspices without correct permits, insurances etc. We will continue to encourage all community groups to play ball.

ACTION – STTF to encourage KTB to operate under NT P&W permits

ISSUE # 1 – Where is the Cane Toad front now?

DB – It is vital to understand where the enemy is and given that we are in the middle of a wet season this question will not be not be easy to answer. GS has recently returned from the region and has some news so I will ask him to lead off. I will remind participants what we are trying to consider the 'entire' front in these deliberations.

GS – We followed up on leads from CALM and Kimberley Toad Busters (KTB). I would put the front (level with highway) 17Km to West of Timber Creek, along Gregory Tree Rd turn off. Not huge numbers there yet but there are toads from there back to Timber Creek, along the road corridor and from the road back into to the river. South of highway not 100% sure but the KTB group that went to Jasper Gorge didn't find any. Errol's team got some not a huge distance south but quite a long way the west along the road/river complex. If they move through this area and toward the East Baines catchment they have moved into an area where the road and the river diverge and this has implications for reconnaissance.

Nth of hwy – over river to Bradshaw it is very unclear. I'd expect them to be that far (possibly further) west because we were getting a lot of reports from that area before the wet that's level with the Victoria River Bridge. Not even road workers have been in there since the wet season, workers on Bradshaw got evacuated because of the rain.

(0.33.52)

Toads and tadpoles found on the weekend near of Gregory Tree Road turnoff (Comments from LS – this means they may have been there a while)

WESTERN MOST OBSERVATION OF TOADS TO DATE.

There is some conjecture as to how continuous the front line is from Timber Creek to Skull Creek. Certainly Toads found at Timber creek and around that area – infestation makes this frontline(ish).

DB – In the northern areas – where are they?

GS - North of Bradshaw – there's no one out there (no stations etc) there may be Military people out there. Only possible lead - Northern Land Council, Caring For Country people out of Timber Creek – men's & women's groups doing weed control on Bradshaw (with Quad bikes) – not sure where they're doing work but likely east of settlement rather than on the western side.

One of the key questions is how far have toads have been swept down river in the latest floods? Banks of Victoria River are very bare. When river has gone down there's an opportunity to do some surveillance.

Action – Urgent BOAT SURVEY of Vic

DB – In the northern COASTAL AREAS – what is known about the areas up there?

GS - Not much known, a lot of wildlife but surveyed only by military and private contractors. We should assume that toads are right across that area and may be pretty close to the gulf.

Question – How much of a barrier is the Victoria River for the cane toad due to the salt level, how does it get breached by the wet season fresh water flows, how does this affect their behaviour and salt water tolerance?

KS – In the late 1990's cane toads colonised off shore islands (Sir Edward Peloose NT, some islands adjacent to mainland and some further 12 - 15 km off shore). The information is anecdotal but clear that it was one single big flood event. The islands went from no cane toads to colonisation so they got there at the same time, not by island hopping. During these big wet flooding events it becomes near fresh surface water so as well as toads being able to raft, they can also swim it. No hard data tho.

RA – Cane toads have colonised offshore islands in Qld. When the rivers flood the freshwater goes over the salt water. Toads have no problem with this and can then navigate anywhere. Found a couple of kms offshore (Cleveland Bay). Have found live CT tadpoles in estuaries with 40% seawater concentration, alive but not thriving. Adult toads could swim across a moderate expanse of salt water. Sitting in salt water would eventually kill an adult toad but it could take a while. You need a lot of salt water to be a barrier!

KS - 12ppm salt water (about 40%). Agrees salt water barrier is not realistic for the coastline. Re coastal colonisation north of Bradshaw, NT Parks & Wildlife have no confirmed reports on coastal strip from Port Keats down to the mouth of the Fitzmaurice River.

GS – We had one report from down that coast a couple of weeks ago, not at Port Keats but at Palumpa and perhaps one other place down that way – but that's still 30 or 40km from Port Keats.

KS – That is consistent with our best information but what is happening on that big southern Daly land trust area – I don't think anyone knows.

WK – [Shows satellite image] This image is of a May 2005 flood plume from Victoria River out to Keep River and Cambridge Gulf (crossing WA border). Potential to sweep down adults, tadpoles etc which would put this area at risk from colonisation. All agreed.

KS – Just north of the mouth of Victoria River there is also the mouth of Fitzmaurice, feeding off the top of Bradshaw (northern boundary of Bradshaw) and the bottom of the Daly River, this is also feeding into Victoria River flood plume. So anything addressing the Victoria should also be addressing the potential of the Fitzmaurice River to contribute.

GS – Question to RA: We noticed with KTB, toads using Victoria River as a refuge particularly where there is a low level crossing (rock bar or sand bar) and not much fresh water. Is it a fair assumption that CT are not going to be able to do this when it's high level salt ie will have to move off the Victoria River during the dry season from Timber creek down?

RA – True. They cannot use water that is 50% salt and anything down to around 20 % salt for a long-term refuge. But these look like complex systems and there may be other fresh water refuges available near the river.

(0.50.30)

GS – Agreed, but if we don't have to worry about the Victoria as well then the battle will be a whole lot easier.

GF - In terms of getting out there and controlling toads, the Victoria is the least of our worries. It's the refuges along the Angalarri, Bullo River, Murri Flood plains back up through the Keep, Legune & other areas extremely difficult – there would be 100's of refuges along those water ways.

Toads on Bradshaw confirmed on the back on the Ikymbon River and unconfirmed on the Angalarri River. If the CT's have come down the Angalarri then there is high likelihood that they are already on the Auvergne flood plains. Just because they have not reached the hwy doesn't mean they are not there. River systems are providing the fastest pathways, not the highways as has been the case in other areas.

GS – I don't think there any doubt about that – the river is definitely the corridor.

GG – We need to look at refuge at areas other than open water bodies, scree-slopes around rubble, at base of low cliffs and anywhere there is a moist humid environment. We noted the question of the sudden increase in numbers at Joe Creek, which may have come from rubble areas in the cliff face where there are seepage sites. It is not just open water bodies that need to be added to the list

RA – Agree - favoured habitat is not just bodies of water. We did a radio-tracking study in 1980's on Orpheus Is where CT's favourite bit of habitat was a scree area where fresh water seepage was occurring. This is where they were in the dry season. Lots of toads there.

Issue # 1 - Summary

DB – In terms of answering the question 'where is the Cane Toad front now?' we know a few things but there are clearly a lot of questions unanswered. We didn't know where the front was before this wet, we certainly can't know now in the middle of a wet season. Some useful information has emerged but educated guesswork is what we are left with. Suggest move to 'worst case scenario' section.

ISSUE #3 - Where will the cane toad front be by end dry 2006 – worst case scenario?

DB - As this wet recedes, we need to know where front is to have any chance of tackling it.

KS – Agree. Work out the frontline first at the end of wet and then work back to control.

DB – Given what Garry was suggesting, is the worst case scenario that we have toads in Bullo, Auvergne and Legune?

GS – You want to take that right to the coast, anywhere the flood plume hits, right down to the mouth. 112 Km from Timber Creek to the mouth – well within range of toads in a flood. They can travel far in flood as they did in NT on Adelaide River from Flotilla flats to the Adelaide River bridge in short flood.

Therefore: CT could reach the mouth of the Victoria from Timber Creek in a flood.

A technique that can even be used in the wet season – in any area you can land a person (by boat or whatever) is listening devices eg. use of shot-gun microphones to conduct surveys – now a good time while they are calling – warm and water around. Won't confirm that there are no toads there but will confirm for you if they are (as part of Victoria River survey)

ACTION – explore use of shot-gun microphones to conduct surveys asap

RA – An efficient, cheap & good tool we've used for 15 years is a cheap tape recorder with timer in ammo box. Cost \$200. Take out helicopter, could drop 100 of those out in field, and then pick up. Record 1 min per night eg. Another is tadpole surveys – go out in helicopter – do broad survey to find out where they are - dip net. They cannot hide and can be seen from afar. Could do a broad survey and hit a lot of sites quickly. Esp right at end of wet when reasonable to expect tadpoles. [0.59.00]

ACTION – explore potential for helicopter surveys utilising long term recorders perhaps combined with tadpole surveys.

DB – How do we get people into these difficult areas – like the upper reaches of the Victoria and the coastal areas of Legune. We are keen to explore all possibilities – can we get people in using kayaks, horses as well as boats and helicopters? Lets explore how we might go about determining the reality of the situation quickly and efficiently at the end of the wet season.

GG – Up stream of Victoria River Bridge it is very inhospitable country going into the gorges. As an early warning location, Jasper Gorge has been repeatedly mentioned. If toads are moving as rapidly as we are predicting under worst case scenario then we need to focus on areas where the catchments switch from east to west – once in here that's where trouble begins. Clarified: eg. systems that run into Lake Argyle. They could get in to WA this way whilst everyone focuses on Kununurra.

DB – So we are indeed working on a massive front. From the northern coastline along the entire western shore of Vic, up Paperbark Creek and other likely incursion thrust points; probably already in the East Baines and we need to look at the systems that feed into the Argyle.

GG - Water catchment mapping needed (where are they in relation to that switch from east to west flowing systems)

GF – Catchment mapping has been done on a broad scale through VRDCA. It is important to determine how fast CT's would move up a fast flowing stream. Tadpoles are not going to be swept upstream and toads will also be moving mainly downstream in flood situation.

Cannot see them moving fast up the East or West Baines, or the Wickham or the Victoria River. With these 4 rivers the toads will have to get right upstream before they can get across into the Ord catchment. The real movement is going to be down through the Victoria and across the flood plains as to where they'll be at the end of the wet season. And we may have more rain yet.

ACTION – Catchment INFO available – may require additional survey/water catchment mapping

LS – It is not the tadpoles but the adults that colonise. Adult toads can easily move upstream and do so all the time. Also move across country when its wet.

GF – Primary potential is for them to move downstream during that large flood plume (10,000cm per sec flow in the Vic). In this way they could move over 100 km, during a single season.

RA (and LS) – Adults moving on those plumes are the big problem. Don't forget that it is entirely possible for adults to disperse 50 km a wet season, without any real problem (nb. individual adults). Presence of a river provides a highway, but they move across country too, and any little tributary or depression also channels them.

GF – For toads to move from the Victoria River up to the west Baines is in the order of 120kms. This is the quickest way they are likely to get back across into the Ord.

DB – West Baines tributaries come very close to the feeders into the Ord river. Toads using the wet to get from one river system to the next. The Baines will have water in it until the water dries and leaves pools of water. Depending how far west the toad has come during this wet and the life of the supporting bodies of water to enable the toad to get right upstream and close enough to the Ord system. Is it possible for them to make it there this wet season?

GS – Unlikely, but possible with hitchhikers. TOADS can go 50 – 80km up a water catchment in a season, but they can further go a lot down a water catchment. If CT's just getting into East Baines they may go a further 20-30kms up the Baines this wet season but to get to across catchment lines into systems that flow west into Lake Argyle, you are probably talking about 2 years.

RA – Estimate of 2 years sounds reasonable given the map I have.

GS - Once country dries up (3-4 weeks after rains stop) ephemeral water holes vanish quickly, buffalo wallows and creek lines still holding water for 1 month, then the creek systems start to break up into discrete water holes. In the Baines the further back up the catchment the quicker this happens because it is sandy/limestone/mixed country and those tributaries up the top are scarce for water once you get to July – August. So perhaps a narrow window for toads to move, but toads could refuge in these areas on the water holes and then use next wet to break out.

DB – Is this area then a better buffer zone than ones we have been looking at?

GS – One of the best buffer zones I'm aware of is the East Baines flood plain – in dry season easier work getting toads off this area. If they get out of the East Baines into other western river corridors, then that presents a raft of problem for dry season strategy for 2006.

RA – Are we now focussing on keeping them out of the Ord and not worrying about the Keep?

DB – No both.

RA – Looks like they will reach the lower reaches of the Keep next wet season, if not this one.

GS - Easier to wipe out toads in the top of the catchments and the flood plains than out of the Keep River or similar, especially on the downstream side of it. The question is (can we keep them out of Keep River full stop, but ..) will we need to deal with it this next season or next? The main question for me is what can we achieve in the 2006 dry season – reclaiming any country from cane toads?

RA – A critical area that needs to be surveyed are the flood plains at the mouth of the Victoria River. If they are in there you would want to know and you would want to do something about it.

ACTION – Evaluate Banes flood plain as buffer zone.

ACTION – urgent survey of the mouth of the Victoria River.

ISSUE # 5 - Where is permanent water (incl. moist refuges) likely to remain along the front

WK - Question to RA and LS – re CT physiology and behavioural adaptation for surviving thru a dry season.

RA - Not very good at it – they must rehydrate from something. But, they don't have to have water. They only need it vaguely moist, seepages at the base of cliffs, etc. By looking around water holes you can get a good proportion of them, but if you really want to keep them out you'd have to have people on the ground following contour lines!

LS - Much less active in the dry season. They stay in their refuges - under rocks, trees, in holes. This makes it harder to remove them, as they are not moving around.

GS – Question to LS – is that because of temperature or moisture?

LS – Both, and not much food around either, so 3 factors impacting activity.

GG – Question to RA – what habitats would you find CT's in?

RA - Scarcer in tops of rock out crops where really dry, not much water or seepages; less common in really dense habitat i.e. rainforest, but they do get into those habitats and may just be harder to find in there. But fair to say less in table lands, ridge lines, outcrops etc. High and dry is hostile to CT's.

LS – We have tracked them through rainforests, open eucalypt woodland, heath, sandy and rocky creeks, urban areas, rocky dry islands – will move through any habitat, though maybe in low numbers in some of them.

WK – So you couldn't say that they wouldn't be on the top of mesas?

There are likely to be areas which are so hostile that they can't exist through the dry season, but hard to say there was any habitat that they cannot exist even if in low numbers except in REALLY dry & hostile – eg. Great Sandy Desert.

IM – We have often been badly wrong in our thinking about how CT's will colonise. When they entered the Roper River at the side of the Gulf of Carpentaria they shot up that river (backwards) in no time and hit the Stuart Hwy in central NT. They hopped upstream mainly during dry season because they had water available. Appeared at Warloch Ponds and Mataranka. Once there they were heading for the Kimberley. They went into the King River which goes into the Daly. They went backwards up the Wilson River (a tributary of the Roper) over the top of the Arnhem plateau over the rocky escarpment. No one expected this - they caught everyone off guard. So in the dry season it's backward up the rivers, and in the wet it's the other way. We need to identify where they are at the end of each wet and establish which catchments they are heading for next.

RA – They may be moved quickly by hostility of habitat, esp. when food not available. So when conditions are suitable they go across country, when not suitable they stay put, but when really bad eg water holes drying this may give them a boot to make them move between catchments.

GS – Agreed. Noticed this at Ringwood. But we are hoping that this country is more hostile as water disappears really quickly. The Roper is feed by springs and has water through the dry right up to the Stuart Hwy. The top of the Baines doesn't hold water in Sept/Oct.

KS – Don't assume all the VRD dries up, as there are tiny creeks and water holes along them, this country is supporting large number of other animals that require a lot of water to survive so there is country that probably has a lot of water there that we are not aware of.

GS – Expectation that toads will stop and refuge on water in this area, quicker than in other areas because of dryness. Want info on the differences between the Townsville-type toad population and that over here due to the hot temps and extended dry period. Do they go into refuge mode earlier and stay there longer? If it is the case, then it is something we can exploit.

LS – When we were radio tracking in Townsville the rivers did dry out. 90% stayed close to river bed and were able to find water - they dug down into ground. But 10% moved across country along creek beds, low lying lands. Moved out of tracking range, more than 3-4km. And they didn't come back!

GS – Reports from Katherine (Andrew Pickering and others) of toads being killed by weather conditions - its gets to dry, they move away form their refuge site and they die (RA and LS agree). My suspicion that parts of the Gregory Nat Park and the catchments we have been discussing, where the flow changes from east to west, would be (in Sept, Oct, Nov) some of the most inhospitable amphibian country anywhere in the NT. Does this open an opportunity for us? If we get all of the toads in a given area refuging on a permanent water hole then we have strategies that could allow us to wipe that population out, potentially.

This is achievable if the number of remaining water holes is not too high to manage. Part of the design of operations in 2006 we have to face, given that we don't know much – its an imprecise model. But if you look at the temp averages & moisture records for these areas – they are pretty rough places!

RA – One of the most important things to do then for the 2006 dry season will be to come up with a strategy for surveying very completely these places and working out how many suitable places there are where CT's are refuging. Are there lots of places spread out across the country or are there few that could be dealt with?

ACTION – In the 2006 dry season: develop strategy for surveying the area between the east and west flowing river systems to determine how many suitable places there are where CT's are refuging [or could refuge].

_____break begins_____

GG - Where are we at with sniffer-dogs?

WK – Hope to have a sniffer dog operational this dry season, June/July, need Gordon Wyre to sign off. Theoretically feasible for dog to be able to, specifically scent a cane toad only but quite a challenge for them. Need a hardy & highly trained dog to pick up scents in bush. Too many distractions in the bush for a dog trained to detect mulitiple scents.

GG – Is there an electronic version of a sniffer-dog?

_____break ends_____

DB – It is helpful for STTF to have practical suggestions from this group, as we seek funding and partnerships. Review list of some agreed management/ requests.

- Use of boats for monitoring Victoria River systems
- Helicopters
- Tape recorders for acoustic surveys – needs to be done both where you know they are and where they are not to determine the front.
- Shotgun microphones for direct on-ground surveillance
- Army – be great to be able to train them to look for CT micro habitat then they can go and search using their specialist vehicles
- Other potential allies are SES, pilots, army reserves

Southern boundaries

WK – Can we define an area of operations? How far south should we extend surveillance activity? Is there a particular rainfall isohyet or similar that we can use as a guideline, south of which there is a low probability of cane toads colonising those areas? CALM has defined an eastern boundary at the Victoria River, but what would be a good cut-off for a southern boundary?

RA – Experience in Qld suggests that it is hard to draw a line on a map to say here is where they will stop, because they move along river/water courses. And they do get into areas of low isohyet lines and quite low average annual rainfalls. If you have a propitious season for cane toad movement - once they get there they can stay there for a while. One study over 12 years of a not very wet place (from memory 320 – 400mm) where populations are going up & down quite spectacularly. Years when no toads there and years when there were (many?). They are moving back and forth in the interior of Qld. Most people think that when years are good they will get into pretty dry places.

GF – Are there any places in Qld where they have disappeared due to inhospitable environment?

RA – Knows of no area where they have disappeared altogether.

GS – Question to RA – Has that infestation around Longreach disappeared or is it still persisting?

RA – As far as I know there were still some. Moorrinya that we were just talking about is just north of that but it's along the same line.

(1.48.20)

GG – CALM likely to remain catchment driven. Teams have tried to respond to possible sighting down the Duncan and Buchanan roads, always in response to reported sightings. The eastern boundary was established as a practicality.

WK – Wanted to determine a southern boundary to help define what's currently an extensive area - in terms of resources allocated etc. Do we need to worry about southern parts of Victoria River catchment, if so how far south do we have to go?

GG – Determining the front as we go from the wet into the dry is the great determining step.

IM – Frogwatch try to establish how far south into the NT CT's penetrate at the end of each wet season. Do a vehicle run, monitor road-kill, conduct phone ring around to see where they are. CT fluctuations in response to the extreme of the dry season. Dunmarra example of toads dying out in dry years at about that zone. (Possible yardstick for evaluating surrounding areas in VRD)

RA – This is consistent with what we have been discussing. Torrens Creek example – some years heaps and some not. It does seem be GOOD to strategically to really have a go at

GS – Story related by Keith MacDondald (Qld PWS) North of Mt Isa 2 years ago a 3 year drought had wiped toads out of an area they'd been established in for 15 years. In tough country they can be killed off.

RA – Suggestion - good strategically to do the survey at end wet/early dry to really understand where the toads are and which parts of country they've made it into, what distribution is like up the small tributaries, waterholes and which rock outcrops, seepages etc they are starting to spend the dry season at. Then in the dry season itself run surveys to see where is this sort of habitat ahead of the front as well as behind it and what sites are occupied.

If you find that they are pervasive and there are hundreds of thousands of sites that we would need to eliminate them from to stop them advancing, then it may be time to announce that we may not be able to stop them. And at this point we would need to be talking about control and damage minimisation instead of exclusion. So until we understand that, it is hard to do anything else.

NOTE: Even light rain can precipitate calling from toads that are otherwise still in their refuges.

ACTION: We need to know exactly what CT distribution is at the end of the wet season. How we do this – communities, excursions, boats, tape recorders, helicopters

ACTION: Tadpole survey – distinctive, easy to spot with a little training. If tadpoles are there in high numbers then you know toads are there.

LS – In picking surveying areas a – by helicopter or whatever means and surveying for cane toad habitat. Look for rocks, refugia under logs etc, deep areas in creeks – even if dry, lower than other place, along banks for holes, eg. goanna burrows, plus areas that still have water in them. Then you know from your surveyed areas where you are likely to get toads (if they are not there yet). You can see what the scale of your problem is if you surveyed some proportion of the country.

KS – In terms of survey methodology – boats are fine for downstream but for the East Baines West Baines area it is unavoidable to use helicopters – ideal to use the tape recorder idea to pick up sounds. Leave for two weeks – pick them up. Would be very efficient.

DB – Same will be true for parts of Legune, the Keep etc.

RA & LS – Drop down in a helicopter, put down a box, do a dip net (or seine), standard habitat survey as time allows. Could possibly do 12 sites or more per day that way.

HELICOPTER Options

- 1. Just putting boxes out – as many as possible**
- 2. Also drop off people to do brief surveys**

There is a time limit factor and a trade off between cargo and people on board.

DB – Is all the helpful information that is in existence available to us? Eg. Satellite imagery

KS – Garry and I are probably the best people avail for this info. We have good Landsat imagery (but only at 30 – 60m resolution). We know from flying over the VRD there's a tremendous amount of water and pockets of water in otherwise really dry, rough country. I am not aware of any useful survey work, so to work out where it all is will take a lot of looking at maps, and a combination of guessing and local expertise, as there has never been any need to put it on paper before. It is an enormous task.

There will be limitations – we don't have the knowledge, and the time frame to get the knowledge is greater than 12 months. Need to accept local knowledge – local people traditional owners & pastoralists. Bottom line – there's a LOT of water out there. Urgency.

RA - Could do systematically with maps that identify different land unit classifications. Pick areas with different characteristics, take a detailed sample from each and apply to rest. Or use local knowledge if available, or use high-resolution aerial photography.

KS - Hi-Res aerial photography must be explored – very much better available now – down to 5cm. Single photos cover 4sq km of country.

GF – Have a look at QUICKBIRD satellite cheaper than hi res aerial. (IKONOS also mentioned)

ACTION: Build habitat map of whole region using these methods. Explore potential of very high resolution aerial or satellite imagery.

(2.10.00)

DISCUSSION OF STTF STRATEGY:

DB - Our hope and expectation is to raise substantial funds to throw everything we can at toad, to determine whether or not we can have an impact on this animal.

Once we have identified where toads are we expect to be able to deliver substantial on-ground effort to trap, hand capture, etc. toward the end of the dry season 2006, as toads start to move, when temps are right and when they can feed, breed and begin to move again. Would like to explore possibility of setting up base camps, to be able to support volunteer effort.

GS – Agreed, these are all likely to be strategies. Question now is how to expand KTB trapping and CALM activity which appears to be encouraging on a small scale, to a landscape scale? Late 2006 will tell us whether we can have a significant impact on prevention of entry into WA. If they do get through what we will have learned is exactly what we need know to do good harm minimisation. Need a practical view of the landscape scale of this and how many people we will need to do it.

ISSUE # 9 - Strategies for life stages of toads

GS - Question to RA and LS - is it worth 'nuking' metamorphs and tadpoles? Or should we just mop up adults?

RA and LS – It could be possibly useful to wipe out metamorphs because they are restricted for at least the first few weeks to the shore line of water bodies and they are diurnal so they are easy to find. I can image it possible to devise a trap because if you provide a retreat site they will move in there. The problem with metamorphs and even more so with tadpoles is that you need to get rid of 99.9% of them otherwise you're not accomplishing much. With metamorphs it may be possible, with tadpoles very hard. With tadpoles there is evidence of density dependence, if remove half then survivors grow better and you may get more metamorphs.

GS – Question - has anyone used Chemical sprays to wipe out metamorphs?

RA – I've heard of the effectiveness of Dettol – problem being that chemicals may kill everything.

GS - Has happened in NT. Malathion used to wipe out metamorphs in a dam. Probably done at a time when there was not much else living in that zone. Water just beginning to flow

into the dams 10,000's of metamorphs. 50mls in a 10lt backpack and killed all! Obviously residual impacts need to be looked at.

RA – Unintended kill could be severe. But unlikely to impact other amphibians - CT's are unique in their biology so could be fairly specific with right timing.

ACTION: Evaluate potential for use of chemical sprays on metamorphs

DB – Please elaborate on metamorph trap.

RA – During the day, metamorphs will shelter in the shadows (rims of footprints etc) so if you provided a moist dark area then large numbers would probably go there and could perhaps be collected.

ACTION: Design experimentation for metamorph traps

ISSUE # 8 – Constructed barriers – what is their likely value?

DB – Lets evaluate barriers: acting as funnels, eg drift nets, temporary or otherwise, from a local to a regional scale.

KS – Likely that drift net fences will work effectively at moving/funnelling them along to collection areas. Recent NT reptile surveys using drift nets and pitfall traps caught very large numbers of toads. They were using 100-200m lengths (30 cm tall) fences – and large numbers collected.

GS – Interesting that while cane toads can climb they will prefer to go around or along things.

RA – True of behaviour that they do that. So long as holes not so big they go through. A drift fence to drive toward traps should be really effective but not as an exclusion barrier – they are remarkably good at finding ways out of/and over things if they want to. Note that there is a big distinction between 100% exclusion and reduction or funnelling with cane toads. (examples given of trying to pen CT's).

KS – Usefulness of solid barriers should be looked at but it is during the wet that CT's are moving and very difficult to design a barrier that will work in the wet.

RA – Useful in two ways 1) in increasing the efficiency of traps 2) if we go into damage minimisation mode. Eg. Pick areas of sensitive habitat and work like crazy at excluding toads from those toads out including use of fences.

But on a regional scale, to keep toads out of WA or to keep them from crossing the flood plain when they get to the mouth of the Victoria River ... seems impractical to me. Could not be the only measure. Maybe if you set up a fence then had a trapping programme, patrolled regularly plus a trapping programme behind to catch any that get through but its always going to leak and it only takes a very small leak and suddenly you've got a million toads (because of 30,000 eggs at a go) and they do very well in new areas.

GM – Need to remember we are not here just for CT's. There are other species out there – need to look at bigger picture of animal movements through the landscape.

GS – Preference for knitted shade cloth because a lot of smaller animals (reptiles eg) will be able to climb that where they couldn't climb plastic. Also sections of wire mesh that would allow small animals through. Question becomes what is the range of movement of toads before they hit 30mm in length and how far do they move from their breeding location?

RA – Not very far 25 – 30 cm is when they disperse, 20-25 is the metamorph life history stage and they don't disperse a lot. Re mesh size, (frogs) are flexible, 25mm CT can get through a quarter inch mesh. Also: Plastic fences + Fire = No fence.

KS – Suggestion: looking at barriers that had specifically designed leaks in them – allowing native animal movement etc, so we 'know' where they are coming through, then look at what you would need to implement at those points.

GS – Agreed. One of the things we want to talk to GF about was to turn the Auvergne boundary fence along Gregory Rd into a CT proof fence. Looking at mechanisms (fish ladders eg.) to allow some animals access through – looking mainly at mesh size - i.e. skinks but would shut toads out. How close to a breeding point would we need to worry about the size?

Knitted shade-cloth lasts pretty well, is not expensive and allows water to pass through it to a degree. We need to get a sample/test site to assess whether it would be feasible. Needs to be along an existing fence, using the road, high, dry ground.

GG – CALM has always had fencing in the mix – will seek answers to best fencing methods for protecting areas in WA if cane toads cross the WA border. Have been looking for special habitats for this to occur like Kiln Kiln – but this has Indigenous interests, and they want the area left alone. Is there a site where we can trial this behind the front line?

GF – Probably be wanting to look for areas where there are currently no toads but is directly in the line of advance, so testing can be done quickly. Somewhere around Auvergne, somewhere along East Baines once it stops flowing. In many of these areas (eg Kiln Kiln was 5m underwater this year) in the wet season impact the fence would have been under water - not ideal.

GS – Question to RA – What is your best guess re height on fences?

RA - Want it to be at least 70 - 80cm (if you really wanted to keep toads out) I've seen them jump 30 – 40cm (cattle watering tanks). Been thinking during this discussion – it might be worth considering a system like they have in a clean room in a hospital. They have graduated exclusion bacteria filters. A staged series 95% of 95% of 95% leaves you with so few that it's not a problem. A single CT proof fence is always going to leak (potential for damage etc) so your investment becomes worthless. So not thinking total exclusion, but a series of filters. Don't know if it could work on regional scale – maybe. Nobody's tried it before.

DB – Experimentation with barriers would always start small. Whether exclusion fencing to keep toads out, or to funnel, or to join natural barriers to stop CT's, there is always going to be issues with the movements of other animals. We are aware of AWC and similar groups that have experience of fencing refuges and may deal with similar problems. We may be able to learn from other organisations and build some experimentation into models that could be trialled in the NT if NT P&W were supportive and perhaps applied in WA later if needed.

GF – Identify what we hope to achieve from the trials, then work from proposal to find sites to suit the trials, rather than other way around. GS should talk to KS and GF.

KS – Agrees. Determine the fencing plan first rather than the sites.

RA – In early design stages - more efficient to build a trial fence and then see if CT's can get out!

ACTION: STTF to come up with discussion paper on fencing trials.

DB – Time is running out – call for comments on issues not discussed. Any last minute comments on:

Issue # 12 - How can we best evaluate the effectiveness of on-ground control measures

Issue # 11 - Consolidating and centralising information

GG – Depends on objectives. If the objective was to keep CT's east of the Victoria River we can say that the on-ground program to date has not been very effective. In future we may get a measure of progress from an annual 'picture'.

DB – The STTF's objectives remain as trying to keep CT's out of WA and should we fail in that to try to take the sting out of the front and protect WA's flora and fauna as much as possible.

GS – Measuring CT relative densities from trap catches on both sides of fences (may not be rigorous science but ..) may help to build the picture of what is happening with CT densities across this country. The more sites you get information from the better. Could even be useful get some data on densities east of Victoria River to compare with areas where we have had toadbusting.

My big hope is that we will be able to do much more in 2006 dry season than we have achieved to date and we need to ensure that we keep one eye on monitoring process so we can evaluate this. Rigorous evaluation relies upon population data, which is next to impossible - variation is a big problem, 46 toads one night, 290 the next.

IM – If you want to get a handle on the toad front at this difficult time of year, when accessibility is really bad, I'd suggest do a phone survey in region (every land owner/property manager, pastoralists, police, etc) of where we think toads will be – locals will have a pretty good idea of where the frontline region is – very worthwhile esp. for the wet season.

GS – Question to RA – When will you be able to report on audio attractants?

RA – We are hoping by the end of March.

GS – We will feed through the results to you of the 'toad-hummers' CALM and we have been using. Are you using male mating call or are you using the breeding frenzy 'clucking' noise for "get off me"? Recently observed at Ringwood that when that is happening toads come from all over the billabong. Do you think its worth trialling that call as well as the mating call?

RA – Could be! We haven't tried that but it could be worth trying. Especially for the shorter scale.

GS – What we have seen is that it might have an effect on the wetland scale in bringing toads to it. We might try interspersing the two calls. We will feedback results to you.

GM - Question to RA. Recording devices - can you send description of devices?

RA – Yes. Potential for solid state now – we used old clunky tape recorders, electronics people changed tape battery use to lower voltage use. Electronics people changes the relays in Arlec timers to run on 6v instead of 240v.

WHERE TO FROM HERE?

DB - THE STTF intends to use the information from today in two ways:

- 1) we will write up a general report on today's proceedings and circulate
- 2) we will use the outputs of today to underpin the STTF on-ground strategy and operational plans – these too will be circulated to participants (they will also be broadly circulated for input, engagement and sign on)

Obviously for STTF there is the potential that outcomes may also assist by way of supporting rationales for funding, sponsorship, partnerships, concessions, etc.

Today's participants are encouraged to continue to input & to engage in our strategising. 2006 is the year of hard effort. We will throw everything we can at the CT this year then, depending upon levels of success, it will be up to everyone to decide whether it is worth continuing the fight in the years ahead.

Sub-committees may be set up to develop detail in these strategies and it may make sense for this group to meet up again, say in 6 months, by way of progress reporting.

EVALUATION

An evaluation was conducted on the day's proceedings. One of the most salient observations made was the high level of agreement/concord from participants.

Thanks and close.