Jungle warfare

According to the Armed Forces theory of fundamental capabilities
Special thanks to:

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You have made me feel welcome in France and at Saint-Cyr Coëtquidan, and have been most helpful with my installation and presence at the school. Thank you for working so hard for me so that I could go with the French cadets to French Guiana and do the jungle training course.

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Ghislain Drécourt and 1. Platoon at 6. Company, 2. Battalion at Saint-Cyr Coëtquidan
You have welcomed me into your platoon and made me a part of it. You have helped me with everything that I could ask for regarding social life. For you this may have been a small matter, but your efforts means a lot to me. I hope to be able to work with you in the future.
Summary in French/Résumé en français:

Aujourd'hui, les conflits s'enflamment vite et peuvent devenir importants dans un court laps de temps. La tendance des armées occidentales est d'avoir une capacité de déploiement rapide et d'être en mesure de mener des opérations militaires quelque soit le type d’environnement afin de stopper un conflit s’initialisant. La capacité de se battre dans la jungle est donc plus actuelle que jamais.

Mon travail est une analyse de données qualitatives du combat en jungle dans laquelle j’utilise les principes fondamentaux des forces armées suédoises¹ afin de décomposer le sujet et d’obtenir un meilleur aperçu de la guerre dans la jungle. J’utilise également comme méthode l’observation participante en vue d’obtenir une meilleure compréhension de cette dernière. Mon travail est surtout basé sur le plan tactique afin de voir comment une section agit dans ce milieu.

J’ai abouti à quatre conclusions:

✓ Pour être en mesure de mener une guerre dans la jungle, vous devez être formé, acclimaté et préparé. Si vous ne l’êtes pas, votre pire ennemi sera la jungle elle-même.

✓ Dans la jungle, la façon de faire guerre revient aux chefs de groupe et aux soldats plus que quiconque, en raison des courtes distances et des difficultés à poser un appui-feu.

✓ Gagner les cœurs et les esprits² des indigènes est la clé de la mobilité afin de recueillir des renseignements ainsi qu’une certaine autonomie.

✓ Il est important d'avoir la suprématie aérienne et d’être en mesure d’utiliser les rivières, en raison de l'avantage gagné par l'utilisation des hélicoptères et des bateaux. En outre, l’ennemi aura un gros désavantage s’il ne peut pas les utiliser.

¹ Försvarsmakten, Doktrin för gemensamma operationer, Stockholm: Högkvarteret, 2005., p. 61
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1. Introduction

“... the essence of jungle war is when, at any intensity, certainly tactics and training, probably weapons and logistical support, have to be modified because of trees.”

– J.P. Cross

1.1 Purpose and background

In the Swedish military academy, the last thing the cadets do before the officer exam is to write a thesis. Each year a few cadets have the opportunity to go abroad as exchange students to another military academy and write their work - I took the opportunity to do this because I wanted to go to France and expertise the military, the culture, the people and to improve in the language.

When I first began doing my research, I wanted to combine studies on the jungle and armor, the former, because jungle combats have always interested me, and the latter because in the future I will work with battle tanks. I started to look for books that explained the use of tanks in the jungle, and found books about tank battles, mostly in the Vietnam War. However, I chose to only work with pure jungle combat in the Amazon rain-forest where armor may not go due to the nature of the terrain, only infantry. The reason why I chose infantry combat in jungle forest is because I can use the French expertise on the subject, an expertise that Sweden does not have.

To seize control over a terrain, boots on the ground is a necessity, regardless if the environment is a cold and snowy mountain with steep slopes or a hot and humid jungle full of sharp leaves.

It is more vital to be able to conduct jungle operations in some countries than in others. France for example must have a jungle capability in their armed forces because some parts of their country are located in a tropical zone, an area where there is jungle, and a sovereign nation’s integrity must be maintained. They also conduct international military operations in tropical countries, for example Mali (where the southern part is tropical), an operation that is indeed very much at the center of

attention in today’s news. They also have bilateral military agreements with countries such as Gabon whose territory consists essentially of rainforest jungle.

Sweden on the other hand, does not have a jungle within its nation’s territory, and have had a few military operations in a tropical climate, in the jungle. Swedish troops under UN MIL command in Liberia 2003 -2006⁴ is the most recent one, and in the future there will probably be more operations in the jungle due to the conflicts close to the equator, in the central parts of Africa, for example in Congo and the Central African Republic.⁵

The European Union has a Military Battle Group⁶ that is one of the EU’s instruments for the crisis management capability. This battle group is a quick reaction force that has the capability to fight in any environment. Sweden as member of EU, and also a part of the battle group, has to take part in a possible EU operation. It means that although Sweden does not have jungles, they must have the capability, training and knowledge in order to conduct jungle warfare.

Personally, I find jungle warfare very interesting, with all the limitations and therefore challenges that it offers. I have learned a lot through the undertaking of this work and the jungle training course. Hopefully, I will gain even more experience and knowledge of it in the future.

1.2 Aim and research questions

The aim of the research is to clarify the problems and limitations that occur when conducting warfare in the jungle and draw some general conclusions from the research. The study will also be illustrated by examples of jungle conflicts that is present today and some parts of the jungle warfare history, throughout the second half of the 20th century.

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Main question:

- How does the Swedish Armed Forces theory of fundamental capabilities\(^7\) apply on jungle warfare?

Sub questions:

- What defines the jungle environment?
- What impact does the jungle have on warfare seen in terms of the following aspects:
  a) Movement,
  b) Endurance,
  c) Intelligence/Information,
  d) Protection,
  e) Command,
  f) Impact

1.3 Disposition

The first chapter of this paper is an introduction, where the background and description of the research aim is explained but also the demarcations, a clarification of definitions and previous research.

The second chapter describes the methods that have been used in the research.

The third chapter contains the analysis of the collected data incorporated within the research questions and their sub-headings and answers the research question.

The fourth chapter presents the discussion and results of the research as well as conclusions drawn from the analysis but also certain factors that I find important in jungle warfare and have therefore been addressed here. Suggestions for further research and my own personal thoughts, feelings and reflections that I have during my work and my period in are also presented here.

The fifth chapter is a summary of the entire research.

The sixth chapter contains references used.

\(^7\) Försvarsmakten, *Doktrin för gemensamma operationer*, 2005., p. 61
1.4 Demarcations

My research questions make most of the demarcations. However, there are still further limits to my research to be taken into account.

If jungle is to be seen as a terrain section, in addition to the jungle forest itself, all the roads, open fields and villages are included. However, when I write jungle in my research, I am referring almost only to the typical amazon rain-forest (explanation of forest under chapter 3.1). In that way, I have delimited my research to combat in the jungle forest.

That is also the reason why I have written almost nothing about vehicles. Swamps and the thick forests found in the jungle, make the use of vehicles in most cases impossible.

I have chosen to take examples from two jungle wars in history and one current conflict. If I would take more than three, I would have difficulties reading all the literature in time and my research would not have the same quality. The three examples are:

- Indochina
- The Vietnam war
- French army operations against illegal gold mining in French Guiana

Another demarcation is that I will have a modern western army perspective throughout the research. That means that I will base my conclusions on tactics, training, vehicles and weapons typical of modern western armies.

There is a considerable amount of literature available about both conventional and unconventional warfare in the jungle. I have chosen not to look into the differences, but only focus on the jungle combat itself.

My research is mostly on a tactical level because I look at how platoons work, and in French Guiana I observe how squads and platoons act. At times, I focus on the operative level to get an overview and to look at jungle warfare as a concept, while at others, I direct my attention further down at the technical level and, for example, discuss how to build different stretchers to transport a wounded through the jungle.
I have to look at jungle warfare on different levels in order to obtain a grasp of what it really means, gain an understanding of how the jungle environment can place the simple soldier at the bottom of the hierarchy under great duress and how it affects warfare on all levels up to the planning table.

1.5 Terminology

I assume that the readers have a military background or some knowledge of military subjects and therefore some understanding of the fundamental military thinking. The following acronyms will be used throughout this study:

- **FARC**: Fuerzas Armadas Revolucionarias de Colombia, Revolutionary Armed Forces of Colombia, a Marxist revolutionary guerrilla force involved in armed struggle against the government of Colombia.\(^8\)

- **EU**: European Union, a union established in 1993 who deals with economic, political and security questions in Europe. EU have also created a central European bank for a common currency, the Euro.\(^9\)

- **EUFOR**: European Union Force, is a term used to describe European Union military deployments, and has been used three times so far since 2007. EUFOR is a temporary military deployment, not a permanent military force.\(^10\)

- **UN**: The United Nations, an international organization whose stated aims are facilitating cooperation in international law, international security, economic development, social progress, human rights, and achievement of world peace. The UN was founded in 1945 after World War II to replace the League of Nations, to stop wars between countries, and to

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\(^8\) The Free Dictionary, 'FARC' [Webpage], in The Free Dictionary Farlex Inc.  


provide a platform for dialogue. It contains multiple subsidiary organizations to carry out its missions.\textsuperscript{11}

- **UNMIL**: The United Nations Mission in Liberia, a peace-keeping force established in September 2003 to monitor a ceasefire agreement in Liberia following the resignation of President Charles Taylor and the conclusion of the Second Liberian Civil War.\textsuperscript{12}

- **Medevac**: Medical Evacuation, an air or ground transport of persons to a place where they can receive medical or surgical care.\textsuperscript{13}

- **STABO**: Stabilized body, an extraction which allowed military personnel to be rescued by helicopter from field locations which prevented the conventional landing and boarding of a helicopter.\textsuperscript{14}

- **Hearts and Minds**: In the areas of fighting, win the local population trust and liking, hearts and minds.\textsuperscript{15}

- **CEFE**: Centre d'Entraînement à la Forêt Equatoriale, in English: Jungle Training Center. The center is a part of Third Infantry Regiment of French Foreign Legion that is located in French Guiana, 180 km from the town of Kourou, and offers several courses in jungle training and jungle combat.\textsuperscript{16}


1.6 Previous research

There is a great deal of literature about wars in a tropical environment, for example The Vietnam War, Indochina War and the war against the FARC guerillas. For my research, which only is about jungle warfare in the forest and on a more tactical level, there is not so much. This is because history books can be written even if the author has not taken part in the events described, jungle warfare on a tactical and technical level, on the other hand, is hard to write about if you have not experienced it yourself. The west has little experience of jungle warfare, and consequently very little has been written about it.

2. Method

2.1 Systematizing

My work consists of three parts.

1. Research - I scan internet and libraries for literature, read and talk to persons with expertise on my subject.
2. Writing - I put my research and findings into writing and draw conclusions.
3. Experience and observe – I do a 2 weeks jungle training course at CEFE. After the course I add things that I find vital for my subject in the text from my experience in the course.

For my research I will use the method of qualitative literature analysis and observation analysis.

The method of qualitative literature analysis

The base in a qualitative literature analysis is different kind of texts such as newspapers, documents, diaries, books and articles or verbal statements (in form of notes from observations, interviews, conversations, discussions etc.). It is as it sounds, a method of carrying out research by reading or experiencing qualitative data.17

Even if documents and discussion/observation data have two different origins, they are still analyzed in the same way. The importance is that the main point is found and brought up and because of that, the same method, qualitative literature analysis, is used.\textsuperscript{18}

Most of my work is text-based such as books, articles and internet websites but also based on discussion with my subject mentor and academic supervisor, therefore constitutes qualitative literature analysis.

\textbf{The method of observation}
Preforming an observation analysis means that the researcher is in place to observe things that are important for his hers work and registers the impressions mostly by listening and watching. Observation often gives the researcher access to information that other technique such as questionnaire studies or interviews never could.\textsuperscript{19}

\textbf{Participating observation}
The researcher can also take part in the environment or the object that he or she is observing and if so, there are different roles that he or she can take on. Sometimes there are already roles that are established and that the researcher in a natural way can jump into. Often it is a role as an apprentice, and therefore it may be easier to ask naive questions.\textsuperscript{20}

The method of participating observation is an excellent way to get a first-hand perspective and experience of a special subject, and in that way gain a greater understanding of the environment or the research object. There are, however, certain factors to be aware of when participating. One is that the researcher risks becoming so involved in the participation that he forgets to observe. Another is that the researcher becomes so focused on the environment, objects and people that are closest that he or she loses therefore the greater picture. Being in close to the group that is observed may also render the researcher’s opinions and/or impressions subjective, which reflects in their work and therefore stops the work from maintaining objectivity.\textsuperscript{21}

Other elements that also have to be clarified are the level of openness in the participating observation. Complete openness is when everybody knows that they are being observed, while

\textsuperscript{18} Johannessen, Asbjörn and Tufte, Per Arne, \textit{Introduktion till Samhällsvetenskaplig Metod}, 2010, p. 105
\textsuperscript{19} Ibid, p. 88,89
\textsuperscript{20} Ibid, p. 93
\textsuperscript{21} Ibid, p. 93
partial openness is when only part of the group knows that they are being observed and covered observation is when no one in the group knows that they are being observed. In some cases, the knowledge of being observed changes people’s actions and therefore it might, then be better not to make the group aware of the observation.\(^{22}\)

I used the method of participating observing when I was at CEFE in French Guiana, where I took part in a jungle training course to observe how things are done, and experienced it myself. In that way I can check if what I have written is true and correct. I also gain a much better understanding of jungle warfare if I experience it myself, instead of only reading and writing about it.

In my case, I did the jungle training course with fully open research perspective, which means that everyone knew that I was participating in the course and observing at the same time. I considered the risks of affecting the group and the instructors, of changing their actions by telling them about my research, to be very small, and did not experience that the instructor treated me differently than the French cadets at CEFE.

Firstly, the cadets and the instructors are used to foreign cadets. The French cadets have had foreign cadets as a part of their platoon several times during their time at officer school and the instructors are used to foreigners on the course. Consequently, I will not seem unusual to them or constitute an intrusion.

Secondly, my work is about jungle warfare and not about grading the Foreign Legion, the French cadets or the jungle training course, even if I was to take lessons from them/about jungle warfare. And even if I would been there to grade them, my work would not change their way of doing things because they have a exercise plan they have to follow and as the inexperienced and non-famous author that I am and the publishing of my work will only be at the database of the Swedish Defense College and will therefore not affect them or their work.

During the course I did write down lessons learned and notes to put in my research whenever I could but there was not so much time over for reflection before the return from the course. I did not write something in my research during the course, only after, but it is probably for the better because after the course I had time to reflect over my newly gained experiences.

\(^{22}\) Johannessen, Asbjörn and Tufte, Per Arne, *Introduktion till Samhällsvetenskaplig Metod*, 2010, p. 93
2.2 Theoretical background

I have chosen to use the Swedish Armed Forces theory of fundamental capabilities\textsuperscript{23} as a way to break down, make it easier to understand and get an overview of jungle warfare.

The theory of fundamental capabilities is developed by the Swedish Armed Forces and used to describe and analyze military operations.\textsuperscript{24}

2.3 Validation and reliability of research material

The research is based mostly on two books and discussions with two persons.

\textit{Jungle Warfare by J.P Cross}

Of his 39 years service in the British military, more than 37 years were spent in Asia where he served as a Gurkha officer. After fighting in many conflicts and war in South East Asia, for example the Malayan Emergency, J.P.Cross has an unrivalled knowledge of jungle warfare.\textsuperscript{25}

\textit{Vietnamkrigen by Marco Smedberg}

Marco Smedberg is a military historian, Lieutenant Colonel in the reserve and a member of the Royal War Academy of Sciences. He is an expert in military leadership and has written several military historical books, including; About the Basics of Combat (1994), Military Leadership (2001), Warfare (2004) and The Outbreak of Second World War (2007).\textsuperscript{26}

\textit{Lieutenant-Colonel Daniel Kopecky}

Currently head of international relations department in Les écoles de Saint-Cyr Coëtquidan. Formerly Military Attaché for Surinam and Guiana, International relations officer in French Guiana in charge of relations with the Brazilian Army in Amazon region, and organizing International Jungle Warfare Course in CEFE.

\textit{Lieutenant-Colonel Alain Walter}

Former chief Training and operations bureau (G3) of the Third Infantry Regiment of French Foreign Legion, future Regimental Commander of the same regiment (in summer of 2013), Jungle Trained and responsible for Jungle Training.

\textsuperscript{23} Försvarsmakten, \textit{Doktrin för gemensamma operationer}, 2005., p. 61
\textsuperscript{24} Försvarshögskolan, \textit{Lärobok i Militärtéknik, vol. 5: Farkostteknik}, Välingby: Elanders, 2010., p. 18
\textsuperscript{26} Smedberg, Marco, \textit{Vietnamkrigen}, Lund: Historiska Media, 2008., p. 1
3. Analysis

3.1 What defines the jungle environment?

The jungle is an unwelcoming environment for men. J.P. Cross asserts that even if some people have been forced to live in the jungle, or settled there to hide\(^27\), they always seek to live in an open place, so they cut down the jungle to make an open areas where they can live.\(^28\)

The jungle covers a band at 15° latitude on both sides of the equator and the closer you get the less variation there is in climate. The forests contain an infinite variety of trees and plants that is watered by the large amount of precipitation. The mix of the heavy rain, strong sun and the heat leads to high humidity levels, often over 90%. It is also beneficial for growth and there are over 800 species of trees and plants. Some trees can grow up to 40 and 50 meters high.\(^29\)

Summer and winter do not exist. Instead there is a difference in rainfall. Monsoon rain constitutes the only real difference in weather, making it wetter, moister and a less warm because of the water. The average temperature is between 25 and 27 degrees Celsius all year around.\(^30\)

The big leaves and the thick treetops, and that it is close to the equator, causes the light to come and disappear very fast and this compels dwellers to think ahead, for example about when to set up camp for the night. Dawn and dusk are always at around 6 o’clock. When it is night, it is really dark. Without any light source during nighttime you cannot see anything.\(^31\)

Streams and rivers are common because of the large amount of precipitation. If a stream becomes blocked, a swamp is often formed, and is very difficult to pass. In order to pass a swamp, troops have to be very good at navigating to keep going in the right direction.

Both animals and humans make paths in the jungle that can be used to save time and energy, but these are almost never shown on maps.

\(^{28}\) Cross, J.P., Jungle warfare, 1989, p. 16
\(^{30}\) Ibid, p. 3
\(^{31}\) Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
As may be seen on the picture below, the topography can change drastically. There are high hills as well as deep valleys. The rivers in the valleys are usually wide and slow and in the hills it is the opposite, deep narrow and fast. The water level can rapidly rise after rainfall. The rainfall can be in the hills, far away from person’s location, and yet affect the river nearby that person. If troops are not aware of this, the suddenly rising water levels may surprise, and cause a great deal of problems. The lesson to be learned is that a good place to set up camp should always be determined, and troops should always plan for managing with high water levels.

Even if the camp or a track is not near any rivers or streams the water can cause you problems. A track or a camp can become really muddy if the rainwater has no possibility to drain away, a little slope could be a good place set camp for the night.\(^{32}\)

A 15 cm rainfall in one night can make the water levels rise over 3.5 meters\(^{33}\). If this happens the surroundings of the rivers will flood, including all the possible helicopter landing places and all the smaller bridges will be washed away.

The heavy rain causes problems when having to to navigate a boat on the river, as the map is no longer reliable because of all the new streams that occur.

According to Lieutenant Colonel A. Walter there are two main types of jungle forest:\(^ {34}\)

\(^{32}\) Cadet V. Henning, personal experiences from CEFE 1-21/5/2013

\(^{33}\) Cross, J.P., Jungle warfare, 1989, p. 13

\(^{34}\) Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l’action terrestre’ [Article]., p. 1
Primary forests

These are original forests are untouched, and consist mainly of high trees. The trees are high because they compete for the sunlight in order to survive and the tallest one obtains most sunlight. The roots are weak because of the large quantity of water in the soil, and the trees can therefore fall without warning. A falling tree can create a domino effect when falling into another tree that falls into another and so forth. **Visibility is limited to about 30 meters in all directions.**

The swamps, the thick forest and the hilly terrain make the use of vehicles almost impossible, but it is possible to go by foot. The biggest obstacles are streams, rivers and flooded areas.\(^{35}\)

Secondary forests

This kind of forest was once a primary forest, but was cut down to benefit farming. This allows the sunlight to hit the ground and thick undergrowth to grow two to three meters per year!

Going by foot through this type of forest takes a very long time, is very noisy and sometimes impossible. **Visibility is often less than 10 meters in all directions.**\(^{36}\)

In the book Jungle Warfare by J.P. Cross the author describes a third kind of jungle forest:

Coastal forests:

At the coast, the jungle changes shape. It is more open, there are many mangrove swamps and 1.5 – 2.5 meters of high grass. The grass causes even warmer temperatures by retaining the heat from the sun and this reduces the opportunity for observation. Near the populated areas coconut groves may be found.\(^{37}\)

\(^{35}\) *Ibid*, p. 1
\(^{36}\) *Ibid*, p. 2
3.2 What impact does the jungle have on the warfare in terms of the following aspects:

Movement,

It is hard to orientate in the jungle because the jungle can rapidly change due to the weather: the visibility is very limited and the maps are often not accurate, partly because of the weather changing the environment very quickly and partly because of maps that are often not up-to-date and therefore unreliable. GPS connection is also a problem due to the large treetops that block the signal: the satellite link for GPS works only in open spaces. Maps may also have a lack of resolution of details.\(^{38}\)

A technique for orientation in the jungle is to set a compass direction towards a point on the map, and then the soldier sent away his pair-friend in the direction set on the compass until he almost no longer can be seen and then stop. Once the soldier has made sure that his pair-friend is exactly in the right direction of the compass, the first soldier goes straight towards his pair-friend and counts his steps until he reaches his pair-friend. Then they repeat the procedure. In that way they know in which direction they are going and by counting the steps they know approximately how far they have gone. In that way they can keep track of where they are on the map even if the jungle is thick and there are no landmarks.\(^{39}\)

When the American war minister was visiting the troops in Vietnam in January 1964, it was found that one of the two things that were needed the most were better and more accurate maps.\(^{40}\)

Poor maps and the changes in the environment present two considerations that make going in the right direction a challenge. Accurate orientation is vital for the troops to determine the best way through the jungle, and there are several ways:

By water

Even if motorized transportation is difficult in a jungle environment, certain ways are available. One is to use the natural waterways, such as rivers, lakes and streams. Due to the lack of roads, the waterways are frequently used and are therefore called “the highways of the jungle”. It is a huge advantage to go by motorboat because enables the transport of troops and equipment, fast and

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\(^{38}\) Lieutenant Colonel Daniel Kopecky, 11-04-2013  
\(^{39}\) Cadet V. Henning, personal experiences from CEFE 1-21/5/2013  
\(^{40}\) Cross, J.P., Jungle warfare, 1989, p. 164
effectively. Unfortunately, using boats for military operation in the jungle does present certain challenges.

One downside is that there may be a labyrinth of rivers and streams, especially difficult to face when they are flooded, because then the maps do not match the environment. One solution for a lack of knowledge about the terrain that you will operate in is to use locals as guides. They hunt on the lands and fish in the rivers and have therefore a good knowledge of the area.

Guides should be chosen carefully. The enemy could pay the guide, or the locals, to provide them with intelligence, for example the location of military units and numbers of troops.

Another downside is that moving by boat forces the troops to go stay on the rivers. It is along the waterways that the people and villages are and therefore it is difficult to use the rivers unnoticed. Again, if you want to stay hidden or to move unnoticed, using motorboats is not the best way of transportation.

A motorboat makes a considerable amount of noise, which means that the risk of being detected by the enemy becomes greater. Using a canoe is a possibility for a unit to stay quiet, but on the other hand, it is not nearly as fast as a motorboat and there is far less capability for transportation of equipment.

The different shapes of the river may cause a number of problems. The rivers can sometimes be very narrow, deep and fast, sometimes they can be wide shallow and slow and sometimes they can be currents, like the one on the picture to the above. It may clearly be seen that it is no problem going
by boat in the lower and upper part of the stream, but in the middle, going by boat is dangerous, due to the current and the boat will capsize and be destroyed on the rocks.

If there is a current that must be passed, the boat must be dragged up onto land and rolled on logs along the waterline until calmer water is reached where the boat may be put back in the water and the move continued.

**The biggest downside with using boats is that it is noisy and that one is forced to stay on the river, on which there are only two directions – up or down. This makes the moving military unit predictable, and it is easy for the enemy to do an ambush.**

**By air**

Moving by air is also an option, and using airspace for transportation is a very favourable choice because there are no limitations on the direction of moving, no road or river that must be stayed on, and there is much greater freedom in maneuvering.

There are two ways to move by air: helicopter and airplane.

**Helicopter**

Helicopters in military service are widely used all over the world because of their great flexibility. In jungle combat, they are almost invaluable; they can in some cases cover a longer distance in a ten minute flight than could be walked in a whole day!

One downside is that it needs open and level places to land and take-off. That means that the helicopter has to have a base with a landing pad and launch its air operations from there.

In the jungle, open places where a helicopter can land are rare. In French Guiana the illegal gold miners have developed a simple technique to counter the landing places cleared by French troops. They place log poles of wood vertically around the site and landing areas and consequently, the helicopters cannot land without seriously damaging the helicopter’s rotor blades or jeopardizing the safety for the troops onboard.41

Because of the rarity of open places for helicopters to land in, some techniques have been developed for retrieving and dropping off troops in the jungle without landing.

41 Lieutenant Colonel Daniel Kopecky, 11-04-2013
Insertion techniques:
One technique is HELOCAST, it is when hovering a few meters over a river or a lake and let the soldiers, with all their gear, jump out of the helicopter and into the water, and swim ashore or jump into an auto-inflatable boat and drive ashore (see the picture to the left).

Another technique is fast-roping. To execute fast-roping the helicopter has to hover about 10-15 meters above the ground, toss out a thick rope so it hangs out of the helicopter with one end of the rope attached to the helicopter, and the other end down on the ground and let the troops slide down the rope (see photo to the right, for video see footnote).\(^2\)

Extraction techniques:
To get the troops back into the helicopter without landing, there are two techniques. One is to send down a wire to the troops, let a squad hook up to it and winch them up into the hovering helicopter.\(^43\)

Another technique is the Special Patrol Insertion/Extraction System (SPIES). The helicopter simply sends down a long rope, lets a squad of soldiers hook up to it and just let them hang on the wire throughout the flight see photo to the left (for video see footnote). \(^44\)

In both cases the helicopter must, after a squad has attached themselves to the wire, begin to rise vertically so that it does not put the troops at risk of crashing into trees. The maximum number of persons that the helicopter has the capability to lift at the same time is a squad of up to ten soldiers. The limitation is in most cases not the weight, but the safety of the soldiers. If there are many soldiers to transport there will be a greater risk of tumble due to the wind.


Helicopters are essential for use in jungle combat because they provide great mobility and flexibility but also because the constrained infrastructures. The helicopters are also very vulnerable: a simple measure such as pushing down a long stick into the soil prevents the helicopter from landing near the stick.

**Historical Battle: The Battle of La Drang**

The first time that helicopters were used in large scale in military jungle operations was in the Vietnam War in between the capitalist United States and the communist North Vietnam between 1965 – 1973.\(^4^5\)

The helicopters were used for many tasks, such as troop-carrying, fire support, reconnaissance, command and medical purposes and they still are used the same way today, but the technique has been refined.

In January 1964, the American war minister was visiting the troops in Vietnam. At that time, the Americans had about 3800 troop-carrying helicopters in South Vietnam, and still they found that it was essential to obtain more helicopters.\(^4^6\) This proves helicopter usability in jungle operations.

One big battle in the Vietnam War where helicopters were used was the battle of La Drang. The Americans used air cavalry and flew in more than two battalions to the battlefield by helicopters. Their tactics were based on using transportation by helicopters and a massive firepower, mostly from helicopters and bomber planes.\(^4^7\)

Larger types of helicopters were additionally used to move heavy material, vehicles and artillery canons by attaching them to wires and letting them hang under the helicopter for the duration of the entire flight.\(^4^8\) This is called Sling Load Operations (for video see footnote).\(^4^9\)

The Americans would very often transport artillery canons by helicopter to forward battery places, from where they could give supporting fire to the frontline, and move them often. In this way, the enemy never found the artillery canons before they were moved.\(^5^0\)

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\(^4^5\) Smedberg, Marco, *Vietnamkrigen*, 2008, p. 140
\(^4^7\) Smedberg, Marco, *Vietnamkrigen*, 2008, p. 137-138
These examples are presented to demonstrate the increased tactical mobility opened up by helicopters, especially for the jungle environment that otherwise is so difficult to penetrate.

**Airplanes**

Airplanes are not as multifaceted as helicopters in a jungle environment, but they can come to great use. The problem with airplanes is that they need a take-off and landing strip and, again, open places in the jungle forest are rare, while open places that are hard enough to land an aircraft on are even rarer. If there is a hard runway made of asphalt, for example, it can be used the year around but if the runway consists of hard packed dirt it will become soaked and muddy under the rain season and the planes will not be able to land there. If you have the time and the resources to build a landing strip for airplanes at a base, it would give the logistic system a good foundation, and from the base distribute the material by helicopter, by boat or by foot to the frontline. The downside is that it takes a lot of time, resources and manpower to build the landing strip.

![Picture 6: Jungle from above. Due to the trees the jungle is not suitable for parachute operations.](image)

Another way is to let the soldiers and collies parachute down to the ground but big open areas are required here as well. As the picture above shows, the jungle forest from above has the appearance of a big green carpet.

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Smedberg, Marco, *Vietnamkrigen*, 2008, p. 140
By ground

Finally, there is the option of going by foot.

As the statement above explains, the jungle is a place for Infantry, more than any other branches of the army. This is mostly because of the greater mobility, not in speed, nor in length, but in accessibility.

Logically the jungle is not a place suited for wheeled vehicles because of the substantial amount of forested areas, rivers and mud. Track vehicles have better mobility, but because of their size and weight they are, like wheel vehicles, mostly limited to take the existing roads or tracks.

Armored vehicles are mostly restricted to the roads, where they are predictable, vulnerable and relatively easy targets for a possible enemy ambush. But their firepower compared to infantry is massive and in this aspect, very dangerous.

Armored vehicles, combat vehicles and battle tanks are therefore best used for protecting convoys on roads in the jungle, when roads exist.

Going by foot through the jungle consumes a lot of energy and takes a lot of time. If not following a trail, it takes about one hour to march a kilometer and if you are crossing a swamp by foot this may go as slowly as a hundred meters per hour.\(^{51}\)

This extract from the book Jungle Warfare by J.P. Cross gives an example of how difficult and how short the distances could be from just a day’s walk:

“The slopes of mount Lawson on Yule Island\(^{52}\) were so steep that it was possible for two men to hold a shouted conversation from one ridge to another a whole day’s walk apart.\(^{53}\)"

\(^{51}\) Cross, J.P., *Jungle warfare*, 1989, p. 130

\(^{52}\) Yule Island is a small island in the central province of Papua New Guinea.

\(^{53}\) Cross, J.P., *Jungle warfare*, 1989, p. 15
Local knowledge is always an advantage. Once in New Guinea it took 45 minutes for the locals to walk the same distance that took the British troops one and a half days to walk. The locals know the surroundings and by using their knowledge all the small trails and routes may be found, which saves a great deal of time and energy.

Historical Battle: The Battle of Dien Bien Phu
The Indochina war was between France and the North Vietnamese regular army together with the Vietnamese resistance force in between the years 1946 - 1954. The North Vietnamese wanted independence and this was the reason why they fought.54

Dien Bien Phu is a village that played a significant role in the Indochina war, not only the scene where the biggest battle of the war took place, but also the scene for the battle that lead to the end to the war.55

The village rests on a plateau in the mountains but it appears to be set in a valley because it is surrounded by hills.

The location of the village is 300 km west of Hanoi and 20 km from the border to Laos. The plateau is 18 km long and 7 km wide, and was at that time an important hub because several roads became connected in the village. Just north of the village there was also an airstrip that could easily be built bigger. 56

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54 Smedberg, Marco, *Vietnamkrigen*, 2008, p. 40-44
55 Smedberg, Marco, *Vietnamkrigen*, 2008, p. 74, 84
56 Smedberg, Marco, *Vietnamkrigen*, 2008, p. 74
On 20th of November 1953, the French dropped three battalions of parachutists over Dien Bien Phu. The next day another battalion of parachutist was dropped over the village.

The reason why France took Dien Bien Phu as a stronghold was to cut off the North Vietnamese troops to the south. It would also stop them from going west into Laos and from there launch an attack against the capital of Laos, Luang Prabang.

If the French plan went well, Dien Bien Phu would become such a problem for the North Vietnamese that they would had to do something about it or else their offensive would be stopped.\(^{57}\)

The French were confident in themselves and their capabilities. The brigade commander’s plan was to make offensive sweeps from Dien Bien Phu in order to hunt down enemy forces. In reality thogh, this did not work.\(^{58}\)

France had made some incorrect estimation of the North Vietnamese next move. In the middle of March, the French found themselves surrounded and outnumbered by an enemy five times stronger in numbers.\(^{59}\)

An incorrect estimation was that the North Vietnamese would not be able to put some artillery guns on the hills surrounding the village, because of the thick jungle. But the North Vietnamese did manage to cut down a trail throughout the jungle and pull the artillery guns by hand, cm by cm, to the top of the hills. This took several days to do. The ammunition also had to be carried by foot up to the hilltop.\(^{60}\)

A North Vietnamese division commander wrote:

“The newly build roads was soon covered by mud and the soldiers sunk down to their ankles. To get uphill there were hundreds of soldiers pulling ropes that were attached to the artillery guns […] It was even harder to hold back the guns when it was downhill. On the narrow trails the canons felt even

\(^{57}\) Ibid, p. 74
\(^{58}\) Ibid, p. 76,77
\(^{59}\) Tucker, Spencer C., Vietnam, London: UCL Press, 1999., p. 73
\(^{60}\) Smedberg, Marco, Vietnamkrigen, 2008, p. 79
heavier in the turns. [...] All night long the men worked in the light of flashlights to manage to pull them between five hundred and a thousand meters per night.61

The French artillery commander Colonel Charles Piroth was so certain that the artillery of Viêt Minh would not be able to cause any problems that he declared:

“No Viêt Minh artillery gun would be able to fire more than three rounds without being located”

– Colonel Charles Piroth, artillery commander at Dien Bien Phu 62

Because of these guns, the North Vietnamese could fire down on the French stronghold, mostly with direct fire, simply aiming down their gun tubes from the hills around Dien Bien Phu.63

France tried, with their air supremacy, to bomb these artillery guns, and other North Vietnamese activity, but had a hard time just determining where the enemy was, partly cause of the tree canopy that covers enemy activity, and partly because the enemy was good at camouflaging themselves.64

61 Smedberg, Marco, Vietnamkrigen, 2008, p. 79
62 Tucker, Spencer C, Vietnam, 1999, p. 73
63 Ibid, p. 75
64 Ibid, p. 75
This battle was won by the North Vietnamese, partly because they succeeded in placing artillery guns on the top of the surrounding hills, but the victory was costly. With 7900 dead and 15 000 wounded, they lost 46 % of their fighting units.

**Mobility is difficult and it takes time, but with determination, it can be achieved.**

**Endurance,**

In this chapter I will bring up logistics, administration and other factors that affect the endurance capabilities of a western military force in a jungle environment.

In the jungle, as in many other extreme environments, there are two enemies. One is the human enemy, the one that tries to kill you with violence- the one who shoots at you. The other enemy is the environment itself, with all the challenges it offers you.

In order to win a war, both have to be managed. Manage only one of them will result in failure. The jungle does not take sides, but puts the same pressure on anyone that enters it. This means that neither side will have an advantage, unless one side is trained and prepared for the jungle environment.

In order to kill the enemy it is crucial to learn how to manage the jungle. If don’t, the jungle will itself will become the worst enemy. If the enemy does not manage the jungle, it will kill him. If a unit is trained to manage the jungle and his enemy is not, then the jungle will kill him for the unit.

Consequently, the jungle may be utilized to one units benefit if they are trained for it. **The one who wins is the he who is able to survive the longest period of time in the jungle, and the key factor is to be trained for jungle combat.**

If the troops are able to handle the tough environment, they will not only increase their endurance in the field, they will also have a big advantage over an opponent who is untrained in jungle combat. **The jungle itself may very well reduce the enemy to a state where he is no longer able to fight because of diseases, infections and skin problems.**

When the soldiers go into the jungle to conduct an operation, they have to bring everything they need for the entire operation. Food, medicine, ammunition, weapons, gear to clear a landing place
for an eventual helicopter in the jungle and all the standard military gear such as night goggles, extra cloths, hammock etc.65

If the mission requires it, in addition to all the other materials, troops must also bring support firing weapons like a GPMG (general-purpose machine-gun), an 8,4 cm Carl Gustav recoilless rifle, mortars and of course ammunition for all the weapons.

The weight that the soldiers carry does make them tired, preventing them from being able to walk as far or keep the same pace as they might under other conditions or in another environment where they have access to a logistic system, and this therefore decreases their endurance.

Overheating is a life threatening condition that often occurs in hot and humid weather when the body loses a great amount of water and the body can no longer control its own temperature.66 The chance of overheating also becomes bigger if the soldiers are carrying a lot and working hard for long stretches of time. The wet and compact clothes and gear does reduce the body’s ability to sweat and cool down, which can lead to overheating.67

Overheating is most common in a jungle environment of the type secondary forests (see chapter 3.1 for explanation), because in primary forests there are big trees that give shade to the soldiers, while in secondary forests, there is no shade.

After a rainfall or after passing a river you will be soaked, and if the weather is cloudy or it is night you may become cold and hypothermia becomes a threat. The soldiers must know what happens with their body when they are cold and know how to work against the cold.

Sometimes, for an operation in the jungle, the soldiers can be supported with transport or logistics by helicopter or airplane. The helicopter requires an open space in the jungle and the airplane needs an airstrip. Open places are rare, as mentioned earlier. It is for times like these that the soldiers carry gears to cut down trees and make a landing place for a helicopter.

65 Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l’action terrestre’ [Article], p. 4
For an aircraft to drop supplies to the soldiers, an open space is required. Therefore it does not work in the jungle.

There are a great variety and quantity of insects and animals in the jungle. Insects attend to spread diseases, and there is always a risk of getting stung or bitten. Cuts and sore feet are a very common problem because the skin is almost always wet and in the jungle, there are a lot of sharp leaves that cut unprotected body parts like hands and face and there are some plants that often occur that have pins and if you are not aware, you get stung. Due to the hot and humid weather, all wounds tend to get infected much faster and more frequently. It is crucial to disinfect as often there are a possibility. At CEFE, I spent about 30 minutes each day taking care of my wounds and rashes and taken action to prevent more wounds by for example taping my feet.  

Soldiers that are untrained to the jungle conditions may experience that the biggest fear is to get bitten or stung by snakes, scorpions or attacked by a leopard or a puma. Even if that is possible, and very dangerous, it is not the biggest threat, mosquitos and other small insects are. There is the main problem of Leishmaniasis, a disease that is spread by sandflies, has a peak of transmission during and after rainy season (like many other diseases), and cause different afflictions, from local wounds that heal by themselves to infections with a lethal outcome. Therefore the troops must protect themselves.

A good way to prevent getting bitten or stung and therefor getting sick is to wear long sleeved clothes, eat malaria pills, use a mosquito net, use mosquito repulsive spray and use specially treated clothes. It is required to carry a good supply of medicine with you on patrols if something would happen and the medics have important tasks. The French Army in French Guiana has a medic in each platoon.

In case of a more serious wound, using a helicopter (if there is a landing-zone around) or a boat as a MEDEVAC is the fastest way to get the wounded to a medical center. There is also the problem with transporting the wounded from the incident site to the pickup point for the MEDEVAC, and there are different solutions. The easiest and fastest way is perhaps to transport the wounded on a stretcher,

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68 Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
70 Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l’action terrestre’ [Article]. p. 4
and it is quite easy to make one out of what you can find in the jungle and part of your personal material.

There are different types of stretches depending on how and where the wounded person is hurt (for example there are stretches that stabilize the neck), and how far the wounded should be transported.

The base in a provisional stretcher is a long and narrow log made of yellow wood that is capable of lifting a person. There are three different types of wood in the jungle, white, yellow and red. For building a stretcher you want to use yellow wood because white wood is not solid enough and the red wood is too heavy.  

Then there are different variations of how to build the stretcher depending on what equipment that is available. A log, a net hammock and some safety snap hooks is one variant. A log and a rope is another variant and two logs and four jackets is a third variant.

In the jungle, finding water is easy, it is to be found everywhere in the jungle but far from all water is drinkable. To get drinkable water is hard because most of the water contains harmful bacteria and/or parasites that, if ingested, can cause sickness. Water must be boiled or cleaned using water tablets. These skills can only be achieved by training and knowledge. Again, training before conducting jungle warfare is vital.

Another impact on the endurance of the soldiers is hygiene. Good hygiene is critical for endurance, if the troops do not have good hygiene diseases will spread and small wounds and sore feet will soon become infected.

Vo Nguyen Giap was a four stared General and the commander of the North Vietnamese army at the time when the battle of Dien Bien Phu took place. During the battle the conditions were horrible and they became even worse when the monsoon rain started. The dreadful conditions together with the high number of casualties (not only from the fighting parts, but from all parts of the army) lowered morale considerable in the North Vietnamese army.

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71 Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
72 Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
General Giap wanted to change the trend and gave therefore special orders, also regarding the hygiene. There were strict instructions to boil all water before drinking. The soldiers had to: wash their feet in hot water and salt, get warm rice and enough vegetables and meat, at least once a day. The soldiers had to sleep at least six hours per night. He also gave orders that the soldiers should have short hair, cut their nails and change uniform after two to three days.\footnote{Smedberg, Marco, \textit{Vietnamkrigen}, 2008, p. 78}

Even if, in most cases, these orders were very difficult to accomplish under the bad conditions that prevailed, the example highlights an important point. If the commander of an entire army gives an order on micromanagement level about hygiene, then it is very important for the outcome of the battle.

The food is mostly dry to keep the weight down and the soldiers add water to their meals when they want to eat. They should also have the skills to fish and to hunt, if they would find themselves in a situation where they have to survive.\footnote{Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l'action terrestre’ [Article], p. 4}

Fishing and hunting techniques are not learned at short notice, but require training and experience.

To make logistics work in the jungle where it is not possible to use vehicles due to the terrain and weather, there is an old fashioned way; using animals. Mules have been used in several wars to help carry equipment and food to the troops in a landscape without roads. Elephants can also be used to carry both humans and material, but they are not as flexible as a mule and can only walk half a day, after which it must eat and rest. Normally elephants cannot walk in as narrow trails as the mule and they cannot be found everywhere, they also have to be domesticated.

The mental pressure that is put on the soldiers is considerable. Due to the limited visibility in the thick jungle, the soldiers may feel a bit claustrophobic and lonely. This may lead to anxiety if they have not complete confidence in themselves, their group and their platoon.\footnote{Cross, J.P., \textit{Jungle warfare}, 1989, p. 60}

To be able to handle the tough conditions with mental and physical stress and also to improve the chances to fight sicknesses and infections, you must be very fit to fight in the jungle. If you are fit you
will be able to better address the physical challenges therefore the mental fatigue will be easier to deal with.\textsuperscript{76}

To establish good relations with the locals is always desirable. Especially for smaller units like Recon, Ranger or Special Forces that have to operate long-term in the jungle it is a clear advantage that the locals may help if in certain situations or crises. This also have a positive impact on morale.

Locals may also provide shelter and food, which gives the unit a chance to recover and extend their endurance in the operation.

Another factor is equipment. The ability to handle equipment competently, and being able to take care of oneself in the jungle will put less stress on the individual or team and decrease mental strain. It will raise and maintain morale and therefore enable to conduct the operation under longer stretches of time.

Cause of the heavy rainfalls, the ground sometimes become very muddy. Mud binds water and causes problems when it settle everywhere in the equipment and the weapons because it starts to rust if it is not cleaned properly etch day, and even then the rust will appear. This is one reason why the equipment is getting used so quickly and this is also one reason why it is so important to clean and control the equipment.\textsuperscript{77}

\begin{center}
\includegraphics[width=\textwidth]{Picture_9.png}
\end{center}

\textbf{Picture 9: Polluted river in Mana, French Guiana.}

\textsuperscript{76} Cadet V. Henning, personal experiences from CEFE 1-21/5/2013

\textsuperscript{77} Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
gained from air pictures. The mining business gives rivers a yellow color, so when such is detect, there is some digging going on further upstream. On the photo above it can clearly see that the smaller river to the right has this yellow-brown color and the reason is that further upstream, there is an illegal gold mine.

It is also easy to hide a cocaine lab under the big tree tops. Therefore problem appears when a recon unit uses high ground or a helicopter to see the forest from above to search for enemy activity.

Wild animals in the jungle can also be used to collect intelligence. By knowing the normal picture of how it is in the jungle, the sounds and the animals will reveal when something is about to happen.

For example if there is a flock of frightened birds flying in a certain direction, there is usually a cause and keen observation should be made in that direction. If you recognize the normal appearance of the forest, you also recognize the different screams made by monkeys and how their variations in their behavior can mean different things.78

However, sometimes the forest can give you a false alarm;

“Birds and monkeys can be misleading, especially when ears are tuned to listen for a particular sound or set of sounds. I have deployed a company in thick jungle to surround and attack what we presumed was the enemy building a camp. We crept towards our target, tensed at the prospect of a fruitful contact, only to be violent disappointed to discover the unusual combination of a woodpecker feeding off some tree ants, and monkeys, with sticks in their paws, beating the branches of trees.”

J.P. Cross 79

It is not only sounds from animals that can play tricks on the mind, J.P. Cross also describes that a stream running and “gurgling” over stones caused the lead scout to report voices, and that this happened more than once.80

78 Cross, J.P., Jungle warfare, 1989, p. 38
79 Ibid, p. 38
In the jungle you cannot see far, but the sound travels far. Sounds become vital for gathering information about what happens around you, so to stop regularly and just listen is a good idea. Therefore it is important to move and work quietly so that the enemy will not hear you. You should for example watch out where and what you put your step on and lead your unit with signs, as far as possible.\footnote{Cadet V. Henning, personal experiences from CEFE 1-21/5/2013}

The locals are a great source of intelligence because most of them live by the “highways” of the jungle; the rivers. However, it is important to value the veracity of the information and be aware that people always have a purpose for the information they impart.

In addition, the natives tend to know all the trails, the river ways, what had happened in the past in the area, etc. It is vital to be wary about interaction with the civilians, as there are never any guarantees as to which side they are on.

The artillery guns needs open places to go into position and fire but because of the thick jungle it is hard to find these places. The alternative is to cut down trees and to even out the ground, but for that engineers are necessary. A solution that The French Infantry in Guiana uses is to provide their men with special equipment and training so that they can do it themselves. The best alternative for short-range fire support is mortars since they fire almost vertically but it is difficult to control the fire effectiveness because of the limited visibility.

Penetrating the jungle takes a great deal of time, which means that the company and battalion commander have to include the reconnaissance force in their warning order and send them away long before the rest of the unit, so that they have time to scan the areas.\footnote{Cross, J.P., Jungle warfare, 1989, p. 62}

Tracking skills are needed to fight an enemy in the jungle, especially a war against guerilla, because they tend to hide in the jungle and to find them you must look for the traces they leave, and follow them to their base.

**Protection,**

Because the jungle is so difficult to access, most people who live in the jungle do it because the jungle provides great coverage and protection. Many guerilla groups base their organization in the

\footnote{Ibid, p. 38}
jungle to avoid being found by government troops and to work safely. It is a tactical move by the guerilla to choose to work in the jungle because they know that a total control over the jungle is impossible. They launch their attacks from the jungle and can therefore use the element of surprise.\textsuperscript{83}

For guerilla groups like the FARC in Colombia, the jungle is a lifeline, because they get their funding from the drug trade which also is based in the jungle, where they build up a camp and hide from the army.\textsuperscript{84}

**Special Warfare Combatant-craft Crewman (SWCC)** is a special unit in the United States Navy. They are specialized in supporting special operations on coasts and rivers. They are doing much of insertions and extractions.\textsuperscript{85} They have also identified the problem with being venerable for ambushes on the river and their solution is to increase the firepower. When shooting massively and gain fire superiority, it literally pushes the enemy’s heads down, and therefore they control the situation, and protect themselves in that way.\textsuperscript{86}

\textsuperscript{83} 3ème Régiment Étranger d’Infanterie Centre d’Entraînement en Forêt Équatoriale, *‘Combat 1: Generalites sur le combat en milieu equatoria’,* accessed 2013-05-27., p. 3
But the firepower is for no use if they don’t move. With the fire superiority, the SWCC takes the initiative but only for a moment, they have to move otherwise the enemy will maneuver and attack you from a different direction or call for help. Therefore, if there is a hot extract it has to be quick.\footnote{Ibid, 08-04-2013}

To protect yourself and your units in the jungle you have to be pro-active. To camouflage the equipment, vehicles etc. is crucial and if the enemy does not see you in the first place, it may not even be necessary to use protection. The camouflage has to be lightweight and adapted to the vegetation.

In Dien Bien Phu, the North Vietnam army was good at camouflaging themselves. For example the French left their artillery relatively unprotected in open trenches and it was therefore easy to locate and to target, unlike the North Vietnamese who camouflaged and positioned their canons in the cover of the jungle.\footnote{Smedberg, Marco, Vietnamkrigen, 2008, p. 81}

Because of this, the French had a hard time finding the North Vietnamese positions around Dien Bien Phu, and their bomb strikes were not effective.\footnote{Tucker, Spencer C, Vietnam, 1999, p. 74}

This came to be the main cause of the French casualties: 75 % of the French troops at Dien Bien Phu died or got wounded because of North Vietnamese artillery fire.\footnote{Ibid, p. 75}

The outcome would probably not have been the same if the French artillery had been dug down and camouflaged, or if the North Vietnamese had not camouflaged their positions as well as they did.

Body armor is not used in jungle combat because it prevents the body to sweat and thereby inhibits the body’s own cooling system. The risk of overheating becomes imminent is the soldiers are wearing body armor.

Command,

The Vietnam War is called “the lieutenant’s war”, because most of the command in the combat relied on the platoon commander. They were supposed to ensure that their men won the initial battle and by radio call for support fire, reinforcements and evacuation of the wounded.\footnote{Ibid, p. 75}
In La Drag, the North Vietnamese forces knew that the Americans had superior firepower and that if they attacked with the same amount of troops as on the American side, they would lose. The American response was to send out units in platoon size so that the North Vietnamese would dare to attack, and then the platoon commanders led the attack with the support of superior firepower from artillery, aircrafts and helicopters.\(^92\)

This tactic works for an army with great resources. In most cases, it is not an army that is fighting the jungle war, and the fighting units do have limited resources. That means that the units have to be organized and trained differently. For example there are great difficulties with radio communication in thick jungle. The thick forest interferes with this, reducing effectivity, and both the reach and the quality of the radio are impaired.

The radio that works best is high frequency radios (HF). Most radios works better by rivers and roads than in the forest because of the trees and if communication over a longer distance is required, the satellite phone can be used. This, however, does not work everywhere because of the canopy coverage, and an open place is needed to make calls.

Similar problems may occur with visibility, due to the vegetation. In most cases in an open terrain, the platoon commander can look at the terrain and at his squads and gain an understanding of what is happening. After that he makes up his mind how to maneuver and gives his orders. This is, in most cases, a process that is hard to make work in the jungle.

**Problems with the radio and vision results in problems with the command.** If the platoon commander cannot see what is happening to his squads in front and does not have a clear picture of the situation when the first squad gets into a firefight, he will have difficulties making good decisions.

The situation is even worse when it is dark. The evening of 7\(^{th}\) of May at Dien Bien Phu the isolated garrison Isabelle was the only French garrison left that had not surrendered to the North Vietnamese. At nine o’clock in the evening the 1700 manpower strong garrison tried to break out through the surrounding North Vietnamese forces but the main force was stopped in a confused

\(^{91}\) Smedberg, Marco, *Vietnamkrigen*, 2008, p. 142  
\(^{92}\) Ibid, p. 142
battle in the dark. Only about a hundred men succeeded in penetrating the North Vietnamese lines and started a 200 km march through the jungle towards French units.93

In the jungle, due to the limited vision and problems with the radio, half of the leadership of squad and platoon commanders is physical. The leaders must run a lot and they have to lead from the frontline with their body language.94

Impact

Jungle warfare is similar to urban warfare in several aspects. Due to the short distances, the soldiers must react instinctively and the first man in each squad always carries a shotgun.95

The short distances and the vegetation means that the soldier who gets into a duel has to be able to identify a friend or foe fast. It is inevitable that uniforms become dirty, making it even harder to separate friend from an enemy in a situation where swift action is needed.

Blue on blue fire is considerably high, and even more so when fighting in the dark.

To fight during the night is not optimal and it is something that you avoid. The night goggles does not work so good in the jungle, but sometimes you might use them to walk on tracks during nighttime.

The 5.56 caliber ammunition is stopped or has its direction changed quite easily by the vegetation. The 7.65 caliber is better.96

The bullets may easily change direction when hitting a tree, and because of that it is very important to always know where the rest of your squad and platoon is and not to make jumps that are to large when executing a fire maneuver.

Using indirect fire in the jungle as fire support is hard; there are several things that have to work in order to enable indirect fire. The artillery guns must be placed in open areas and to find these areas the recon patrols must have time. There are also the problems with the limited effectiveness of radios and the difficulties of observing the effect on a target from a safe distance from the blast site so that an effect report can be given to the artillery.

93 Smedberg, Marco, Vietnamkrigen, 2008, p. 84
94 Cadet V. Henning, personal experiences from CEFE 1-21/5/2013
95 Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l’action terrestre’ [Article], p. 6
96 Walter, Alain (LCI), ‘Article sur le combat en forêt équatoriale Dictionnaire de l’action terrestre’ [Article], p. 5
Because it takes a long time to find places where to place the artillery or to cut down the trees and even out the soil, small independent units takes mortars with them to provide their own fire support. Mortars are lighter and can be man-carried, providing a considerable advantage against big artillery guns. On the other hand, mortars do not provide as much firepower as artillery. This forces infantry men to know how to be able to fire mortars, a capacity that could only be achieved by specific training.

The commander’s role could be extremely challenging, leading units may not be seen. The limited line of sight makes it difficult to have supporting fire, or to give fire arcs to the men.

In the position of platoon- or company commander, it is always important to think of how to maneuver with the squads or platoons to always ensure fire support within and between your units. At the same time, in the jungle, this is difficult because of limited visibility. The short distance between trees makes the bullets turn fast and it is risky to carry out encirclement for example.

Present Battle: Operation Harpie
In February 2008 the French military started an operation in French Guiana in order to reduce the illegal gold mining. The Operation was named Operation Harpie and lasted a couple of months. Illegal mines were closed down and the workers (mostly illegal immigrants from Brazil) were sent back to their counties by the French military.97

It is important to stop the mines not only because the of the gold but also because together with the mines follows weapons, drugs, prostitution, alcohol, tobacco, steels and fights between different mines.98

Pollution is also a major issue. Quicksilver is used to melt the small gold pieces together, but not taken care of properly and ends up in the groundwater, in the rivers and in the fishes that the natives eat.99

The operation was successful while it proceeded but when finished, the workers came back and new illegal gold mines were started. Therefore a second Operation Harpie was launched in February 2009,
and this operation is permanent and will proceed over time with different regiment rotating for the mission.\(^{100}\)

During Operation Harpie, most of the time is spent on collecting intelligence and recon assignment by talking to the native and patrolling searching for illegal mines in the jungle.\(^{101}\) The platoons work independently most of the time, which means that they almost never have fire support, but from themselves.\(^{102}\)

In order to make landing places for the helicopter during the Vietnam War, the USA used “Daisy Cutters”. These are bombs the size of a car which are dropped from a transport plane. The bomb was first used in the Second World War and was slightly modified to optimize the effect in the jungle, during the Vietnam War. The bomb exploded above ground and had a massive pressure wave that blasted away all the trees in an area of 80 meters in diameter and cratered a little to no crater at all, perfect for helicopter operations.\(^{103}\)

Grenades work very well in the short distances that the jungle offers and do not reveal the position of the thrower. The downside is that if a tree is hit, the grenade might bounce back, and could therefore be difficult to use.

### 4. Discussion and result

#### 4.1 Answer on research questions

In this chapter I write conclusions that I made from the analysis.

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\(^{100}\) Drelon (Cpt), ‘Opération Harpie’, Képi Blanc Magazine, no. 753, April 2013., p. 24, 29  
\(^{101}\) Drelon (Cpt), ‘Opération Harpie’, Képi Blanc Magazine, no. 753, April 2013., p.27  
\(^{102}\) Lieutenant Colonel Daniel Kopecky, 11-04-2013  
\(^{103}\) Bellis, Mary, ‘Daisy Cutter BLU-82’ [Webpage], in About.com  
Guardian, ‘Afghanistan interactive guide – BLU-82 “Daisy Cutter” bombs’ [Webpage], in Guardian.co.uk  
<http://www.guardian.co.uk/flash/0,5860,588916,00.html>, accessed 09-04-2013.
In order to be able to conduct jungle warfare, units must be trained, acclimatized and prepared for it. If not, the jungle itself will be their worst enemy.

This is the most important conclusion of my work.

Jungle warfare is, on a squad and platoon level, a mixture between urban warfare due to the close distances and intense fights, and artic warfare because of the great adaption to the environment, not least regarding the combat effectiveness.

History throughout the last 50 years shows that the way of conducting war changes because of, new techniques and technology, equipment, weapons and vehicles. On the other hand, the environment and the limitations of the human body have stayed the same. This means that basic combat has also stayed the same, the soldiers still having to adapt their way of living and fighting to the jungle environment in a more distinct way than in many other environments.

The unforgiving jungle environment forces those who enter it to live with it and not against it. If you shall fight here you should be well trained for it and adapted to the high temperatures and specific conditions.

In the jungle, there are stress factors that put pressure on the soldier’s mental health, especially on those not used to the jungle environment and have no experience of it. The sounds might keep you awake at night, you are almost always wet and the visibility is limited and there are a great many animals and insects. Combat is mostly short range and close combat is not unusual.

Due to the tough mental pressure under which soldiers in the jungle must operate, they should be trained always to stay in pairs, regardless of the task they perform. Consequently, their stress will decrease because they know that they are not alone. For those who think that it doesn’t matter if your pair-friend stands 20 meter away or 2 meter away when its pitch dark -it does. After several military exercises in the dark winter of northern Sweden, including above the polar circle, and also a two week military exercises at CFEF, I know that is the case.

It is not only the soldiers who must have a special combat training focused on jungle. There must be a training and understanding on a tactical and strategic level to. For example the members of the headquarters staff must have an understanding of the jungle warfare concept, so that they can plan
operations. They must understand the importance of helicopters and boats for the infantry and modify the logistics because of the lack of roads.

“Infantry was, and still is the paramount arm in the jungle owning to its comparative mobility. Well trained infantry can dominate the jungle. Special training, however, is necessary to accustom troops to the strange conditions of jungle life.”

– J.P. Cross

✓ In the jungle, the war belongs to the soldiers and squad leaders more than anyone else, because of the short distances and the difficulties with fire support.

A solution to the problems with indirect fire could be that the fire effect should be observed from a helicopter, but in that case, there has to be clear guidelines as to where the helicopter can be and where it cannot be in the air so as to not be hit by an artillery shell.

As I mentioned earlier, problems with radio communications and visibility leads to problems with the command. Here I present two solutions in case of a platoon gets in contact with the enemy:

Positive report:

Train your soldiers and your squad leaders to take initiative. If the squad leader in the first squad is well trained he will give the platoon commander a quick but complete report on what is happening in front, how the terrain looks and suggestion for how the platoon commander should maneuver with the squads.

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104 Cross, J.P., Jungle warfare, 1989, p. 59
Standard procedure:

Train to do a couple of standard procedures, for example: if the enemy is known to be weak, keep going forward. If it is a strong enemy, the first squad should take a fire support position (the squad leader gives out arc right and left), the second and third carry out an encirclement right or left and fourth squad stays as reserve. If the enemy is very strong, fire, throw smoke and then pull back. In that way things will go much faster and increases the opportunity for outmaneuvering the enemy.

Orders have to stretch over a longer period of time because command capability and control is limited or reduced. More attention has to be put on the Rendez-Vous and secondary plans “in case offs”, if things don’t go the way they should, for example if the first encounter with the enemy occurs sooner than expected or if someone should become lost after a fight at night.

Everyone must know how and what the commander wants to achieve with the mission, and thereby be able to act independently towards the goal of the mission, if something would happen. This is standard procedure but should especially be applied in jungle warfare where the battle becomes chaotic and hard to lead.

Well trained NCO’s that can make good decisions, take initiative and don’t have to be directed by the platoon commander is crucial and will only be achieved by training. Therefore, again, I bring up the conclusion about training for jungle warfare.

masters

- To gain the natives hearts and minds105 is the key to mobility, to collect intelligence and to some extend also endurance.

Another great example of why it is good to have the hearts and minds is from the Brazilian Army. They have social programs with the people in the Amazon area, which has led to many locals volunteering for the Brazilian Jungle Infantry Battalions. In this way they obtain soldiers who are already adapted to the environment and that have local expertise.

✓ It is important to have air supremacy and be able to use the rivers.

Or at least not let the enemy have air supremacy! To be able to transport troops and material by air and water, to have a fast MEDITAC, air reconnaissance and fire support by air is very important and maybe the backbone of today's modern type of jungle warfare. All the Swedish Armed Forces theory of fundamental capabilities can more or less be applied to the helicopters and boats in jungle warfare. To be able to use the airspace and the waterways without limitation is the fastest and most effective way.

4.2 Suggestions for future research

I chose to only focus on the primary type of forest where only infantry can go, no tanks or combat vehicles, but if you would include all type of terrain that is in a tropical environment, an interesting question for future research could be: How tanks are used together with infantry in a jungle environment (not only amazon rain-forest)?

In amazon rain-forest it is hard for other branches than infantry to move, due to the environment. To do a research about how to interact the artillery, logistic and medical parts of the army in jungle warfare in a better way is a question that needs to be researched more in.

It would also be interesting to do further research on how to best prepare troops for jungle warfare without actually be in the jungle environment, in order to maximize the time spent in the jungle doing the combat course.

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106 Försvarsmakten, Doktrin för gemensamma operationer, 2005., p. 61
4.3 Reflection

I have really enjoyed my time in France where I have experienced the food, the people, the society, the weather and gained a lot of new friends, which I am thankful for. I wish I had more time to spend, because my work has taken most of it.

I have lived in France as a child and spent some summers in Bretagne after moving to Sweden so it is not the first time I have been here, but one thing that I have not experienced before is the French army (at Saint-Cyr Coëtquidan and in French Guiana). And I must say that I am impressed, especially of the endurance of the French cadets, which is very good. I have to add that I found it a bit bizarre that there was such a focus on climbing ropes (I had some difficulties when I was training with my platoon) but it is good upper-body training.

When I first heard that the French cadets were doing a jungle training course I was immediately interested but our tutor in Sweden said that there was not possible for me to go. I flew to France, started my work on jungle warfare and spoke to the cadets in my French platoon who informed me of the dates for the course and I realized that it suited my work perfectly. Subsequently, I investigated the opportunity even though I had been told no, and after hours of discussion and numerous mails and phone calls to everyone from my superior at my Military Academy back home and The Swedish Amassed in Paris, to my superior in Saint-Cyr Coëtquidan, I was given the permissions and equipment that I needed to do the course.

The time that I have spent on administration, preparation for the CEFE jungle training course (including training, collect equipment and uniform from Sweden, buying material, packing etc) and the course itself have taken four and a half to five weeks of my time. I have worked very hard to make it possible and to succeed with both my thesis and the course.

I would like to finish off my reflection with saying that I would be very interested in working with the French army on an international mission in the future and that my time in France has been a tremendously rewarding experience!
5. Summary

Today conflicts ignite fast and can become serious in a short period of time. The trend in western militaries is to have the ability of fast deployment and to be able to conduct military operations in many different environments in order to stop an uprising conflict at an early stage. Therefore, the ability to fight in the jungle is more current now than ever.

My work is a qualitative literature analysis of jungle warfare where I use the Swedish Armed Forces theory of fundamental capabilities\(^{107}\) to break down and get a better overview of the jungle warfare overall. I also use the method of participating observation to gain a better understanding of it. My work is mostly on a tactical level to see how a unit of platoon size acts.

My work resulted in four conclusions about jungle warfare;

- In order to be able to conduct jungle warfare, units must be trained, acclimatized and prepared for it. If not, the jungle itself will be their worst enemy.

- In the jungle, the war belongs to the soldiers and squad leaders more than anyone else, because of the short distances and the difficulties with fire support.

- To gain the natives hearts and minds\(^{108}\) is the key to mobility, to collect intelligence and to some extent also endurance.

- It is important to have air supremacy and be able to use the rivers, due to the considerable advantage to be gained by using helicopters and boats. Also, a big disadvantage for the enemy in not being able to use them.

Keywords: Jungle warfare, Jungle combat, Jungle war, Jungle

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\(^{107}\) Försvarsmakten, *Doktrin för gemensamma operationer*, 2005., p. 61

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Video


**Pictures**


Picture 6: Kopecky, D. (LCI), ‘Jungle from above. Due to the trees the jungle is not suitable for parachute operations’ [Personal photo], taken between year 2008-2011.


