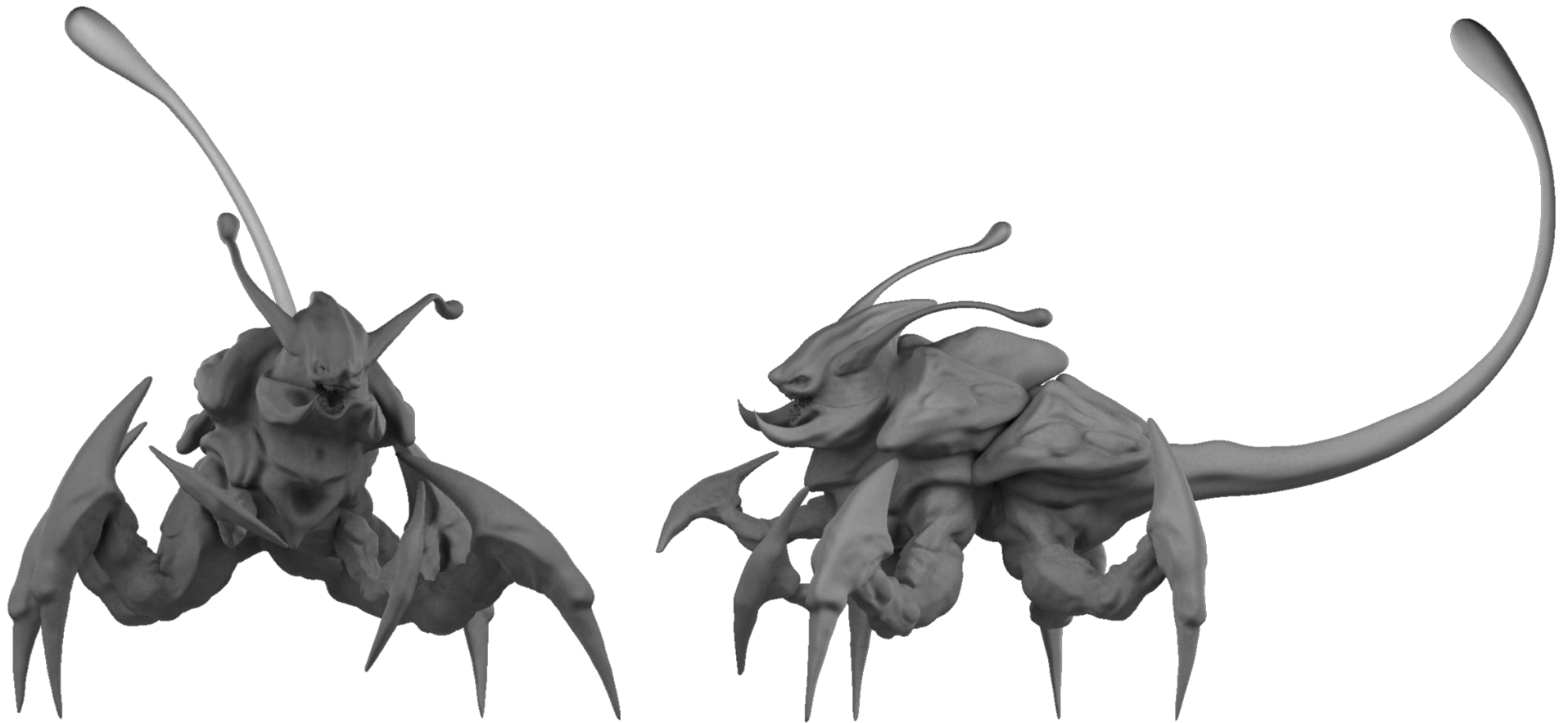


# Fantasy Creature Animation

## The Thresher



## **Fantasy Creature Animation**

This project looks at fantasy creature animation in the wider context of the film industry. It outlines the process of how a company might go about building a creature document which defines the physical movement and demeanour of a creature. This document would then be used in industry to ensure the continuity of movement of a creature when it is being worked on by multiple animators. The report then looks at how an animator would use the document and the pros and cons of using such a process.

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# The Creature

A fantasy creature has no real world equivalent and therefore its movement and behaviour cannot be referenced from a single real life animal. This report will look into the process of defining and animating a fantasy creature. By studying and researching the anatomy and movement of a variety of real world animals, we can consider what would work best with the creature. Also by looking into how animals move and behave in certain situations, decisions can be made on how the creature should move, and it can be animated realistically with believable weight and emotion.

The report will look at this project in the context of industry, how a company might put together a creature document and how a professional animator would approach a scene using the document. This document is important given that one animator may not be only one animating the creature, and continuity of movement throughout a project is very important.

The aims for this project are to gain a better understanding of creature animation as a whole by going through the process involved in bringing a character/creature to life. The research and creature document will form the basis of an animation (max 6 seconds). This will show the creature moving in a believable way and also show its demeanour and hopefully provoke the desired emotions in an audience. The intended outcome is that at the end of this project, animators such as myself appreciate the process of research and reference required to understand and animate a fantasy creature believably.

The innovativeness of this project lies in the fact that there is little to no documentation of this process, or how one approaches a creature animation task. This report will be an example for a director or animator of how to approach the research and definition of movement involved in fantasy creature animation.

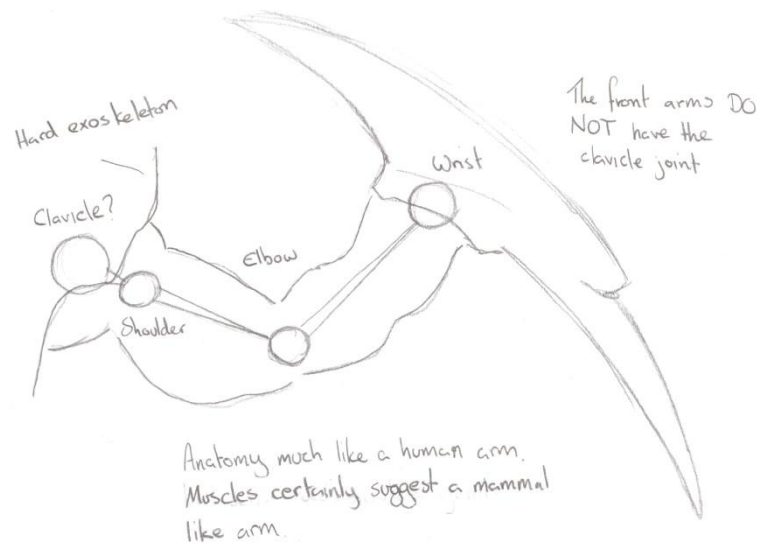
# The Physical Thresher

As stated this project will look at things in an industry context. With this in mind I emailed MPC (one of the leading London based VFX house who deal with a lot of creature animation) and got a few questions answered by one of their animators. **(Appendix A)**. The answers to these questions will form the basis of the report. I will draw up a creature document that would inform any animators working with the creature how it should move and the emotions it should provoke within an audience, and then use this document to base an animation on.

Based on the answers from MPC the very first part of the creature document will have a brief background of the character and details about its size and mass etc. These facts will form the basis of any further research and allow a more focused search for reference. As the 'director' for this project I will be responsible for the details; however I am aware that in an industry context this would not be my role, also the model and rig for the creature have not been done by me, I am only defining and animating the creature.

**(See Appendix B)**

Now the Thresher is defined in a broad sense, research can begin into how it should move. The first step before diving into the very large world of insects and arachnids will be to do some preliminary sketches of the Thresher. These will help when researching as it will give a better understanding of the anatomy. Particular attention will be paid to the legs, as this is where most of the influence for its movement will come from.



## The Legs

These two sketches look in more detail at the legs of the Thresher. On further inspection it was surprising to find that the legs are very much like human arms as opposed to insect legs. This prompted some additional research into insects to see if they have similar legs. Below are the examples found of different types of insect legs:

Characteristic	Appearance	Example(s)
Cursorial -- adapted for running		Ground beetles and Cockroaches
Raptorial -- adapted for catching and holding prey		Praying mantids
Natatorial -- adapted for swimming		Diving bugs and Water beetles
Fossorial -- adapted for digging in soil		Mole crickets
Saltatorial -- adapted for jumping		Grasshoppers

(Meyer, 2005)

The only similar insect leg with the down-up-down zed shape is 'Raptorial'. The problem is that this is found only on a praying mantis and only on their arms. This suits perfectly the two arms that the Thresher has, but not the legs.

This finding was unexpected so the first step was to try and define the Thresher in the insect world to see if this would allow more specific research than just 'insects'. After trying several sources to define the Thresher it seems there is no insect category into which it would fall. This is due to the fact the Thresher has no wings, has a long tail and does not have a complete exoskeleton.

It was concluded that the search needs to be broadened outside of the insect world to find some suitable reference. A movement similar to dogs and cats was considered on the purely superficial ground that the Thresher is also a quadruped. However this was quickly deemed unviable because their legs are very different to the Threshers. Also it is important to stay away from these movements as it might give the wrong impression of the creature to audiences who recognise the movement as that of a pet. Reptiles were then chosen as a suitable starting point because like the Thresher their legs come out beside them, whereas most other quadrupeds have their legs directly beneath them.

After some time researching the leg movement and step pattern of many lizards, particularly small, fast moving ones, a style of movement was found that will work well with the Thresher. This will work better because reptiles as well as the Thresher are quadrupeds with their legs beside them not underneath them, and they also have the fast movement the Thresher should have.

Without any real world animal reference for the shape of the legs it was decided to find some CG inspiration to splice together with the lizard movement. A perfect example was found in 'Attack of the Clones'. The creature is called the Acklay (pictured right) and it has very similar legs to the Thresher.



(Star Wars: Episode II - Attack of the Clones, 2002)

It is noted that the Thresher is not entirely lizard like because the lizard's legs are connected on the top of the torso, whereas the Thresher's legs are connected at the bottom of the torso. It is also not completely like the Acklay because the Acklay is higher off the ground and has six legs. However a combination of the movements of the bearded lizard (below), and some of the Acklay's could provide very interesting and compelling locomotion because the quadruped gate and step pattern will come from the lizard, and how the individual claw like legs operate will come from the Acklay.



(ps3pspndsman, 2009)

Now we have several videos to use for reference and include in the creature document it's necessary to look into the other main parts of the Thresher, namely the head and tail.

### The Head

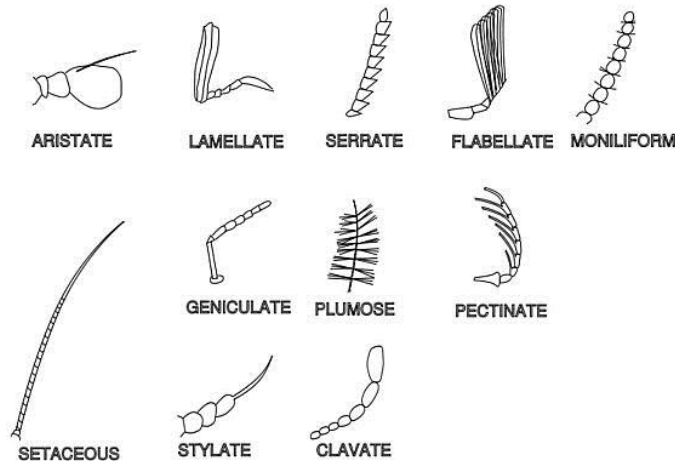
The head of the Thresher is the least insect like part of the creature. Insects have large eyes compared to their bodies and don't have a jaw like the Thresher. Although the Thresher does have mandible like tusks, these are more a display or weapon rather than a practical aid to eating. This is consistent with reptiles and led my research again into the area of reptiles. Below is a preliminary sketch of the head area.



Reptiles will be a good choice because they are great hunters. They can lie perfectly still, and then suddenly move into action, similar to spiders and insects. This is exactly the kind of hunting/stealthy style the Thresher should have.



The final part of the head is the antennae. This is something definitely more insect like. Similarly to the legs the first step was to define the type of antennae.

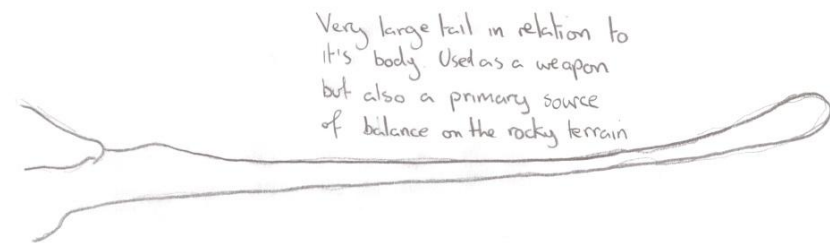


(Shyamal, 2006)

Above are different types of antennae and as we can see the Thresher clearly has 'clavate' antennae. It is the 'director's' choice what the Thresher would need antennae for, so in this case the Thresher's antennae will be for smelling and sensing vibrations of prey whilst hunting. Insect's antennae are very small and delicate. They do not make good reference for the Thresher's more robust antennae; therefore it was decided to think of the antennae as tail like for the Thresher.

## The Tail

This is the final important part of the Thresher that needs research. In the sketch below it has been noted that in the insect/arachnid world the tail is similar to that of a scorpion, however it's also noted that the Thresher tail can move in more directions than that of a scorpion. Due to this it can be ruled out as a viable reference for the Thresher.



Tail very much like a scorpion's tail. Could use it in a similar way however Threshers can move their tails in all directions.

Earlier in the report it was noted that the movement of the Thresher should steer clear of anything that the audience might recognise as a friendly pet, however after looking at the Thresher's very long tail it was decided in this instance referencing a big cat will be necessary, particularly for when the Thresher is balancing. Another good reference is an Ankylosaurus (below), it's good reference for how a creature uses its tail as a weapon.



(Liebman, n.d.)

### The Arms

The Thresher's arms are used mostly for killing prey; however it also uses them for extra balance when needed. The arms are much like a praying mantis'. A praying mantis uses its arms as a grabbing tool, whereas the Thresher will use its arms for both stabbing and grabbing. For this there isn't any real insect reference, although there is some CG insect reference. The arachnid warriors from 'Starship Troopers' (Starship Troopers, 1997) have sharp bladed arms used for attacking enemies. They have a very quick sharp stabbing motion which will be used as reference in any attacking situation.



Arachnid Warrior. Arms coiled above head ready to strike. (Anon., 2010)

Now a clearer idea has been set about how the creature should move it is time to put together the next part of the creature document.

**See Appendix C**

Obviously the document doesn't cover everything. If this document was for an actual film it would clearly need to cover all actions the Thresher would have to perform in the film. But as this is an example of a document, it just covers the basics. The next section moves onto identifying the demeanour of the creature and how it makes people feel.

# The Mental Thresher

In this section we will look into the demeanour and behaviour of the Thresher. The Thresher looks intimidating and it will be very aggressive, it should instil a sense of fear in the audience. As the Thresher looks like an insect on a superficial level it is important to investigate why we fear insects, then with this information look into aggressive postures the Thresher might adopt.

## Entomophobia

As the Thresher is an insect like being I have researched the fear of insects:

*“Entomophobia: An abnormal and persistent fear of insects. Sufferers experience anxiety even though they realize that most insects pose no threat.” (Anon., 2002)*

This is good, we know what the technical name for the fear is, but *why* exactly do we fear them? For me personally it's the alien nature of them, you can't read them or figure out what they will do next. For example with a dog, we humans can recognise our emotions in them, we empathise with them. Also they have readable faces, we can tell just by looking at a dog what it is feeling, and then act accordingly. However this is not the case with an insect, not just because they are small, but they don't have recognisable smiles, or frowns etc. We don't understand them

and we can't empathise with them, but most importantly, we cannot tell what they will do next.

*“Part of the reason why bugs are so gross to people is because we do not understand them. While people may be fascinated by documentaries on lions and tigers, animals that would not hesitate to kill you in the wild, we are disgusted by bug stories. These little creatures lack similarities to our domesticated pets and there is nothing cuddly about them. In many cases, this unfamiliarity and misunderstanding leads to fear. Bugs look strange and bizarre, they often have six, eight, or what seems like millions of legs, they may not have eyes we can see, and they cannot communicate with us in a way we are used to. This makes a lot of people uncomfortable and when something feels strange, it can lead to fear.” (Wright, 2004)*

Having spent some time reading bug horror stories from people around the world, the above paragraph perfectly sums up the findings. People don't like the things we don't understand (although there is an argument that people would still be put off by bugs if they knew everything about them). This also reinforces my point made earlier about not having the Thresher move in a way that would be recognisable to the audience. The less the audience understand about the Thresher, the scarier it will be.

One of the main reasons we fear bugs is that we don't know what they will do next, and when they do something it is very quick and can be in any direction. With this in mind it is important to make the Thresher agile. A very good thing to reference for this would be the Alien from the Alien series of films. It's a natural killer, fast moving, and can hide anywhere before striking with deadly precision.

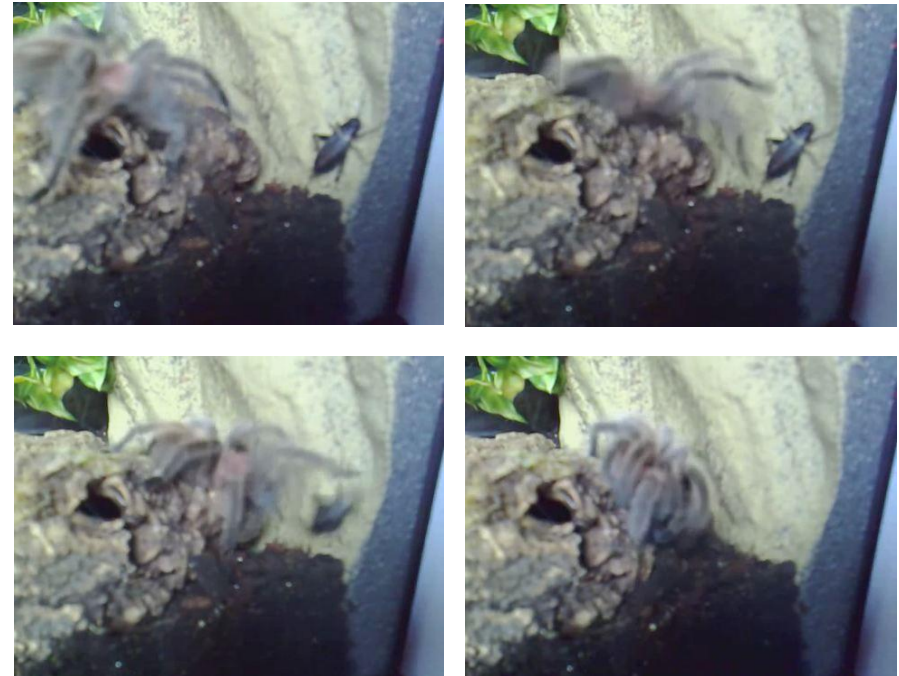
This is where this information becomes useful to an animator and allows them to really enhance their performances. The idea that we fear something because of its speed and unpredictability, the fact we don't understand it, we're unsure about its motives. All of this is something the animator can incorporate into his or her work to achieve the director's vision of the creature.

In regards to posturing, the Thresher would act very much like a spider. When threatened it would try to run, but if cornered it will try to make itself bigger by lifting its arms ready to strike (below). When attacking, like a Tarantula, it would crawl slowly towards the prey before striking very quickly.



(OceanwideImages.com, n.d.)

This video is a lot clearer than these stills suggest, but this is exactly how the Thresher would pounce. A tarantula attacking its prey:



(mattcrash1985, 2008)

Now we have a decent idea of how the Thresher will act we can investigate the animation process.

**See Appendix D**

# The Animation Plan

With the document is drawn up I can put myself in the shoes of an animator. Regardless of the scenario, the aim is to get across the character of the creature. One of the main concerns is that in movies the sense of fear comes largely from realism in all areas (textures, lighting etc.), not just animation. With this in mind the main criteria I will judge my animation on will be the believability and realism of the animation, and secondly I am going to aim to give the Thresher presence on screen, because to provoke fear in the audience would be asking too much without all areas of realism.

Here is a short list of scenarios for possible animations, but no matter what is picked the animation will be no longer than 6 seconds maximum.

Potential Scenarios:

- Attacking/Pouncing on prey
- Aggressive display of dominance
- Moving swiftly across rocky terrain
- Standing still and creating a presence
- Two Threshers fighting

The scenario that will be animated is the attack shot as it is the most interesting. The situation involves the Thresher sneaking slightly forward to the top of a rock before pouncing down onto its prey.

# The Animation

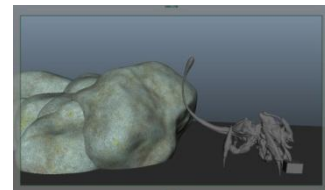
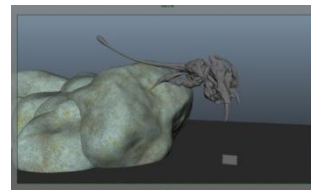
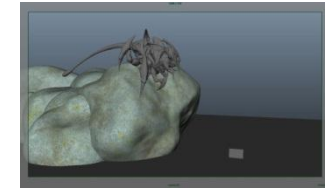
The process is fully into the animation stage and I have started off with blocking. This stage will be where an animator picks up on any issues or lack of details in the creature document that they might need the director to clarify. It is imperative these issues are ironed out quickly as not to delay a production.

I am happy with the timing and ideas of my rough first pass, in particular I am pleased with how the legs are moving and how the pounce is working. I had to rework the pounce because it looked too cat like. To solve this I looked at some more spider/insect reference and gave the jump more height, having the Thresher come down more vertically on its prey. I have kept to the lizard step pattern which is mentioned in the document, but to give the movement a bit more unpredictability I have offset the timing of the legs slightly, for this I used the Acklay reference.

As stated previously this is the time that issues are picked up. I have found there is one area in particular which isn't working so well and needs researching further. The area is the tail; the document says it is used for balance similar to a cat. This is fine, but an animator would have to look up their own cat reference.

Animators do have some artistic license when it comes to what the creature might do in a shot. I thought it would add interest to the shot to have the Thresher slip slightly on the rocks as it moves across them. It currently works well in the blocking, but needs refinement, which means doing some research into this.

Another concern as an animator is that the creature has no real readable silhouette; however this would not be the fault of the animator, they would just have to deal with what they have. The lack of a silhouette might work, because not being able to read the creature may unsettle the audience. Below are a few key poses from my first blocking pass.



## The Tail Pt. 2

The document mentions the tail should be cat like when balancing. This is what an animator would need reference for.



(BBCWorldwide, 2008)

This is looking at a snow leopard because it has a very large tail. Here we can see that indeed the tail is down as it is hunting. But now we have a much clearer idea of the shape of the tail. The tail is often curled up slightly at the end. It's the details like this that help add nuance to a shot.

## The Slip

The slip is an action which would have to be approved in dailies before an animator could go ahead with it. But if it was passed then it would require research by the animator.

No appropriate insect reference was found for the slip because Insects tend to have very good grip, so research was directed towards big cats again as the Thresher's balance is already referenced in the document as cat like. No like for like references were found. That is to say any footage where a cat slipped whilst hunting, but it's definitely good to have some solid reference of cat slipping as a base to work off of and improve what is in the blocking. Below are some pictures showing the cat slipping references.



(BigCatRescue, 2011)

Once the actions were set in the blocking stage the animation moved into the spline and polish stage in which the refining of all the movement happens.



The primary concern of my investigation has been to see how a director would research and build up a creature document for animators, and then how animators would deal with this information. Through exploring the intricate relationship between both sides of the creature animation process it is clear what the pros and cons of the practice are.

Firstly let's look at the animation that was produced as a result of the process. The aims were to use the document as a guide to base the movement of the creature on. The animation has been successful in terms of weight and movement of the creature, and it is clear where the creature document has had an influence of the animation. The lizard step pattern has been adopted as the creature moves across the rock. Then there is the influence of the spider attack reference as the steps get slower, wider and more irregular ready for the pounce. After the pounce it is obvious that the stab of the prey comes from the Starship Troopers arachnid reference. Although the tail shows elements from the snow leopard in the way it curls up at the end, the movement is a little unsure and not quite completely convincing.

This brings up one of current limitations of the creature animation process. My investigation shows that in order to get the most out of a creature document it will necessary for the document to be very detailed, more so than this report had time to go into. Things like the tail which is

very long and like nothing in nature, and the antennae need to be detailed and researched at an anatomical level before searching for reference. In fact a creature like the Thresher, which is a mix of many different things and is hard to define in any area, could do with a full anatomical study from someone who is an expert. Although this report does its best to study the creature, including some preliminary sketches, they are not anatomical studies, and do not go into the amount of detail which would be required for a more thorough creature document.

Although the lack of a full anatomical study was a disadvantage, it doesn't render this report redundant. Within the constraints of a limited study it has been possible to clearly demonstrate the value of a creature document. Many animators might see the Thresher and dive in to animate it like an insect; however it was clear from research that anatomically the Thresher is very little like and insect. It is this stage in which the value of the document is obvious. In industry you want continuity of movement, and you don't want animators drawing their own conclusions about basic movements. This issue came up in this report, the animator was unsure about something undefined and under researched in the document (the tail). This just shows that the level of detail needs to be higher in future creature documents.

In summary a creature document is a very valuable piece of documentation during the animation process in industry. It allows an

animator to not have to worry about the details of certain movements, but still have the freedom of acting choices for their animations. The work in this report suggests that further consideration into the detail and depth of the creature document could have significant benefits in regards to saving time and allow animators to work more efficiently. Even if you're an animator working on a solo project, is it always important to have everything defined based upon research.

## Appendix 1:

**Q:** What's your process when presented with the task of animating a fictional creature?

**A:** The first step is to have a proper brief. You need to have a pretty good idea of what type of creature this is if you want to animate it convincingly. Some typical questions you may need to ask are: Is it completely realistic, based in an animal or has it some fantasy/idealisation/humanisation percentage? What is its role in the movie/sequence? what is its size and mass? the more you know about your creature the better you'll be able to imprint life on it.

If you don't work for a director/anim supervisor or client, then the brief needs to come from yourself!

The second step is to gather documentation. Animals, humans, actors, etc... the more the better. Videos, anatomy, pictures with good poses, visits to the zoo, etc... The third step is analysis. Analyse the documentation, watch it several times, and also frame by frame. Focus in specific areas that are more challenging. This is about learning the body dynamics and about what is driving the performance.

Here at MPC we also film ourselves performing the action that we are going to animate, and then we analyse the resultant clip. This is an invaluable analysis tool as well.

Finally you go and animate. If you have documented yourself properly you should know by now what the creature should be doing, more or less.

**Q:** How much of the decision about how the creature will move/act is up to you, and how much is dictated by a character document or something similar?

**A:** I always feel that when I animate a creature it is the result of many elements. Some of the anim comes dictated by the documentation, some of it by yourself. Anyway I think it is a good idea to start the work based in documentation. A place like MPC is based in realism, so we relate to real-life all the time.

**Q:** Do you ever look into the emotional states (e.g. frightened, aggressive etc.) of animals as well as the physical movements?

**A:** Yes, all is part of the documenting process. Learning how to find pertinent documentation and what to use of it is a skill that needs to be learned and developed.

**Q:** What would you say is the most important thing to concentrate on when animating a fictional creature?

**A:** It is important to never lose the big picture. What is this creature? How does it behave? What does it want, etc... basically have the brief always in mind. Don't get lost in the details. The details come at the end, and they are indeed important for realism and richness, but a good base is the foundation for a successful shot.

**Q:** And finally any expert tips you could share with me?

**A:** When it comes to execution (that is, animation itself) focus just where the movement is coming from. Concentrate in the pelvis and torso and the line that goes through the spine all the way to the head (depending of the creature, of course). The mass, weight and overall mood depend on those body areas. If you can achieve a convincing performance focusing in those areas, the shot will be yours.

## Appendix 2:

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**Name:** Thresher

**Height:** 1 metre

**Weight:** 1 metric ton

**Diet:** Carnivore, smaller creatures.

**Natural Habitat:** The Thresher is an insect like creature with an astonishing ability to survive almost all environments except exceptionally cold regions. Usually Threshers will be found in rocky outskirts of jungles. They rarely venture into the jungles because their pointy claw like legs do not deal well with soft ground.

**Character:** The Thresher is a territorial and aggressive creature. They live in small groups, however sometimes two males will engage in a very violent fight between the two. When fighting other Threshers their primary weapon is their large club like tail, but when hunting more damage is dealt with their smaller front arms which can stab prey.

They will eat almost any animal smaller than them without hesitation. They're surprisingly agile for their size and can move silently across the rocky terrain they occupy to avoid detection by their prey.

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## Appendix 3:

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### Thresher Body Mechanics

**Reference: Bearded Lizard, Acklay.**

#### Walking & Running

When moving, the Thresher's step pattern is similar to that of lizards. Two legs are moved at a time, front left and back right and vice versa. However the steps are not as low as the lizards, the legs are lifted more off of the ground higher like the Acklay. This is often less obvious when hunting, a more irregular step pattern is used when the creature is travelling slowly across uneven ground.

When walking the head is up and alert, as are the antennae, searching for prey. If the terrain is particularly rocky, the Thresher may use its front two arms as extra legs for balance and grip. The tail is used for balance when walking in a fairly idle but slightly curled position. The Thresher has the agility and balance of a cat, particularly noticeable in the use of its tail.

If running the Thresher's body and head are lower down making it more streamlined with a lower centre of gravity. The antennae are back and the tail moves side to side to counteract the body. The front arms are tucked in; however it can use them for support over any heavy terrain.

#### Stalking/Hunting

The Thresher is highly alert and aware of its surroundings when hunting. It often adopts a higher body position to spot its prey, however if stalking the body is very low. The head is up and the antennae are active sensing the prey. The tail is down and used for balance like a cat. It also uses its front arms to distribute weight more evenly and reduce the noise of its footsteps.

#### Attacking

If the Thresher is engaged with another of its kind it will use its tail in a display of aggression, whipping it around and thudding it onto surrounding objects to assert dominance. If neither Thresher backs down then a fight will break out, both Threshers will use their tails to hit each other, although their front arms would do more damage, they do not wish to kill each other, just merely prove that they are stronger than their opponent. The fight is over when one of the Threshers conceded defeat and retreats.

When attacking prey the Thresher pounces quickly, stabbing prey with its arms, or even occasionally its legs if pouncing from above. On the rare occasion that the Thresher misses its prey, it can knock out most animals with a swipe of its ferocious tail. However the accuracy of this isn't very good on small targets.

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## Appendix 4:

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### Thresher Attitude

#### Reference: Alien, Aggressive Spiders.

The Thresher is very aggressive and will attack without hesitation if cornered. It is very stealthy and will do its best to not attract attention to itself.

The Thresher is not just a natural born killer, it is very smart as well, making it a lethal predator. Very much like the Alien in the Aliens series of films the Thresher will only attack if the odds are in its favour. Threshers do work together against a more dangerous enemy, or a larger prey animal.

Threshers spend a large part of the day sunning themselves, although this means being completely exposed to their predators, they camouflage very well into their surroundings. The rest of the day is often spent hunting.

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