Understanding the Threat Ecosystem: A Concept for Intelligence Support to Special Warfare

A Monograph

by

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2016

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REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

The public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing the burden, to the Department of Defense, Executive Service Directorate (0704-0188). Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to any penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

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1. REPORT DATE *(DD-MM-YYYY)*	2. REPORT TYPE	3. DATES COVERED *(From - To)*
10-05-2016	SAMS Monograph	June 2015 - May 2016

4. TITLE AND SUBTITLE
Understanding the Threat Ecosystem: A Concept for Intelligence Support to Special Warfare

5a. CONTRACT NUMBER

5b. GRANT NUMBER

5c. PROGRAM ELEMENT NUMBER

6. AUTHOR(S)
LTC Douglas W. Zimmerman

5d. PROJECT NUMBER

5e. TASK NUMBER

5f. WORK UNIT NUMBER

7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)
School of Advanced Military Studies (SAMS)
201 Reynolds Ave.
Fort Leavenworth, KS 66027-2301

8. PERFORMING ORGANIZATION REPORT NUMBER

9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)
US Army Command and General Staff College
ATTN: ATZL-SWD-GD
Fort Leavenworth, KS 66027-2301

10. SPONSOR/MONITOR'S ACRONYM(S)

11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for Public Release; Distribution is Unlimited

13. SUPPLEMENTARY NOTES

14. ABSTRACT

The current US Army operating concept, as described in TRADOC Pamphlet 525-3-1, states that the evolving global operating environment contains diverse enemies, employing traditional, unconventional and hybrid strategies that threaten the security and vital interests of the Untied States. In this dynamic and emergent threat environment, the United States National Command Authority will turn increasingly to Special Operations Forces to conduct Special Warfare activates in order to mitigate or eliminate threats before they metastasize. Intelligence support to Special Warfare activities is critical to ensure the effective conduct of these sensitive activities, but the foundations of US Army Intelligence still retain the essence of a Cold War focus, understanding a known enemy who follows known doctrine. The focus on a reductionist approach to intelligence problems, parsing issues into sub-categories, can lead intelligence professionals away from seeing bigger picture patterns and trends. Military intelligence professionals in a complex world with an amorphous threat environment need to understand problems from a holistic approach. Drawing from the discipline of complexity research, this monograph argues that Special Warfare environments, dominated by the human.

15. SUBJECT TERMS
Intelligence, Analysis, Complexity, Complex Adaptive Systems, Insurgency, Operation Iraqi Freedom, Anbar Awakening

16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT	18. NUMBER OF PAGES	19a. NAME OF RESPONSIBLE PERSON
a. REPORT	b. ABSTRACT	c. THIS PAGE			LTC Douglas W. Zimmerman
Unclassified	Unclassified	Unclassified	UU	52	19b. TELEPHONE NUMBER *(Include area code)*

Reset

Monograph Approval Page

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Abstract

Understanding the Threat Ecosystem: A Concept for Intelligence Support to Special Warfare, by MAJ Douglas W. Zimmerman, US Army, 50 pages.

The current US Army operating concept, as described in TRADOC Pamphlet 525-3-1, states that the evolving global operating environment contains diverse enemies, employing traditional, unconventional and hybrid strategies that threaten the security and vital interests of the United States. In this dynamic and emergent threat environment, the United States National Command Authority will turn increasingly to Special Operations Forces to conduct Special Warfare activates in order to mitigate or eliminate threats before they metastasize. Intelligence support to Special Warfare activities is critical to ensure the effective conduct of these sensitive activities, but the foundations of US Army intelligence practices still retain the essence of a Cold War focus, understanding a known enemy who follows known doctrine. The focus on a reductionist approach to intelligence problems by parsing issues into sub-categories, can lead intelligence professionals away from seeing bigger picture patterns and trends. Military intelligence professionals working in a complex world with an amorphous threat environment need to understand problems from a holistic approach. Drawing from the discipline of complexity research, this monograph argues that Special Warfare operational environments, can be better understood in the form of an ecosystem. Therefore, the use of an ecosystem-based intelligence analysis of the operational environment is an effective method to frame the problem set. The Anbar Awakening during Operation Iraqi Freedom is an example of the Special Warfare environment in the 21st Century, and can be analyzed using an ecosystem model to understand the relationships and resource flows between actors. This example demonstrates how an ecosystem framing of intelligence analysis in support of Special Warfare mission sets provides a more comprehensive way to understand the operational environment.

Contents

Acknowledgments

I would like thanking my wife Stori for always being the pillar of support in my life and all my endeavors. I would also like to thank my monograph advisor, Professor Patricia Blocksome for keeping me on task and my seminar leader, COL Charles Lombardo for being the voice of reason and reality. I would also like to thank my fellow students in Seminar Eight for being a constant source of education and inspiration. Finally, I would like to dedicate this monograph to the memory of my mother, Mrs. Sally Reed, who passed away during the writing of the document. She had a lifelong love of learning, and the education of her children was always her highest priority. I hope this monograph makes her proud.

Acronyms

AQI	Al Qaida in Iraq
ATP	Army Techniques Publication
ARSOF	US Army Special Operations Forces
COA	Course of Action
COIN	Counter-insurgency Operations
IPB	Intelligence Preparation of the Battlefield
FARC	Revolutionary Armed Forces of Colombia
FID	Foreign Internal Defense
PMESII-PT	Political, military, economic, social, information, infrastructure, physical environment, and time
MEF	Marine Expeditionary Force
SFA	Security Force Assistance
SOF	Special Operations Forces
SR	Special Reconnaissance
TRADOC	U.S. Army Command and Training and Doctrine Command
TIB	Theater Intelligence Brigade
UW	Unconventional Warfare

Figures

Introduction

> The difficulty of accurate recognition constitutes one of the most serious sources of friction in war, by making things appear entirely different from what one had expected.
>
> —Carl von Clausewitz

Throughout history, those who understand when the paradigm of warfare has shifted and are able to exploit that knowledge change the conduct of armed conflict. Currently, the world appears to be in the midst of such a paradigm shift with the locus of warfare moving away from the traditional nation-state conventional warfare model. In this paradigm shift, unconventional and irregular warfare are becoming a more pronounced and visible phenomena. Unconventional and irregular warfare create new challenges that require a greater depth of information and analysis to derive a practical understanding of the threat environment. Thus the military intelligence community must better understand this emerging environment to be able to inform military commanders on appropriate and effective measures to take when faced with complex types of military challenges.

To better understand this shift in warfare, the nature of paradigm shifts needs to be addressed. Thomas Kuhn discussed the idea of paradigms in his seminal work *The Structure of Scientific Revolutions.* Kuhn defines a scientific paradigm as "universally recognized scientific achievements that, for a time, provide model problems and solutions for a community of practitioners.[1]" This concept of a paradigm can be used to conceptualize the international security environment. The security environment is a common understanding of major powers' interaction, and the consequences of conflicts with and between those powers. Kuhn further writes that

[1] Thomas S Kuhn, *The Structure of Scientific Revolutions,* 1st ed. (Chicago: The University of Chicago Press, 1996), 10.

paradigms can change and these shifts in paradigms occur due to a crisis, wherein the previous understanding has too many contradictions and anomalies to be accepted by the community any longer; it is then discarded for a radically new, shared understanding of the environment.[2] In line with this idea of a radical transition, this monograph argues that the military operating environment is undergoing a paradigm shift, wherein the former idea of stable, state actor-oriented conflict is in crisis, and a new shared understanding of conflict is on the horizon.

The United States (US) Army displays an institutional understanding that there is a paradigm shift occurring, is in the process of trying to identify that shift, and how it will affect the future conduct of military operations. In October 2014, the US Army attempted to translate the perception of a paradigm shift into a proposed operating concept for the Army titled: "Win in a Complex World." The vision of the environment of this complex world states:

> Diverse enemies will employ traditional, unconventional, and hybrid strategies to threaten U.S. security and vital interests. Threats may emanate from nation states or non-state actors such as transnational terrorists, insurgents, and criminal organizations. Enemies will continue to apply advanced as well as simple and dual-use technologies. Enemies avoid U.S. strengths through traditional countermeasures.[3]

In this environment, technology is advancing exponentially and diffusing to all parts of the globe. Thus, creating a more intricate connection between multiple societies and giving small impacts in far-off lands the opportunity to create huge strategic dilemmas. The Army also recognizes environments with multiple actors: friendly, hostile, and neutral, all with distinct agendas and methods for mission accomplishment. In sum, the Army foresees a world dominated by systemic complexity.[4]

A similar environment was described by Chinese Colonels Qiao Liang and Wang

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[2] Kuhn, 90-91.

[3] Army TRADOC Pamphlet 525-3-1, *The Army Operating Concept: Win in a Complex World* (Washington DC, Government Printing Office 2014), 10.

[4] Ibid., 10.

Xiangsui in their book *Unrestricted Warfare.* These Colonels theorize that in a multi-polar world, the old rules do not apply:

> The direct result of the destruction of rules is that the domains delineated by visible or invisible boundaries which are acknowledged by the international community lose effectiveness. This is because all the principles without national power that employ non-military warfare actions to declare war against the international community all use means that go beyond nations, regions, and measures. Visible national boundaries, invisible internet space, international law, national law, behavioral norms and ethical principles have no restraining effects on them.[5]

This emerging complexity paradigm is one dominated by dynamic and adaptable state and non-state actors, sometimes acting in hybrid synergy. The hybrid threat, as noted in Army Doctrine Publication 3.0, is "the diverse and dynamic combination of regular forces, irregular forces, terrorist forces, and/or criminal elements unified to achieve mutually benefitting effects. Hybrid threats combine regular forces governed by international law, military tradition, and custom with unregulated forces that act with no restrictions on violence or their targets." [6]

In US Army doctrine, the concepts of hybrid warfare, conducted by dynamic and highly adaptable forces, are inculcated into the concept of Special Warfare.[7] Therefore, Special Warfare may be the best way for the US Army to address complexity in the near term. The conduct of Special Warfare, consisting of Unconventional Warfare (UW), Foreign Internal Defense (FID),

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[5] Qiao Liang, and Wang Xiangsui. *Unrestricted Warfare: China's Master Plan to Destroy America* (Panama City, Panama: Pan American Publishing Company, 2002), 110.

[6] Army Doctrine Publication 3.0., *Unified Land Operations* (Washington DC: Government Printing Office, 2012), 4.

[7]US Army Special Operations Command, *Counter-Unconventional Warfare White Paper* (Fort Bragg, NC, 2014), accessed January 12 2016, http://www.soc.mil/Whitepapers/28%2010%2014%20UW%20&%20CW%20%20brief%20PAO%20cleared.pdf. "SOF is a logical choice to form the core of a hybrid-structured headquarters to counter IW threats. The unique special warfare and surgical strike capabilities resident in United States Army Special Operations (ARSOF) Forces encompass IW activities. Additionally, ARSOF possess unique expertise in the human domain, FID, UW, and the practical mechanics of working through and with indigenous partners."

Counter-insurgency Operations (COIN), stability operations, Special Reconnaissance (SR), and security force assistance (SFA), gives national decision makers the ability to scale missions and apply flexible levels of force across the continuum of conflict. The ability to tailor responses has the potential to be a powerful tool to protect US interests in this developing security paradigm.[8]

Conceptualizing the underlying issues behind complex problems is critical to the success of any endeavor undertaken in this type of environment. Understanding Special Warfare environments requires a deep cultural and socio-political intelligence depiction. This type of understanding sometimes requires years of interaction to build up a comprehensive knowledge base. Typically, these types of collection efforts are conducted in Phase Zero, or the Shaping phase, which is the period where no recognized state of conflict exists.[9] According to Colonel Brian Pettit, Phase Zero describes "the actions and the environment involved in maintaining US access and influence through foreign engagements with means and methods below the threshold of war."[10] Operations in Phase Zero are heavily dependent on intelligence support to collect, analyze, catalog, and distribute critical understanding of the human terrain. It is imperative that Intelligence professionals understand the interaction of humans with their environment. However,

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[8] Army Training Publication 3-05.1, *Unconventional Warfare* (Washington DC: Government Printing Office, 2013), 1-4.

[9] Joint Publication 5-0, *Joint Operational Planning* (Washington DC: Government Printing Office, 2011), III-42-44. There are six phases of an operation. Shape (Phase 0) is a set of missions, tasks, and actions are those that are designed to dissuade or deter adversaries and assure friends, as well as set conditions for the contingency plan and are generally conducted through security cooperation activities. Deter (Phase I) dissuades an adversary from undesirable actions because of friendly capabilities and the will to use them. Seize the Initiative (Phase II), consists of combat operations to seize the initiative in all situations through decisive use of joint force capabilities. Dominate (Phase III), focuses on breaking the enemy's will to resist or, in noncombat situations, to control the operational environment. Stabilize (Phase IV) operations shift from combat to activities that help reestablish a safe and secure environment and provide essential government services, emergency infrastructure reconstruction, and humanitarian relief. Enable Civil Authority (Phase V) is predominantly characterized by joint force support to legitimate civil governance in theater.

[10] Brian S. Pettit, *Going Big by Getting Small: The Application of Operational Art by Special Operations in Phase Zero* (Denver: Outskirts Press, 2013), 53.

intelligence analysts and collectors in the special operations community, who support special warfare missions, still focus on hierarchical analysis methodologies that over-simplify complex organizations into easily targetable entities. One must understand human environments long before a conflict starts; trying to comprehend the human terrain in the midst of a conflict is a recipe for catastrophe.

The institutional focus on hierarchical targeting is often preferred, as it it allows tactical commanders to use a quick, kinetic option for their complex problem. However, this hierarchical framing of the intelligence problem distorts the picture commanders need to conduct Special Warfare campaigns and rarely helps inform options for long-term solutions to operational problems. This paper argues that the changing paradigm of conflict, one of ever-increasing complexity, is dominated by elusive yet influential human networks, which are constantly adapting and changing to the current environment. Military intelligence methodologies are still trapped in a cold war paradigm of an enemy that stays consistent with a fixed doctrine. However the paradigm of warfare has shifted to one of greater interaction and constant adaptation. Any future success of military intelligence support to Special Warfare preparation of the operational area will require a new way to understand how those environments function and how threats interact with the wider world.

The research question this monograph will endeavor to explore revolves around the intelligence approach to supporting the conduct of Special Warfare activities, such as: unconventional warfare, irregular warfare, or security forces assistance. The doctrinal approach that intelligence professionals use to support improved understanding and awareness across the range of military operations is an outdated concept. Doctrinally, the Army uses the Intelligence Preparation of the Battlefield process to support mission analysis and as an integral part of all US Army operations. This process was designed for a linear battlefield, tends to be reductionist, and assumes much about adversaries and the environment that we do not truly understand. This

monograph examines whether a holistic approach, through a complex systems perspective, is a more effective method in building an accurate intelligence picture and developing a thorough comprehension of problems in Special Warfare environments.

This monograph will utilize a qualitative methodological approach to answering the research question. As Special Warfare environments are complex, with many facets tied to historical, cultural, and local causation, a discussion on the study of complexity and complex adaptive systems is warranted. First, this monograph will attempt to understand the holistic, or all-inclusive, approach to intelligence support for Special Warfare, vice the current doctrinal intelligence methods as reflected by Army Techniques Publication (ATP) 2-01.3, Intelligence Preparation of Battlefield. Second, through a review of complexity literature, this paper will consider a framework to develop an alternative doctrinal application of military intelligence practices for an improved understanding of the Special Warfare environment, which is operational environment in which Special Warfare is conducted. This model will be further explored by using a historical case study to determine if a holistic analysis of the Special Warfare environment is a more effective method for understanding the full intelligence picture. This paper will use a case study that exemplifies the utilization of local surrogate networks defeat a terrorist insurgency. The case study focuses on the local uprising that occurred in the vicinity of Ramadi, Iraq between 2006 and 2009, what was known as the 'Anbar Awakening'. This case study will be used as a modern example of the complexity that Special Operations forces face during Special Warfare missions.[11] The Anbar Awakening is an exemplar for future Special Warfare environments. Assessing this conflict through the lens of a systems-based framework will

[11] Najim Abed Al Jabouri and Sterling Jensen, "The Iraqi and AQI Roles in the Sunni Awakening," *PRISM*, 2, no. 1 (December 2010), 10, accessed March 23, 2016, http://cco.ndu.edu/Portals/96/Documents/prism/prism_2-1/Prism_3-18_Al-Jabouri_Jensen.pdf . This example of the successful use of Special Warfare tactics in recent military history whereby US Army elements successfully enabled the success of the Anbari tribal movement was conducted by a conventional Army unit, the 1st Brigade of the 1st Armored Division.

illuminate whether a new, holistic complexity-based model is an appropriate approach for military intelligence professionals in the future conduct of Special Warfare.

Literature Review

There is a robust collection of literature on the concepts of complexity and complex adaptive systems (CAS). A CAS is the concentration of action and intent within a complex environment akin to that found in the operational environment of Special Warfare. In their book: *Harnessing Complexity: Organizational Implications of a Scientific Frontier*, Robert Axelrod and Michael Cohen describe complex adaptive systems as entity based; this translates well into understanding concepts of human-based interactions in an operational environment. The primary unit in the Axelrod and Cohen framework is the agent, which is a unit, or collection of properties, that has the ability to interact with its environment, including other agents.[12] In a Special Warfare environment, examples of an actor could be a guerilla, an insurgent supporter, a village, the collective membership of an ethnic diaspora, an arms dealer, drug trafficking gangs, transnational terrorist groups, Non-Governmental Organizations (NGOs) or any unit of action that could affect the operational environment.

Paul Cilliers in *Complexity and Postmodernism: Understanding Complex Systems* defines complex systems as occurring when: "the interaction among constituents of the system, and the interaction between the system and its environment, are of such a nature that the system as a whole cannot be fully understood simply by analyzing its components.[13] Ideas of interconnection

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[12] Robert M. Axelrod and Michael D. Cohen, *Harnessing Complexity: Organizational Implications of a Scientific Frontier* (New York: Basic Books, 2001), 4.

[13] Paul Cilliers, *Complexity and Postmodernism: Understanding Complex Systems* (New York: Taylor & Francis, 1998), viii.

are also important for Robert Jervis, who postulates that understanding complex systems by only examining the attributes and goals of interconnected systems is an incomplete approach. Jervis suggests that one must understand the systemic effects of interactions and relationships within systems.[14]

Interconnection and interactions generate complexity. Complexity and CAS present military problems with no complete solutions. The Army doctrinally recognizes that this problem exists. In TRADOC PAM 525-5-500, doctrine refers this type of problem as an ill-structured, or 'wicked problem'.[15] Horst Rittel and Melvin Webber postulated that the classic phased-based systems approach of understanding and adapting to the situation as it develops does not work for such problems: "One cannot understand the problem without knowing about its context; one cannot meaningfully search for new information without the orientation of a solution concept; one cannot first understand and then solve.[16]"

Franklin D. Kramer describes how wicked problem issues often derive from the Special Warfare environment:

> The inability regularly to achieve satisfactory results—a difficulty that we would deem unacceptable in so-called conventional combat—results from a combination of factors, including unarticulated assumptions, substantial deviations between doctrine and practice, and significant gaps in capacities that are often glossed over in planning and execution. Frequently, problems are defined too narrowly, motivations of critical stakeholders misperceived, and complex interdependencies oversimplified.[17]

Military commanders and intelligence professionals need to understand when they are dealing

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[14] Robert Jervis, *System Effects: Complexity in Political and Social Life*, 3rd ed. (Princeton, NJ: Princeton University Press, 1998), 29.

[15] Army TRADOC Pamphlet 525-5-500, *Commander's Appreciation and Campaign Design* (Washington DC: Government Printing Office, 2008), 9.

[16] Horst W. J. Rittel and Melvin M. Webber, "Dilemmas in a General Theory of Planning," *Policy Sciences* 4, no. 2, (1973): 162.

[17] Franklin D. Kramer, "Irregular Conflict and the Wicked Problem Dilemma," *Prism* 2, no. 3 (June 2011), 76, accessed October 30, 2015, http://cco.ndu.edu/Portals/96/Documents/prism/prism_2-3/Prism_75-100_Kramer.pdf.

with an ill-structured or wicked problems in order maintain expectations that there are no tidy solutions in these cases.

Therefore, ill-structured problems, generated from complexity, are the natural habitat of CAS. To understand how CAS impacts military decision cycles, one must understand the physical manifestation of complexity in operational environments: the human network. In Special Warfare, human networks are the primary platform of direct and indirect influence. In the Special Warfare environment, networked threats conduct operations in a distributed manner that Arquilla and Ronfeldt described as 'netwar'. Arquilla and Ronfeldt surmised that the conduct of netwar was a "mode of conflict (and crime) at societal levels, short of traditional military warfare, in which the protagonists use network forms of organization and related doctrines, strategies, and technologies attuned to the information age."[18] This form of warfare is waged by small, dispersed organizations that conduct their campaigns in an interconnected manner.[19] These networks offer unique capabilities in the conduct of militant activities. On the offense, these networks tend to conduct "swarming" operations to overwhelm portions of the opposition and create attrition. However, while in the defense, networks are often difficult to isolate, except for small portions of the network.[20]

Arquilla and Ronfeldt note that there are several important concepts for combatting networks. First, hierarchies historically have a difficult time fighting networks. Second, it takes networks to fight networks; adopting similar design principles as a network may allow for an increased flexibility and adaptability. Third, whoever masters the network form of combat first

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[18] John Arquilla and David Ronfeldt, *Networks and Netwars: The Future of Terror, Crime, and Militancy* (Santa Monica, CA: RAND, 2001): 6.

[19] Ibid., 6.

[20] Arquilla and Ronfeldt, 13.

and best, will gain major advantages in any asymmetric conflict.[21] These networks are often self-organizing and impact their operational environment.

Antoine Bousequet states that networks of agents within complex adaptive systems must be self-organized.[22] The interactions of these self-organizing networks create new emergent properties that are exclusive from the collective efforts, but are not resident in any of the individual agents.[23] Special Warfare utilizes surrogate forces to meet the threats to United States national interests. Utilizing human networks as surrogate forces to combat adversarial networks is an example of how to use netwar in the Special Warfare environment.

Militant networks tend to operate in the seams between areas where elements of national power can effectively bring force to bear upon them. These type of networks can also be referred to as dark networks. Raab and Milward set out specific ideas about dark networks that set them apart from other types of networked organization. As opposed to "bright networks, which deal with legal and overt forms of governance and organization, dark networks maintain a specific destructive capacity, at least to the larger social construct."[24] Raab and Milward bring up an important point in dealing with mitigating the effects of dark networks; you cannot defeat them unless you deal with the underlying causes of their creation. Demand for drugs, popular suppression, social instability, and civil war are all examples of causation for the development of dark networks.[25]

In sum, the literature helps to illustrate the challenges facing intelligence personnel

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[21] Axelrod and Cohen, 15.

[22] Antoine Bousquet, "Chaoplexic Warfare or the Future of Military Organization," *International Affairs*, 84, no. 5, (September 2008): 924.

[23] Axelrod and Cohen, 15.

[24] Jorg Raab and H. Brinton Milward, "Dark Networks as Problems," *Journal of Public Administration Research and Theory* 13, no. 4 (October 1, 2003): 419.

[25] Ibid., 436.

supporting Special Warfare, and argues that the nature of the threat continuum facing US interests, in a Special Warfare environment, needs to be viewed from the systemic perspective. These threats are evolving in an interconnected environment of increasing complexity. The threat agent population and its interaction with the threat environment must be viewed as a CAS in order to predict how environmental changes will affect the composition of the system. CAS generate wicked problems, for which there are no easy answers or infallible predictions. Further, the existence of wicked problems presents multiple dilemmas to any forces trying to counter the activity of the complex adaptive system, and thus gives the agent population in the complex adaptive system the initiative in any conflict. The CAS are personified by networks, and in the Special Warfare environment, dark networks are the platforms of action that will impact the ultimate outcome of any operation or policy.

The Doctrinal Military Intelligence Approach to Framing the Problem

The Army is not using an optimal intelligence approach to deal with complexity, complex adaptive systems, and the networks derived from ill-structured problems. When approaching a military problem, the initial analytical picture will be filtered through 'Intelligence Preparation of the Battlefield'. In Army doctrine, this is the starting point for mission analysis. As the name of the issue suggests, this type of intelligence is best suited for a linear battlefield, and often focuses on tactical problems within large conventional 'force on force' or major combat operations-type conflicts. The conventional aspects of warfare is the foundation of the current military intelligence approach as defined in ATP 2-01.3:

> Intelligence Preparation of the Battlefield (IPB) is the systematic process of analyzing the mission variables of enemy, terrain, weather, and civil considerations in an area of interest to determine their effect on operations. IPB is the systematic, continuous process of analyzing the threat and environment in a specific geographic area.[26]

[26] Army Techniques Publication (ATP) 2-01.3 *Intelligence Preparation of the Battlefield/Battlespace* (Washington DC: Government Printing Office, 2014), 1-1.

IPB is a four-step analytical process. The first step is defining the operational environment, the physical variables that friendly forces must face, through evaluating the weather, terrain, enemy disposition, and civil considerations. This step generates a commander's initial intelligence requirements. The second step, describing the effects on operations, estimates how the variables of terrain, climatic conditions, civil considerations, and friendly forces may impact friendly and enemy operations. The third step is to evaluate the threat or enemy. In this step, the intelligence staff will create a threat model that encapsulates the enemy order of battle, generating a situation template, a capabilities statement, and a determination of the threat high value target list. The intent of this step is to set up the fourth step in the IPB process, which is to develop enemy Courses of Action (COA) based upon known or suspected capabilities. Effective evaluation of enemy courses of action will enable the identification of likely threats or enemy objectives and end states, identify the full set of COAs available to the threat or enemy forces, evaluate and prioritize those COAs, identify threat/enemy high value targets for each COA, and develop initial intelligence collections requirements based on the COAs.

IPB is the foundation of the military intelligence approach to any military operation; this process colors the entire operational planning process and is the foundation of all other Army intelligence activities in support of any particular operation or campaign. Effective IPB will be of great assistance to a commander and subordinate units in the planning process, and poorly executed IPB could lead to a string of errors and misperceptions about the nature of the problem. However, the use of an IPB template may not be appropriate for the conduct of Special Warfare and the complexity that stems from unconventional and irregular styles of warfare. The variables in this type of warfare, and how to address them, expand greatly and may not as be easily described as the threats in major combat operations.

Due to the reductionist approach of major combat operation IPB practices, the conventional intelligence approach to understanding and framing the problems encountered in

Special Warfare is inadequate to analyze complex environments. Although intelligence criteria are quite disparate, there is no doctrinal difference between conventional and Special Warfare IPB processes.[27] Those involved in Special Warfare will be tasked to conduct operations that require a deep and thorough understanding of their target population. Whether it is partnering with allies in a counterinsurgency campaign, a foreign internal defense advise and assist mission, or working with an underground network to overthrow oppressive elements (hostile governments, hostile counter-state groups, local warlords), Special Operations Forces (SOF) soldiers will need comprehensive intelligence products that focus on the human terrain in targeted regions. This type of intelligence support must be flexible and adaptable. Most importantly, intelligence professionals must comprehend and explain the nature of the problem as well as how that problem affects all other elements within the operational area.

At the heart of the issue is the US Army Intelligence community's struggle to find an effective approach for the type of conflicts inherent to the Special Warfare environment. US Army Intelligence activities have historically focused on supporting conventional nation-state based warfare. According to TRADOC PAM 525-5-500 *Commanders Appreciation and Campaign Design*, conventional warfare falls into the category of a 'structurally complex problem'.[28] In this problem set, military professionals will generally agree on the structure of the problem even if they may disagree on the solution. In a structurally complex problem there is a right answer, though there may be significant adaption to find it.[29] The conduct of the World War II, the Korean conflict, and Desert Storm are good illustrations of the US Army approach to structurally complex problems. In this problem, military intelligence personnel are focused on the

[27] Army Doctrinal Reference Publication (ADRP) 3-05, *Special Operations* (Washington DC: Government Printing Office, 2012) 5-1.

[28] TRADOC PAM 525-5-500, 9.

[29] Ibid., 8.

operational puzzle: the location and disposition of adversarial forces, divining adversarial intent, and how weather and terrain affect operations in time and space. This approach to the structurally complex model of linear warfare is completely appropriate and effective for that problem. However, the shortcomings of this type of approach become apparent when applied to non-linear environments.

In this emerging paradigm of non-linear warfare, commanders and intelligence professionals must deal with overwhelming complexity in the operational environment. Intelligence support grounded in conventional warfare has a difficult time transitioning to the environment of non-linear warfare. The training and experience garnered from preparing for conventional threats fosters a counterproductive, reductionist approach to the operational problems faced by special operators.

Thus, this tendency towards reductionism hinders the adaptation of military intelligence practices in analyzing and framing ill-structured problems. Willy Ostreng defines reductionism in the terms of the classical Newtonian ideas that the dynamics of any complex system can be understood from the properties of its parts.[30] This approach is useful as it provides entry points through which a particular phenomenon may be studied and approached for further analysis. The problem with reductionist approaches; however, is that the focus given to understanding the component parts of the phenomenon outweighs the efforts to see how the particulars of the system work as a whole.

Due to the reductionist nature of the IPB process, intelligence professionals spend significant effort on defining how specific environmental effects will impact the use of specific

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[30] Willy Ostreng, "Reductionism versus Holism–Contrasting Approaches," *Consilience. Interdisciplinary Communications 2006* (Oslo: Center for Advanced Study 2005), 12, accessed December 12 2015, http://www.cas.uio.no/Publications/Seminar/Consilience.pdf#page=13.

military systems, the dispositions and order of battle of specific units, capabilities of specific enemy weapon systems and how that impacts the conduct of the specifics of the mission through the lens of the Army war-fighting functions.[31] In dealing with planning for Special Warfare, the IPB process continues to focus on compartmentalizing aspects of the threat through the use of the traditional operational concepts of political, military, economic, and social information, infrastructure, physical environment, and time (PMESII-PT) variables.[32] In this model, intelligence staffs catalog the important factors that could impact military operations in each of these categories. As a result of this type of analysis, there is a tendency for intelligence planners and staff to maintain the compartmentalization of these variables. Often, understaffed and overburdened intelligence elements tend to focus on detailed information about enemy forces and assessed high-value targets at the expense of other characteristics that may have greater overall operational impacts on the environment.[33]

Therefore, PMESII-PT may be the wrong tool for focusing on the systemic interactions found in the threat environment. According to Mark DeMike, a former Deputy Chief of the PMESII Division of the Mission Command Training Center at Fort Leavenworth, Kansas, the "creators of PMESII wanted to target the systems involved with nation building to achieve success."[34] The targeting focus of this methodology creates a trend toward reductionism, so that

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[31] ADP 3-0, 13-14. US Army Warfighting functions are a set of tasks and systems united by a common purpose that commanders use to accomplish mission. Mission Command, Movement and Maneuver, Intelligence, Fires, Sustainment and Protection.

[32] ATP 2-01.3, p.1-1.

[33] Michael T. Flynn, Paul D. Batchelor, Matt Pottinger, "Fixing Intelligence: A Blueprint for Making Intelligence Relevant in Afghanistan", *Voices From the Field* (Washington DC: Center for a New American Security, 2010), 7.

[34] Major Brian Ducote, *Challenging the Application of PMESII-PT in a Complex Environment* (Fort Leavenworth, Command and General Staff College, 2010), 6. ASCOPE is an additional reductionist intelligence tool that focuses on the civilian consideration variables of: Areas, Structures, Capabilities, Organizations, People, and Events. This is a common device for

commanders and staffs can more easily sort out objectives in complex threat environments. As Mr. DeMike further states, PMESII was never intended originally to understand an environment but rather "…to simply identify systems in an operational environment to target."[35]

Further problems with PMESII-PT models are their inherent inconsistencies. As an example, the idea of politically relevant factors is subjective and culturally biased; what one culture or partner nation considers vitally important may be something that Americans consider irrelevant.[36] Focusing on observables, such as easily identified government officials or insurgent commanders, rather than the influence networks of shadow governors or traditional tribal leadership, can result in miscalculations and misunderstandings at critical moments in a mission. Additionally, the variables of physical environment and time are not systems, but effects on systems, which can add further confusion in attempts to build systemic understanding.[37]

The goal of the IPB PMESII-PT process is to generate an assessment of the enemy course of action in the near future. However, the focus on near-term outcomes and fixed starting and termination points for human behavior leads toward determinism, instead of a appreciation of the complex processes and motivations that can drive observed behavior.[38] The trend toward determinism in the adversary's assessed behavior tends to discount probabilistic outcomes and alternative rationalities that afflict environments that are most affected by human activity. Since the human domain dominates the Special Warfare environment, the accuracy of predictive analysis can only be improved though a deep understanding of the human factors and actors in the

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planning Civil Affairs or military activities other than combat operations.

[35] Ducote, 6.

[36] Ibid., 11.

[37] Ibid., 10.

[38] Daniel Javorsek II, John G. Schwitz, "Probing Uncertainty, Complexity and Human Agency in Intelligence," *Intelligence and National Security* 29, no. 5 (2014): 645.

area of operations rather than a focus on determining a threat's near-term objective.

The expectation for future Special Warfare forces is that they will operate in the 'Gray Zone'. The Gray Zone of conflict is defined as: "competitive interactions among and within state and non-state actors that fall between the traditional war and peace duality."[39] This is an environment characterized by legal, social, and moral ambiguity, and uncertainty without the clarity of a formal state of declared war. Unlike major combat operations, a Special Warfare campaign aimed at stabilizing or destabilizing a government or targeted power group, with local partners as the main effort, will focus on the evolution of variables over time and how they impact the overall environment. Pre-combat operational and intelligence preparation of the operational area in the Gray Zone will necessarily be quite extensive before the first US combatants enter the theater.[40] Therefore, the level of detail and understanding required for this type of mission far exceeds the demands of traditional IPB

Understanding the Threat Environment as an Ecosystem

The challenge for intelligence professionals in the current era of conflict is to understand, visualize, and describe the military problems faced in complex environments. To form a systems approach to comprehending the threat environment for Special Warfare, this monograph argues that threat environments should be understood though the interaction of CAS, rather than through the doctrinal IPB processes outlined above. Forming a predictive analysis of how CAS function requires an understanding of how the systemic interactions occur within the environment.

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[39] Phillip Kapusta, "The Gray Zone," *Special Warfare* 28, no. 4, (October-December 2010): 20.

[40] Joseph L. Votel, Charles T. Cleveland, Charles T. Connett, and Will Irvin, "Unconventional Warfare in the Gray Zone," *Joint Forces Quarterly* 80 (1st Quarter, 2016): 103, accessed January 11, 2016, http://ndupress.ndu.edu/JFQ/JointForceQuarterly80.aspx.

David Kilcullen, in his book *Counterinsurgency*, made the statement that insurgencies are organic systems, "in which individual humans and organizational structures function like organisms and cell structures in other organic systems."[41] Indeed, the study of CAS takes much of its ontology from the biological sciences and the study of how living things interact with each other and nonliving things in their environment. This system of interactions is also known as an ecosystem.

Through understanding the form and function of the ecosystem model, intelligence professionals can develop a more holistic framework for comprehending the problems encountered in Special Warfare environments. The basic definition of an ecosystem is: "a biotic (living) community or assemblage and its associated physical environment in a specific place."[42] This explanation was derived from the basic observables in the natural environment and focused around how energy flowed throughout the system and processed inputs and outputs reflected as the cycling of materials in the transformation of energy. John Holland identified four basic properties in any ecosystem that reflect the complex adaptive nature of the structure:

> Aggregation, or the way groups of individuals aggregate into populations, species, and functional groups; the development of aggregate patterns and any hierarchical organizations is a natural result of the self-organization of a complex adaptive system. Non-linearity of ecosystems as result of chance events such mutation or environmental variation; the result of these changes is path dependency whereby the local rules of interaction change as the system evolves and develops. Diversity is fundamental for continued evolution in an adaptive system; but within the maintenance of ecosystems services there are keystone species, whose removal can trigger nonlinear responses that lead to cascades of local extinctions and a fundamental change in the nature of the ecosystems. Flows of nutrients, materials and information characterize ecosystems; such

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[41] David J. Kilcullen, *Counterinsurgency* (New York, Oxford University Press, 2010), 194.

[42] S. T. A. Pickett and M. L Cadenasso, "The Ecosystem as Multidimensional Concept: Meaning, Model and Metaphor," *Ecosystems,* no. 5 (2002): 2. Sir Arthur Tansley, who is widely recognized as the founder of ecosystem theory, developed this definition in 1935.

> flows provide interconnections between parts and transform the community into an integrated whole.[43]

These characteristics show the complexity in natural systems and are also mirrored in human organizational processes and outcomes. These same ideas can be reflected in a framework for an intelligence model to understand human interaction.

In the context of Special Warfare, the adversary is intimately interconnected with its environment, increasing the relative hostility of the system as a whole. In developing an operational picture of the adversary's interconnectivity, intelligence professionals need to look at the overall system as a threat environment. The threat environment is essentially a human construct, populated by sub-systems that are also human constructs. The constructs, networks, and hierarchies are a reflection of human collective activity and can reflect the same rationality, irrationality, and complexity that are seen in individual humans. A natural extrapolation from Kilcullen's thesis, then, is that all actors within the international threat system are higher-level organisms and their interaction with other constructs, both living and non-living, creates a threat ecosystem.

This monograph generates a model for understanding the ill-structure problem of Special Warfare environments using the conceptual lens of an ecosystem to describe the dynamism of the human terrain. The overall characteristics of the operational area are referred to as the threat environment. The Special Warfare threat environment is similar to a biome: a major ecological community of organisms adapted to a particular climatic or environmental condition on a large geographic area in which they occur.[44] The threat environment can contain several threat

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[43] Simon A. Levin, "Ecosystems and the Biosphere as Complex Adaptive Systems," *Ecosystems* 1, no. 5, (1998): 432-3, accessed 22 January 2016 http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.83.6318&rep=rep1&type=pdf.

[44] "Biome" Biology-Online, last modified July 28, 2008, accessed 6 March 5, 2016, http://www.biology-online.org/dictionary/Biome.

ecosystems (as illustrated in figure 1). Though these ecosystems may share some commonalities, each one has unique inputs and outputs due to their interactions with the environment, so each one must be approached in a unique manner. In keeping with the concept of the metaphor, the model for analyzing complex systems in Special Warfare will be based on the Holland ecosystem framework consisting of: aggregation (agent based, self-organized), non-linearity (emergence), diversity, and resource flows (openness, interdependence, and spatial or conceptual boundaries).

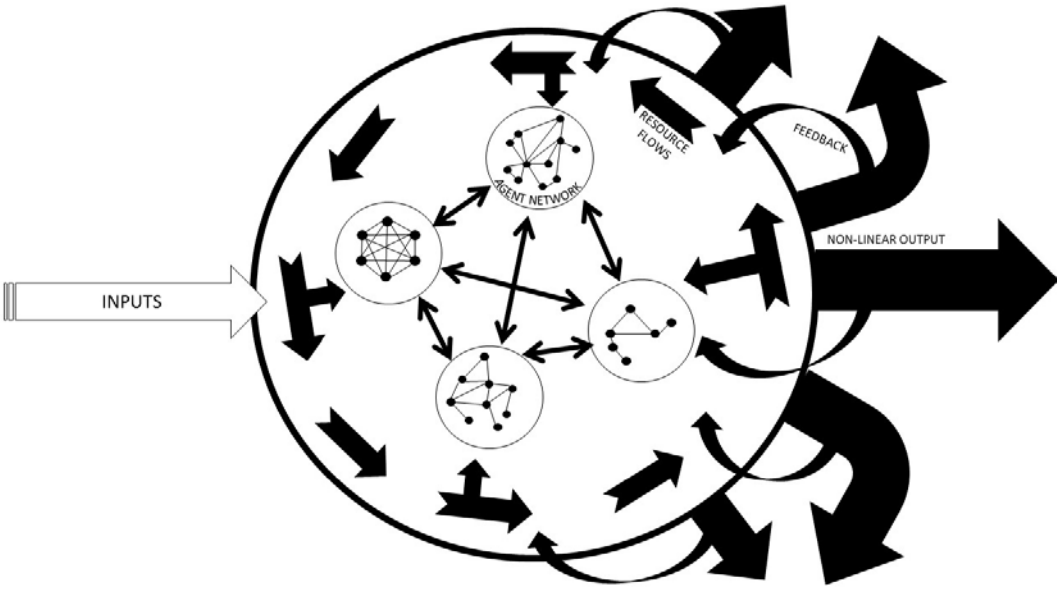

Figure 1: Threat Environment Ecosystem Model

Source: Developed by Author

The first characteristic of the threat ecosystem is that of agency. Threat ecosystems are agent-based and the dynamics of the system are impacted by the aggregation of agents in the system. This agent aggregation creates behavioral patterns in the threat environment, which allows for illumination of individual agent aggregation into greater collective social and operational networks or organizations. The development of these aggregate patterns reflects the

capacity of a complex adaptive system to autonomously self-organize. Agents are not simply mechanized parts of a system process, but individual elements capable of reacting with new strategies or foresight to patterns they have helped create.[45] An agent interacts with its environment, including other agents, and can purposefully respond to what happens around it.[46] Human agency increases complexity because the rational decision-making processes that impact the actions of the agents differ greatly depending on the context and history of the ecosystem. What may seem rational to an agent in one ecosystem may seem totally irrational to an agent or observer in a different ecosystem. As a result, action and reaction may not be easily predictable, thus increasing the non-linearity and emergence of the ecosystem.

The second characteristic of the threat ecosystem is concept of non-linearity. When dealing with a system, one might intuitively expect the system to be linear. As Jervis notes, linearity is often understood though the idea that changes in system output are proportional to changes in input.[47] In complex environments, the system is non-linear and thus, outputs do not correspond proportionally to inputs; the sum is not equal to the components of its parts.[48] There are too many variables and unique circumstances to expect the extrapolated outputs to be the same. Similarly, a small level of financial support for an insurgent or guerrilla group may generate larger effects, such as giving them the ability to conduct a few operations, which in turn,

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[45] J. Stephen Lansing, "Complex Adaptive Systems," *Annual Review of Anthropology* Vol 32 (2003): 194, accessed 10 January 2016, http://www.jstor.org/stable/25064826.

[46] Axelrod and Cohen, 4. An agent can be a person, an organization, a network, a computer virus, it can be anything actor that can impact the processes ecosystem.

[47] Robert Jervis, *System Effects: Complexity in Political and Social Life*, 3rd ed. (Princeton, NJ: Princeton University Press, 1998), 34.

[48] David Waltner-Towes, James J. Kay, Nina-Marie E. Lister eds, *The Ecosystem Approach; Complexity, Uncertainty, and Managing for Sustainability* (New York: Columbia University Press, 2008), 4. As a biological example, one cannot tell the how fast a wetland ecosystem will process water (evapotranspiration) by measuring the process in a potted plant as a sample.

generates a larger volume of local support. Non-linearity leads to novel outcomes; each threat environment is unique. Therefore, attempts to template solutions from one threat environment to another will engender inaccurate analysis, thus leading to different and unforeseen outcomes.

Emergence, is an outcome of non-linearity in the threat environment. The Special Warfare ecosystem is governed by the independent interactions of the plethora of units within the system. From those dynamic interactions emerge outputs that impact the ecosystem and the wider threat environment as a whole. The changing properties of the ecosystem will emerge from those interactions. These properties will be unique to the system; the individual units of the ecosystem also have transformed properties.[49] Emergent properties are the spontaneous outcome of processes and as such are unpredictable; to understand emergent properties, one must understand the processes that generate them.[50] These processes lead to self-organization, which enables decentralized decision-making. This phenomenon leads to the concept that each subset has an identity all of it own.[51] Understanding systemic self-organization focuses attention on how patterns of relationships develop over time in ecosystems and subsystems.[52] As environmental turbulence increases, one may predict how a system will react through its self-organizing relationships. Emergent properties in themselves cannot be measured or analyzed.[53] In Special Warfare scenarios, networks self-organize to ensure security, longevity, and to ensure they have the greatest tactical advantage in order to seize and retain initiative.

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[49] Axelrod and Cohen, 15.

[50] Jamshid Gharajedaghi, *Systems Thinking: Managing Chaos and Complexity - A Platform for Designing Business Architecture*, 2nd ed. (Boston, MA: Butterworth-Heinemann, 2005), 47.

[51] Waltner-Towes, et al, 4.

[52] Ibid., 4.

[53] Gharajedaghi, 47.

The third characteristic of the threat ecosystem model is the concept of diversity. Diversity in natural ecosystems, sometimes called biodiversity, is the variety of genetic code within a given species among a constituent population in a given spatial unit.[54] Diversity is an important factor in the long-term survival of an ecosystem. It allows for better chances of proliferation, adaptation, and survival. As Waltner-Towes notes: "biodiversity is not the property of any one entity. Rather it is an emergent property of a collection of entities.[55]" Levels of diversity are important in threat environment ecosystems as well; different levels of experience and operational capabilities engender the adaptability required for the long-term survival of networks with in the threat ecosystem. These networks require variance, and through interaction and feedback, those agents with the best strategies and approaches to the problem at hand are selected and will foster evolution throughout the ecosystem. Often environmental turbulence can enhance this selection process. In Special Warfare terms, the positive feedback allowing the continued growth of an adversarial organization comes from the diversity of its population, which may include foreign fighters with unique skills and diverse methods of financing to maintain growth and increase influence.[56]

In the biological sciences, ecosystems are bounded by their physical environment, or biomes. In the ecosystem model, biomes and ecosystems function in specific terrains and climates. Physical boundaries can impact how threat networks can grow and limit diversity within their organizations. Historically, physical boundries have limited the growth and sustainability of threat ecosystems. However, the ubiquitous nature of information in the 21st Century have

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[54] Waltner-Towes et al, 85.

[55] Ibid., 85.

[56] David Ignatius, "How ISIS Spread in the Middle East," *The Atlantic Monthly*, October 29, 2015, accessed March 5, 2016 http://www.theatlantic.com/international/archive/2015/10/how-isis-started-syria-iraq/412042/.

mitigated the concept of physical boundaries. Threat ecosystems have become virtually unbounded with the advent of the information age. Hezbollah, a transnational terrorist group that is focused on conflict with Israel in the Levant, conducts activities throughout the physical and virtual world to support their ends of defeating and destroying Israel. Semi-permeable barriers prevent some kind of activities why denying others.[57] Nation-state borders or immigration laws are good examples of this type of semi-permeability, but advanced encryption allowing for the "dark web" on the Internet is another example.[58] This type of semi-permeable barrier has allowed for the threat environment to expand virtually across the globe. The information revolution has changed what is considered agent proximity and the time for agent activation within the ecosystem.

Threat networks can increase their diversity and openness through the virtual world, but their attachment and relationship with their spatial environment is equally important and may ultimately be vulnerability. Regardless of their virtual reach of the threat environment, the focus of threat networks invariably revolves around control of some important physical terrain feature. An example of this terrain could be the creation of the Islamic State Caliphate in areas that nominally are Syria and Iraq, or the maintenance of sanctuaries from which one can attempt to grow and evolve agent networks, like the FARC's control of large portions of Colombian territory in the late 1990s, or Al Qaeda's sanctuaries in Africa's Trans-Sahel region and the Pakistani tribal areas. These physical barriers affect both the spatial and temporal organization of

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[57] Axelrod and Cohen, 81.

[58] Hsinchun Chen, Wingyan Chung, Jialun Qin, Edna Reid, Marc Sageman, and Gabriel Weimann. "Uncovering the Dark Web: A Case Study of Jihad on the Web." *Journal of the American Society for Information Science and Technology* 59, no. 8 (June, 2008): 1347, accessed March 23, 2016 https://lumen.cgsccarl.com/login?url=http://search.proquest.com.lumen.cgsccarl.com/docview/231438828?accountid=28992. This article defines the reverse side of the Web as a "Dark Web," the portion of the World Wide Web used to help achieve the sinister objectives of terrorists and extremists.

the ecosystem. The proximity of agents is directly related to the efficiency of the transmission of information in agent activation.[59]

The final characteristic of the ecosystem model is that of resource flows. Resource flows are significant for the maintenance of agent populations in the threat environment and reflect the characteristic of openness of the threat ecosystem. Ilya Prigonnine clarified the importance of open systems in relation to the ideas of complexity. He states that in open systems with a constant input of high quality energy, the system develops coherent behavior to deal with ever-changing thresholds of output to maintain its structure.[60] The need for the input of energy into the system is constant, which allows the system to self-organize in order to maximize the use of the energy. According to Gharajedaghi, the behavior of open systems can be understood only in the context of their environments.[61] In the ecosystem, openness is a requirement to allow vital energy into the system and also as a way to draw in diversity necessary for adaptation. Turbulence in the delivery of vital inputs from the environment will be a driver for adaptation, as agents within the ecosystem attempt to find ways to buffer instability.

As Kilcullen notes, though the threat ecosystem is generally open to allow for critical flows of personnel, weapons and finances, many of its subsystems within the network are closed.[62] The ecosystem in a threat environment requires constant energy flows (i.e. people,

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[59] Axelrod and Cohen, 79. Axelrod and Cohen discuss the idea of conceptual barriers and semi-permeable barriers, both of which are applicable to the ecosystem model. The conceptual barrier focuses barriers that agents set themselves. Though this concept may include physical barriers, such as national regional boundaries, these can also include ethnic, religious, or cultural barriers as well. Utilizing an ethnic diaspora or international political activist group is a good example using a conceptual barrier.

[60] James J. Kay, "Ecosystems as Self-organizing Holarctic Open Systems: Narratives and the Second Law of Thermodynamics," *Handbook of Ecosystem Theories and Management,* Sven Erik Jorgensen and Felix Muller, eds (Boca Raton: CRC Press-Lewis Publishers, 2000), 3.

[61] Gharajedaghi, 30.

[62] Kilcullen, 195.

weapons and money), but networks within the ecosystem will require secure sub-systems to process that energy into limited outputs (ambushes, assassinations, bombings). The closed aspects of that system buffer attempts by adversarial elements to create turbulence in the system.[63] Due to the relative hostility of their unique threat environments, the agent networks will have varied and novel requirements to conduct work in a clandestine manner to ensure survival.[64] The impact of hostility of the threat environment is either exacerbated or mitigated by multiple feedback loops between the systemic inputs and outputs. Positive feedback loops tend to reinforce and speed up processes, which could lead toward growth, transition, or collapse. Conversely, negative feedback loops slow down processes, potentially leading to greater stability or eventually homeostasis.[65] The constant need for energy input into the open system results in complex systems operating far from systemic equilibrium, making them vulnerable to changes in systemic feedback.

Another aspect of resource flows and environmental openness is the resultant interdependence of its agent networks. Interdependence focuses on the level of interaction between agents in the system.[66] Interdependence levels will govern the speed of change through the system; the more interdependent the communities of agents, the faster systemic change, and adaptation (or extinction), will occur. Axelrod and Cohen postulated that interactions between agents are governed by two factors: proximity, the likelihood that agents will interact, and activation, the sequencing of activity.[67] The idea of proximity is important but fluid. In the

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[63] Kilcullen, 194.

[64] Ian S. Davis, Carrie L. Worth, Douglas W. Zimmerman, "A Theory of Dark Network Design" (master's thesis, Naval Postgraduate School, 2010), 7-8.

[65] Neil E. Harrison, ed. *Complexity in World Politics, Concepts, and Methods of a New Paradigm* (Albany: State University of New York Press, 2007), 4-5.

[66] Harrison, *Complexity in World Politics,* 62.

[67] Ibid., 68.

information age, influence can travel far beyond the proximity of where one can physically meet. Activation addresses the timing of agent activity both internal and external to the system.[68] This concept is important for understanding the speed of changes throughout the system. Agent activation affects how resource inputs are processed into action outputs, or the speed of adaptation in methods and tactics within the threat ecosystem.

Complexity and complex adaptive systems create a challenging environment for the effective conduct of intelligence activities. To better visualize and understand these complex environments, intelligence professionals need a metaphor or an archetype as an anchor for comprehension. The use of the ecosystem framework to stimulate a holistic understanding of the threat may be an effective method for intelligence activities in fluid Special Warfare environments.

The "Anbar Awakening" As an Example of a Modern Special Warfare Environment

The Special Warfare environment is a threat environment wherein US forces are assigned to conduct activities such as unconventional warfare, security force assistance, foreign internal defense, civil affairs operations, and military information support operations. In this daunting threat environment a holistic method such as an ecosystem analysis can provide a richer intelligence picture. The use of the ecosystem model in the Special Warfare environment facilitates an understanding of how to target systemic processes. In ecosystem analysis, intelligence professionals must first identify specific patterns of behavior that organize categories of information and relations.[69] Understanding these patterns will engender the knowledge of how

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[68] Axelrod and Cohen, *Harnessing Complexity*, 69.

[69] Paul DiMaggio, "Culture and Cognition" *Annual Review of Sociology* 23 (1997): 269, accessed 22 January 2016. http://www.ssc.wisc.edu /~jmuniz /culture_ annureview_ dimaggio_ 1997.pdf.

to negatively or positively affect the system's ability to adapt, and can be used as the basis for a systemic influencing process. Using the Holland model of ecosystems one can identify those critical patterns within the system.

This section will examine the Anbar Awakening as an example of a Special Warfare environment, analyzing how US forces recognized the development of an indigenous Iraqi network with allied interests, and successfully partnered with those local surrogates to defeat the Al Qaida in Iraq (AQI) threat network. Although conventional forces effectively combatted AQI in Anbar province, this case study presents an example of the conditions that may exist in a typical Special Warfare environment. In the Special Warfare environment, network-led warfare is the basis of projecting influence and power. This type of warfare favors the small and nimble rather than a large bureaucratic, hierarchical organization. It has been argued that the best way to fight a network is with a network, and in this case, Colonel Sean MacFarland, as the Commander of 1st Brigade, 1st Armored Division, found a network and enabled it to fight[70]. Through his sponsorship of this network and his application of Special Warfare concepts, AQI was defeated in the region.

The insurgency that spawned the Anbar Awakening was a reaction to the power vacuum and instability that racked Iraqi society after the US invasion to remove the regime of Saddam Hussein. The removal of the brutal Hussein dictatorship and its heavy-handed control mechanisms on most parts of Iraqi society created opportunities for negative elements in society to exploit insecurity. Tribal and ethnic groups, which the previous government had brutally kept

[70] Arquilla and Ronfeldt, 15. Arquilla and Ronfeldt coined the phrase "it takes networks to fight networks" in 2002. Their supposition was that governments who wanted to defend against netwar may have to adopt organizational designs and strategies like those of their adversaries. This may mean adopting some of the same organizational principles as a network, or in the case the Awakening, adopt an entire network.

in check, vied for power and sought to resolve long-standing repressed tribal and ethnic conflicts. Complicating the situation was the influx of a foreign-fighter-led insurgency. Out of this complex environment, ethno-sectarian violence emerged between groups of Sunni, Shia, and Kurds.[71] The Sunni tribes took a particularly negative outlook on US intervention in Iraq The Sunnis saw the invasion as an effort to destroy their traditional power, since they maintained a position of privilege in Iraqi society during the Hussein regime, and freely discriminated against the Kurds and Shi'a.[72] 'De-Ba'athification' efforts to weaken the elites that had governed Iraq, particularly the disbanding of the Iraqi Army, eliminated many ethnic Sunni from the power structure, which further alarmed Sunni society.[73] Marine operations in Fallujah, a Sunni-dominated city, gave Sunni populations further concerns that US forces were intent on attacking their interests, and images of weeping women and children broadcasted on the Al Jazeera news network fueled the perception that the US Marines were intent on massacring Sunni tribesmen.[74] Given this perspective on the situation, the Sunnis were in a position where they perceived they had few other options but to fight with whatever allies they could muster.[75]

The environment in post-Saddam Iraq was one of chaos; a power vacuum developed which was filled by battles for power that were inflamed by ancient hatreds, timeless blood feuds,

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[71] Farook Ahemed, *Backgrounder #23: Sons of Iraq and Awakening Forces,* (Washington DC: Institute for the Study of War, 2007): 1, accessed October 25, 2015, http://www.understandingwar.org/backgrounder/sons-iraq-and-awakening-forces.

[72] Kenneth M Pollack, "The Fall and Rise and Fall of Iraq," *Middle East Memo,* No.29 (July 2013), 4. Accessed 12 November 2015 http://www.brookings.edu/research/papers /2013/07/30-fall-rise-fall-iraq-pollack.

[73] Gary W. Montgomery and Timothy S. McWilliams, eds., *Al-Anbar Awakening Volume II: Iraqi Perspectives From Insurgency to Counterinsurgency in Iraq, 2004-2009* (Quantico: Marine Corps University, 2009), 8-9.

[74] Jim Michaels, *A Chance in Hell* (New York: St. Martins Press, 2010), 45.

[75] Pollack, 4.

and boundless ethnic strife. Though US and coalition forces were dealing with violence generated by ethnic networks in all parts of the country, in the western province of Anbar, the Sunni insurgency was proving especially daunting. AQI, a loose network dominated by foreign fighters, was the primary driver of the violent and destabilizing insurgent campaign in this province. The US Marines took on insurgents twice in the troublesome city of Fallujah, but those operations were not able to stop the growth of the network, which formed around a central core headed by Abu Musab al-Zarqawi.[76] From 2004 to 2007, the main effort for the US-led coalition was to arrest the violence in Bagdad, while a number of units conducted supporting efforts in Anbar. During this period, AQI was ascendant within the Sunni population, largely due to the perception from the Sunni tribes that these militants were able to withstand the US Marine assaults in Fallujah and survive. AQI fighters had built up their 'wasta', their reputation as fierce fighters and important men.[77] Coalition efforts in Anbar were flailing and ineffective against the complex and ubiquitous networks of foreign fighters and local insurgents who maintained the initiative in that conflict through 2007.

The insurgent networks were effective at utilizing non-linear tactics, creating large effects with comparatively small efforts. In response to this complex situation, the US 1st Brigade Combat Team, First Armored Division, showed remarkable adaptability and used decidedly unconventional tactics in an attempt to circumvent insurgent intimidation of the population in Anbar's largest city, Ramadi. These tactics included moving combat outposts and patrol bases

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[76] Kimberly Kagen, "The Anbar Awakening: Displacing al Qaida from its Stronghold in Western Iraq," *Iraq Report* (Washington DC: Institute for the Study of War, 2007), 2, accessed 12 November 2015, http://www.understandingwar.org/report/anbar-awakening-displacing-al-qaeda-its-stronghold-western-iraq

[77] William Knarr, Dale Alford, Mary Hawkins, David Graves, Jennifer Goodman, Thomas Jones, Tracy King, Carolyn Lenard, John Frost, Matt Coursey, "DVD Chapter 7. Collection and Analysis," *Al Sahawa – The Awakening: An Education and Training Resource Guide* (Institute for Defense Analysis: Alexandria VA, 2015), 7.

deep into Sunni neighborhoods to develop personal relationships with the population. This tactic was an attempt to both garner information from the populace and to build the legitimacy of the Iraqi government, which most Anbaris viewed with a jaundiced eye.[78] These relationships would be critical in the development of a friendly local network that would later fight against the AQI insurgent network.

Though US and coalition forces were building influence through more conventional means, the development of the Awakening movement, the *Sahwa,* was more an indigenous reaction to the overreach of AQI leaders and associated foreign fighters, rather than any reaction to American counterinsurgency tactics. Zarqawi and his foreign fighters sought to implement a draconian form of Sharia law, which attempted to supplant the more flexible forms of traditional tribal practices. Violations of Al Qaida's Sharia courts entailed harsh sentences and brutal reprisals.[79] Further, AQI's demand that they hold the monopoly on the conduct of violence in the insurgency was deeply unpopular in Anbar. AQI's indiscriminate attacks left many civilians dead or injured, and the targeting of uncooperative tribal leadership networks added to the mounting damage to daily tribal economic life. These extreme forms of coercion were contributing factors to the Anbari Sunni tribes turning away from support of the AQI insurgency.[80] There was widespread discontent with the insurgency, but the tribes were no match for AQI's organization, zeal for violence, and ability to quickly mass fighters against any recalcitrant isolated tribal leader.[81] The situation had become so untenable for the tribes that many Anbaris believed that AQI was secretly working for the US-led Coalition in an attempt to permanently destroy Sunni

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[78] Kagen, 6.

[79] Norman Cigar, *Tribal Militias: An Effective Tool to Counter Al-Qaida and its Affiliates*? (Carlisle Barracks, PA: US Army War College Press, 2014), 8.

[80] Cigar, 9.

[81] Ibid., 9.

tribal culture.[82]

Against this backdrop of hopelessness and self-preservation, the *Sahwa*, or awakening, of the Sunni tribes began to emerge. During this period, the relationships between US forces and the Sunni tribes dramatically changed. The Anbar tribes approached the US Forces and came to an understanding, which built support for efforts to strengthen the local government, improve intelligence sharing, and recruit Anbaris for the local police force; acts which brought massive retaliations against the Sunni sheiks by AQI.[83] The late 2005 AQI offensive against Anbari tribal leadership weakened the local tribal ruling body, Anbar People's Committee, during which nine of the eleven founding sheiks were murdered.[84] This offensive turned out to be the driving force that sped the growth of the Awakening movements.

Sheik Sattar Abu Al-Risha was a mid-level sheik from the Abu Risha tribe, a minor tribe that garnered its primary source of wealth from the black market smuggling of black market bulk oil supplies from the Baji refinery across the border to Syria.[85] Sattar was from a secular tradition in the sheikdom and had been anti-AQI throughout the conflict, as the insurgents were negatively impacting his business. Since many of the richest and most powerful sheiks had left Iraq, the midlevel sheiks grew in influence.[86] Sattar's work with coalition forces had garnered him increasing influence in the province. When one of Sattar's allies, the popular Sheik Khalid Ali abu Jassem, who had developed a close and effective relationship with the Ramadi police chief, was murdered by AQI, Sattar declared war on the foreign terrorist group.[87]

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[82] Knarr, 8.

[83] Michaels, 102.

[84] Ibid., 103.

[85] Ibid., 91.

[86] Ibid., 92.

[87] Knarr, 5-10.

The success of Sattar's efforts to combat AQI, along with several other tribal leaders in Ramadi, was tied to his ability to align the local tribal forces with American forces in the area. This was a critical moment for all sides in the area. The US-led coalition could not defeat AQI or strengthen the local government apparatus without tribal assistance; the tribes required American assistance in keeping AQI off-balance and on the run. The Anbaris, who wanted to make a rapprochement with Baghdad, needed the US to act as the direct conduit, for the regional government was ineffective and inattentive.[88] Though there were issues with trust and confidence on all sides, Colonel McFarland saw an opportunity, despite strong reluctance from his higher command, the 1st Marine Expeditionary Force (MEF), and took the calculated risk in becoming a strong advocate for an alliance with the tribal Emergency Council. Colonel McFarland stated: "somebody had thrown me a floatation device. And Pete [commanding officer of the 1st MEF] was telling me, "Be careful, that floatation device isn't US Coast Guard Auxiliary approved, and it may not hold your head above water." I said, "Who cares. It's better than nothing." I grabbed it and it worked."[89] Due to his understanding of the environment, Colonel MacFarland, through his interactions with the tribal agents, understood that he had an operational opening to utilize local networks. In future Special Warfare environments with similar characteristics, intelligence personnel using a more holistic understanding of the environment can be more adept at recognizing opportunities in the human domain and can provide their commander with essential information to conduct network warfare.

The relationship between the US and the Awakening network started with a focus only on intelligence sharing, which allowed American forces to target AQI with greater fidelity; those successful targeting efforts were reciprocated with local police jobs for the Anbari tribesmen and

[88] Michaels, 106.

[89] Knarr, 5-12.

more local police protection.[90] As Sattar's efforts gained wider tribal influence, the *Sahwa Al-Anbar* (Anbar Awakening) supporters formed a military wing called the *Thuwar al-Anbar* which would hunt down AQI members throughout the community.[91] US Forces allowed and enabled the local militias to address the AQI threats in their neighborhoods, as the *Thurwar al-Anbar* could best identify who was or was not affiliated with AQI. Using Colonel MacFarland as an interlocutor, the Awakening movement garnered further support from the Iraqi government. On October 8, 2006, the Iraqi Minister of the Interior authorized Sheik Sattar to "take all action necessary to exterminate terrorism in Al Anbar Province and to organize two contingent Groups with each counting 750 members in each group in the city of Ramadi. The contingent groups would be called Emergency Response Units."[92] These local militias were strong allies of US efforts in the region and were critical in unifying and protecting the tribal members, thus sapping local support for AQI, destroying local insurgent sanctuaries, and creating support for the Iraqi government. This situation persisted until the eventual withdrawal of US forces.

Though the Anbar awakening was fostered by a conventional unit, the events in Ramadi are representative of the Special Warfare environment, characterized by complex interactions among multiple actors. The next section of the monograph analyzes the Anbar awakening using the Holland ecosystem framework approach of agency, non-linearity, diversity, and resource flows. Through analyzing the threat environment as an ecosystem, intelligence professionals can gain further insights to the connections, patterns, and interactions that impact the operational area.

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[90] Michaels, 135.

[91] Michaels, 139.

[92] Knarr, 5-14.

The Anbar Awakening as a Special Warfare Ecosystem: Agency

In dealing with the complexity of the Anbar awakening, understanding the human terrain, and how the organic agents influence the system, is of critical importance. Within the overall threat ecosystem, the network of agents fell into many subsystems, often bounded by conceptual and geographic boundaries. The vicinity around Ramadi was a fault line of several of these agent subsystems. One subsystem was that of tribal relationships. Within the Ramadi area there are eleven major tribes.[93] The tribes maintained a series of formalized yet byzantine relationships legislating both inter- and intra-tribal contact. Each of these tribes had a series of leaders, or Sheiks, with differing agendas and priorities. Many tribes had extensive and wide ranging commercial ties, some had criminal ties, and others had a combination of the two. Due to Anbar's proximity to the Syrian and Jordanian border, combined with Ramadi's central location along the primary east/west road network, many of the tribes were involved in smuggling. Another system, the AQI insurgency, was not a monolithic force either. Some of the individuals that were connected to the insurgency were tied to nationalist forces, while others were tied to the former regime; there were elements that were part of AQI and others who were just affiliated with AQI while maintaining involvement in local criminal networks. The Iraqi security forces contained agents with differing priorities as well. Local security forces would sometimes find ways to work with local tribes in an attempt to create stability and fight AQI, while ethnic Shi'a politicians who were focused on self-enrichment and ethnic cleansing through the use of the government dominated the higher levels in the Iraqi government and sponsored Shi'a death squads to eliminate many of their Sunni opponents. Many Iraqi Shi'a leaders were taking orders from

[93] Patricio Afsura-Heim, " 'No Security Without Us': Tribes and Tribalism in Al Anbar Province," *CNA Corporation Center for Strategic Studies*, (June 2014), accessed November 14, 2015, https://www.cna.org/CNA_files/PDF/COP-2014-U-007918-Final.pdf. The tribes were: Assaf, Ali Jasim, Risha, Chulayb, Thiyab, Faraj, Alwan, Maral, Soda, Aetha, and Hazim.

Iranian leadership, who were encouraging Iraqi officials to simultaneously cooperate with and attack US forces in Iraq.[94] US and coalition forces added additional agents to the system. Foreign soldiers from the US and Europe did not understand the culture and tended to make mistakes in developing tribal relations. Additionally, western politicians, non-governmental organizations, intergovernmental organizations, civilian contractors, and journalists were active throughout the threat environment; all of these actors maintained separate agendas.

The sheer number of actors involved in multiple subsystems reflected the complexity of the situation in Anbar during this period. But complexity comes not just from the number of actors, but also from their multiple interactions. All the actors described above were bonded through violence, through shared and conflicting interests, through a burning desire for success, political motivations, through personal incentives, and through monetary and commercial connections. These relationships changed dramatically from 2003 through 2010. The Sunni tribes, for instance, initially saw the invasion as an assault against the Sunni power base, which resulted in driving them out of power and reluctantly toward AQI. In desperation, the Anbar tribes felt they needed to find any ally who was willing to fight the coalition as well as the Shi'a campaigns of ethnic intimidation and ethnic cleansing.[95] But AQI and other foreign fighters became the bigger threat, causing the Sunnis to shift relationships to supporting the US efforts in creating patronage networks with the sheiks and generating incentives to develop a common cause against AQI.[96] Awareness through tracking agents and agency in the threat environment is paramount to building an accurate ecological frame of the operational environment. Understanding the patterns of agency in the Anbar Awakening was the key to actualizing how the networks in the region could be used to battle AQI members and increase US Army influence in the region.

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[94] Pollack, 6.

[95] Pollack, 5.

[96] Cigar, 11.

The Anbar Awakening as a Special Warfare Ecosystem: Non-Linearity

Understanding non-linearity informs the impact of resource flows and the interconnectivity of agents on the overall system. Small interactions grew into large events, which changed the nature of the conflict. In the nonlinear threat environment of Ramadi, each attack, through the assistance of media and tribal word of mouth networks, would have a much greater psychological impact. As an example, intimidation of young men who visited police recruiting drives kept the Iraqi government at arms-length and frustrated US Army attempts to develop a better hold on the security situation in the region. This intimidation reinforced the ideas of AQI's power and influence, and showed the international media that the US was impotent.[97] In the information age, insurgencies can use mass media and the Internet to foster and dramatically increase the inherent non-linearity of the complex system.

The non-linearity of a complex system is exacerbated by the local, short-range transmission of information between the networks. In the Awakening movement, local transmission of information was a contributing factor in the development of the insurgency and later, the popular support for the Awakening movement. Sheik Sattar illustrated this localized transmission of information when he remarked about the effective insurgent efforts to persuade locals through a monopoly of information. "They brainwashed people into thinking Americans were against them. They said foreigners wanted to occupy our lands and destroy our mosques."[98] Later, as the residents became more aware of abusive behavior by AQI members towards the tribes, such as the retaliatory executions of tribal leaders and mistreatment of female members of

[97] Knarr, 5-9.

[98] Michaels, 93.

the tribal communities, Anbaris became willing to turn on their former AQI allies.

Intelligence professionals must understand the impacts of non-linearity, as it will affect attempts at predictive analysis. Emergence, which impacts operations, is derived from non-linearity.[99] Understanding that the effects of a campaign might be quite different from the initial conditions is important in preparing adaptability in planning responses. The additive effects of AQI's efforts to intimidate the tribes around Ramadi did not create conditions favorable to the insurgency, but rather engendered non-linear effects leading to the emergence of the Awakening movement. Therefore, intelligence professionals need to understand initial conditions to account for non-linearity.

The Anbar Awakening as a Special Warfare Ecosystem: Diversity

Understanding the nature of system diversity is critical to predicting the resiliency of a system to environmental turbulence. Within the Ramadi system, diversity is represented by the influence of the various Sheiks, the interactions of the tribes, the histories of various family linages, and unpaid blood debts. This diversity is a necessity for this system's resilience, affecting how the elements self-organize, and how they learn and adapt to dynamic situations. The adaptation that came as a result of this diversity is characterized by the learning mechanisms that were inherent in the Awakening council system, whereby the agents collected, transferred, and integrated knowledge into the network.[100] The Anbari tribal system was ideally structured to develop learning mechanisms in order to adapt and succeed in in a complex system. The intricate

[99] Keith L. Green, *Complex Adaptive Systems in Military Analysis* (Alexandria: Institute for Defense Analysis, 2011), 1-5.

[100] Chad C. Serena, *It Takes More Than a Network: The Iraqi Insurgency and Organizational Adaptation* (Stanford, CA: Stanford University Press, 2014) 26-27.

mechanisms of tribal dispute resolution allowed for the robust processing of new information though familiar cultural frameworks.[101] These tribal frameworks also tended to keep information locally processed, ensuring that information was exchanged quickly throughout the tribal system. These resilience mechanisms spawned from the diversity of the Anbari tribal system allowed the agent populations in Anbar province to constantly adapt to survive the Ottoman Empire, the British Empire, movements of nationalism, communism and pan-Arabism, and American occupation.[102] Tribal systems such as those in Anbar province have are time tested for resilience and allow agents to adapt and thrive in complexity. For intelligence analysts and collectors, these types of networks can be a daunting foe or a critical ally in any Special Warfare scenario.

The importance of understanding and utilizing local partnerships in Special Warfare are a crucial element for successfully navigating the human terrain and ultimately understanding the ecosystem. The partnership with the Awakening Council and associated elements was crucial for success in the region, as they knew that area better than the US or even other Iraqis. But the critical element in the *Sahwa* movement was that it was an organic construct, generated from traditional structures the pre-dated the Operation Iraqi Freedom, and even the Ottoman Turkish invasion. Other US attempts, such as the Civilian Irregular Defense Groups in Vietnam or the Village Stability Platforms in Afghanistan, enjoyed only moderate success and required heavy involvement from US forces as sponsors, because these organizations were created to mimic traditional structures, but they were not native to the culture.

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[101] Asfura-Heim, 12-14. Dispute mechanisms included the central node of the Sheik, with the committees of arbitrators, and the utilization of third party decision-making mechanisms to maximize the community framework in the process.

[102] Michaels, 89.

The Anbar Awakening as a Special Warfare Ecosystem: Resource Flows

Military intelligence professionals need to understand how resources flow in the threat environment. In reviewing the case of study of the Sons of Iraq, the Awakening movement displayed the characteristics of an open system. The character of the movement was tied to feedback loops, which either enhanced or mitigated the open flow of resources. As the Awakening movement found more allies in the coalition, the positive feedback loop served to enhance the capabilities of its subsystems, while generating generally negative feedback loops for AQI, limiting their growth and their operational options. There were negative feedback elements for the Awakening movement in the environment as well. Many of the tribal leaders who stood up against the activities of AQI and affiliated elements were often the recipients of great violence. The Abu Risha tribe paid a heavy price in blood, including Sheik Sattar's father and three brothers.[103] This violence was intended by its perpetrators to dampen actions that threatened AQI's influence and might weaken the momentum of the insurgency. Insurgents historically attack civilian defense groups as a lesson to others who consider joining the fight against them, but this tactic more often than not turns local support against the guerilla groups.[104] AQI's attempts to blunt the local support for Awakening movement, the most vital resource flow in an insurgency, instead became positive feedback for the Awakening, enhancing the efforts of the tribes to resist.

Sheik Sattar's alliance with the US was a critical positive feedback mechanism that ensured the *al-Sahwa* movement had a continuous input of resources: money, people, and influence in the region. Another measure of resource flows, representing the openness of the

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[103] Michaels, 94.

[104] Clayton Govinda and Andrew Thomson. "The Enemy of My Enemy is My Friend… The Dynamics of Self-Defense Forces in Irregular War: The Case of the Sons of Iraq," *Studies in Conflict & Terrorism* 37, no. 11 (2014): 927.

Ramadi threat ecosystem, was both the tacit and active support that US forces gave the Awakening Council's militia in their efforts to root out AQI operatives.[105] The Awakening movement's positive feedback, as represented by the increase of popular support for the Awaken council's actions, was inversely related to the negative feedback experienced by AQI. The loss of public support, influence, legitimacy, and most importantly, sanctuary within Ramadi, generated a critical reduction in resources flows to the AQI. The loss of resource flows forced AQI to become more defensive and thus they had to close their subsystems to the environment, which brought their system to near entropy and homeostasis with environment. With no new inputs or energy coming into the AQI system, it was eventually forced to abandon the region.

Intelligence professionals must understand which portions of the threat ecosystem are open and closed. Detailing critical resource flows into the ecosystem will identify which parts of the threat ecosystem need to be open for survival. Once those resource flows are identified, the throughput mechanisms associated with agency in the ecosystem will become apparent and can be aligned with assessed system outputs. The closed portions of the system contain capabilities that networks in the threat environment must protect at all costs, and the use of extensive protective measures make these elements vulnerable to negative feedback. The most important part of understanding resource flow through the networks is identifying critical feedback loops. Understanding how agents learn from their processing outputs and how those outputs help or hinder the system are necessary for informing the commander on possible approaches to the dealing with the threat environment and manipulating feedback loops.

The key point for military intelligence assets supporting Special Warfare activities is the identification of the essential aspects of the threat ecosystem. Resource flows, the relative openness of the environment, the organic agent structures, the non-linearity of the conflict and the

[105] Govinda and Thompson, 930.

resilient diversity within the population are critical to understanding the human terrain. Understanding the characteristics of the ecosystem allows for both targeting threats and identifying possible partners or surrogates in future conflicts. Through utilizing an ecosystem model, intelligence personnel can better understand how to both adapt to complex, changing situations, and what mechanisms are essential to manipulate the agents in the threat environment. This thorough knowledge of the threat environment can enable intelligence to effectively support a network to fight a network.

Intelligence Support to Special Warfare Environments

As the character of the modern battlefield becomes more dynamic and adaptable, the structure and methods of military intelligence support to Special Warfare must accordingly change. This section explores some recommendations for changes in how military intelligence means and methods could better approach complex environments and be able to better understand the networks in the threat environment. This section will briefly discuss the manning and intelligence practices necessary to provide optimum support for Special Warfare activities.

The current force structure and training of intelligence assets in the US Army does not maximize force capability in relation to the understanding of Special Warfare environments. Lack of regional knowledge and capacity are at the heart of the issue.[106]Much of the collection and analysis for this model must be done in pre-conflict, or Phase Zero environments, for months and

[106] Whitney Kassel "The Army Needs Anthropologists" *Foreign Policy*, July 28 2015, accessed March 23, 2016, http://foreignpolicy.com/2015/07/28/the-army-needs-anthropologists-iraq-afghanistan-human-terrain/. With the loss of the Human Terrain System, there is no current large-scale effort to integrate information about the human terrain in to military databases. Military Intelligence activities will need to replicate these efforts in Special Warfare environments.

sometimes years before any necessity to conduct of operations in the environment arises. Currently, the small number of intelligence assets supporting a few, specialized units, are regionally aligned to do this well. But intelligence analysts and collectors are not stationed with these elements long enough to garner the in-depth regional knowledge to be effective in these environments. The same could be said for intelligence analysts and collectors at Theater Intelligence Brigades (TIBs). When assigned to such a role, these intelligence soldiers have no specific geographic or demographic expertise to understand the threat environment. By the time intelligence professionals acquire the necessary background, they are often moved to another assignment, which may not require geographic or demographic expertise, or may require expertise in a different region.

In order to maximize the intelligence support to units dealing with any number of global threats, intelligence analysts and collectors should be regionally aligned from the time they enter the Army. Under this concept, intelligence professionals would undergo region-specific language and cultural training throughout their career to build expertise. As they are assigned to units, they become responsible for developing regional databases on specific agents, networks, and regional resource flows in order to build environmental understanding.

Additionally, current US Army structure places a preponderance of intelligence personnel at Corps or operational level staffs. This arrangement keeps intelligence analysts separated from the operational environment and weakens their immediate cultural knowledge. To understand the complexity of the environment and to be able to identify the systemic connections of the Special Warfare ecosystem, intelligence professionals need to deploy forward, into, or near the threat environment to improve systemic understanding. This will require a greater preponderance of intelligence personnel be assigned to tactical units with habitual regional relationships.[107] Only

[107] This is only effective as long as a General Purpose Force unit remains aligned to the

through spending a great deal of time on the understanding of the intricacies of the various threat ecosystems within a specific region will intelligence analysts and collectors develop a better sense of the resources flows of the environment, the feedback loops, the historical interactions of the agents and the adaptive diversity of the system. This level of understanding enables the effective use of predictive analytical products to give the commander a sense of the best application of military force to impact the structure and function of the ecosystem.

Outside of regional alignment, some intelligence personnel should also be threat-aligned. Having expertise in specific in specific threat groups, such as Hezbollah or Al Qaida, will allow for a fuller understanding of trans-regional threat ecosystems. Building specific expertise in subject matters such as terrorism finance, pandemic tracking, cyber-threat intelligence, weapons intelligence, and knowledge management will increase effectiveness in understanding resource flows and how to manipulate or develop feedback loops. Again, this will require that the US Army change the ways in which intelligence personnel are assigned, by creating technical specialties with the intelligence branch. This course of action will create greater specialization, but may impact the number of generalists. Another alternative is to train the generalists in specific technical areas and give them a unique identifier in addition to their MOS, which would allow them to hold specific technical positions as necessary.

In order to understand how to visualize the threat environment, analytical training will also need to change. One area on which intelligence professionals could focus on, is the concept of the boundaries of the threat environment, as that will have an immediate impact on planning and infiltration into the ecosystem. Beyond the physical aspects of the area within the boundaries of the threat environment, intelligence analysis needs to account for conceptual boundaries as

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same region. Regional apportionment precludes the long-term collection of regional data and unit familiarization with distinct and novel local factors. At the tactical level, only Special Operations Forces units such as Special Forces Group, Military Information Support Groups, or Theater Intelligence Brigades are regionally aligned.

well, to understand the proximate reach of agents within the ecosystem. The physical boundary analysis should include the idea of semi-permeable barriers that surround the ecosystem to approximate the free flow of resources and communications. These semipermeable boundaries would include the impacts of any traditional nation-states, banking rules and bureaucracies, security forces control measures, and anything that impacts the open nature of the network and force the adoption of clandestine measures to protect the functions of the ecosystem. This first step of defining the openness of the system identifies the constraints on the resource flows of the ecosystem that may be exploited.

Training of intelligence personnel should further focus on the skills to identify, understand, and visualize agency in the environment. A significant training regimen to change the foundations of the military intelligence methodologies will be required to improve adaptability. To have a holistic view of the environment there is a requirement for understanding the nature of agency within the ecosystem. Since complex systems are agent-based understanding how those agents are arrayed in the ecosystem is critical for any analysis. Agents can be any actor that interacts with the ecosystem and the other agents within the environment, including individual persons, an organization, a network, or any other element that proactively works in the system and impacts the environment. Intelligence must understand the agents in the network, map the layout of those networks, and identify who the key agents are within networks who might need to be targeted or protected. Through proactive agent mapping, intelligence professionals may be able to predict agent activation to assess how networks and the ecosystem will be impacted by turbulence in the environment. Such training in human domain intelligence analysis could consist of extensive training in human intelligence data management, training, and development of social network analysis skills, social media analysis techniques, education in demographics, and social movement theory.

To be able to understand and visualize the ecosystem, intelligence professionals must

also have access to robust data sets. The methods and means of databasing and analysis will also require reexamination. In order to understand and adapt to the environment, collection, and analysis must be moved away from the theater level of operations and to the tactical level. The current databases must be redesigned or replaced with a process that allows for intelligence professionals to easily input data into a centralized data based from any location within an area of responsibility.[108] The ability to collect and quickly synthesize human intelligence collected from the field—including demographics, field debriefings, and interrogations, and feeds from unmanned reconnaissance vehicles—into the overall intelligence cycle is critical for understanding network structure and agency in the operational environment. This flattening of the intelligence cycle will increase the ability to understand and adapt to quickly changing environments.

Conclusion

The conflict environment faced by the US Army is in the process of a paradigm shift, and the future face of warfare may look very different from the current threat paradigm. Preparing for the old paradigm of major combat operations will not prepare the US Army for the future paradigm where threats will consist of a continuum, from nation states down to transnational terrorist groups to individual cyber-enabled anarchists. The future threat environment will be one of great complexity due to the vast interactions of human networks, and as such, will be non-linear and difficult to predict. The US Army needs to rethink the foundations of its intelligence doctrine and structure in order to meet and deal with this future threat environment.

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[108] "About DCGS-A" DCGS-A Homepage. Last modified November 9, 2015, accessed March 23, 2016. https://dcgsa.army.mil. The current system used for databasing intelligence information from battalion to Theater level of operations is the Distributed Common Ground Station – Army (DCGS –A). This system is intended to integrate intelligence functions through combining stove-piped legacy applications into one comprehensive network.

The US Army must look beyond traditional Cold War models of understanding and predicting the threat environment. IPB and the related process of PMESII-PT are methodologies than lend themselves to dealing with known threats that operate under an understood doctrine. This type of intelligence practice is not effective in support of Special Warfare missions such as Unconventional Warfare or Counterinsurgency campaigns. Instead, Special Warfare practitioners must have an environmental understanding which details how component parts of the threat environment interact with each other on many levels. This environmental understanding will generate a more holistic picture of the adversarial elements and produce more accurate predictive analysis.

An alternative to IPB is the concept of the Specal Warfare ecosystem, which offers a different model to make sense of operations in complex environments. The model's development is necessary due to the shortcomings of the IPB process to illuminate the many facets of the Special Warfare threat environment in the mission analysis process. In the current age of expanding threat environments and shrinking defense budgets, SOF will be increasingly needed to impact threat ecosystems.[109] Special Forces operators conducting missions to support or destabilize networks and ecosystems in the threat environment have a high requirement for socio-cultural information to better to understand and visualize the ecosystem. These operators and their enablers will be immersed in the threat environment and will themselves become agents in the system. They need to understand the agency interactions, systemic non-linearity, diversity, resource flows, input and output mechanisms, the boundaries of the ecosystem, and systemic feedback mechanisms. In order to defeat or support networks in the system, intelligence professionals will need understand and visualize the levers of turbulence within the ecosystem

[109] As the US Government expands operations overseas with fewer resources, US Army Regionally Aligned Forces and Marine Corps elements may also find themselves dealing with missions that increasingly resemble those conducted Special Warfare. The ecosystem model may be a tool to assist conventional forces in understanding and adapting to the complex missions.

and attempt to predict how those agents will adapt to turbulence.

This monograph examined the case of the Anbar Awakening as an example of the complexity that is endemic in the Special Warfare environment. Dynamic situations, in which US forces must work with indigenous allies from alien cultures, are daunting environments for intelligence professionals to engage in predictive analysis. The concept of an ecosystem provides a method to reflect on the holistic interaction of self-organizing, agent-based networks in non-linear, diverse, interrelated systems involved in the Special Warfare threat environment. Intelligence professionals can utilize the idea of a Special Warfare ecosystem to identify what parts of the system are vulnerable to manipulation in support of the Special Warfare mission.

In sum, the paradigm of warfare is changing. The nature of warfare will be increasingly dynamic, complex, and rapidly adaptable. The increasing interconnectivity across the globe offers threats new and novel methods for adversaries to organize for action. Military intelligence will be required to understand the evolving threat environment and advise commanders and policy makers how best to defend the national interest in this new paradigm. Analyzing the threat environment through the metaphor of an ecosystem may be an effective method through which to understand the interconnectivity of agents, the non-linearity of the system, diversity of the networks, and the open or close flow of resources. Through visualizing threat environments as threat ecosystems, intelligence professionals may derive the perspective to assess and predict future actions of adversaries. Going forward, intelligence structures and methods must have the the ability to adapt, just as the threat adapts. Military intelligence must reflect the idea that it takes a network to fight a network.

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